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# LIVERPOOL BAY CCS PROJECT

## POINT OF AYR GAS PLANT
Point of Ayr Terminal

## PoA Cable Route and Foreshore Works CEMP

| | 05 | 09/10/2025 | FOR APPROVAL | A. Billington | L. Gherbi | | | c |
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**HOLD RECORD**

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## 1.0 INTRODUCTION

### 1.1 Scope of Document

This Construction Environmental Management Plan (CEMP) has been prepared in relation to the Point of Ayr (PoA) Cable Route Foreshore Works Proposed Development ("the Proposed Development").

The Proposed Development comprises a realignment of the cable route consented PoA Terminal and Foreshore Works ("the Consented Development") that was granted planning permission in May 2024 [**FUL/000246/23**] by Flintshire County Council (FCC). The Consented Development comprises new infrastructure and modifications to existing facilities at the PoA Terminal in Flintshire to operate with carbon dioxide ($CO_2$).

This CEMP sets out the site-specific control measures for the HDD and the cable lay activities associated with the Proposed Development for which planning permission is sought. These works comprise installation of a combined fibre optic and electrical cable from Warren Farm, under Gronant and Talacre Dunes, and across the intertidal area of Talacre Beach to the mean low water springs (MLWS) line. The cable will be installed under the dunes via a conduit that will be constructed using a trenchless method of horizontal directional drilling (HDD). Across Talacre Beach, the cable will be pulled ashore before being buried by means of cable trencher, plough or with excavators.

A separate CEMP has been prepared in support of the Consented Development [**FUL/000246/23**]. All REAC References are complied with in full for the different control and management that will be implemented during the execution of the Proposed Development in relation to the scope of the document at the valve location (the HDD Entry Pit).

### 1.2 Aim and Objectives

The aim of this CEMP is to ensure that the works outlined in this document do not result in unacceptable environmental effects. It will set out how the works will be managed to reduce, avoid and mitigate adverse effects. In particular, the CEMP shall:

- Provide a mechanism for ensuring that measures to mitigate potentially adverse environmental effects are implemented;
- Provide assurance to third parties that their requirements with respect to environmental performance will be met; and
- Provide a framework for compliance auditing and inspection to enable the Project to be assured that its aims with respect to environmental performance are being met.

### 1.3 Statutory Guidance and Best Practice

Access to this CEMP will be provided to each person working on behalf of the Principal Contractor. The Principal Contractor will maintain a copy of the CEMP at all work site offices for reference by the entire workforce. It will be accessible to all site personnel and representatives of the relevant enforcement Authority, and all Subcontractors. All site works shall be undertaken in compliance with this CEMP and with all applicable legal and regulatory requirements. The Principal Contractor will take responsibility that their works do not contravene legal requirements, and adherence to this CEMP alone cannot be a full defence regarding legal action against the Principal Contractor.

The Principal Contractor shall comply as necessary with the Construction (Design and Management) Regulations 2015 (CDM) and shall comply with all the applicable pollution control regulations in which case the Principal Contractor shall obtain and keep current any necessary consent, authorisation, approval or permission.

The Principal Contractor shall, where relevant, undertake all site works in accordance with current guidance and best practice.

### 1.4 Environmental Management System

This document has been produced in accordance with principals outlined in BS EN ISO14001:2015. The Principal Contractor will mirror the Liverpool Bay CCS Limited environmental values and standards including the promotion of these values and standards among their staff, subcontractors, and suppliers engaged on the works. The Principal Contractor appointed to the works can demonstrate the principles of BS EN ISO 14001:2015 and has an Environmental Management System (EMS) certified to the standard.

## 2.0 DEFINITIONS AND ABBREVIATIONS

### 2.1 Definitions

| Term | Definition |
|---|---|
| **Company** | The party that initiates the project and ultimately pays for its design and construction i.e. ENI UK Ltd will generally specify technical requirements. The term "COMPANY" also includes agents or consultants authorized to act for, and on behalf of, COMPANY. |
| **Contract** | An acceptance of legal relations between two or more parties for the transfer of goods or services for value. |
| **Contractor** | A person or organization that undertakes responsibility for the execution of a contract. |
| **Subcontractor** | Any person to whom performance of any part of the Works, including engineering works or supply of any Equipment, is subcontracted directly or indirectly by the Contractor and including Approved Subcontractors and legal successors or permitted assigns. |
| **Supplier** | The party (Manufacturer or Vendor) that manufactures or supplies equipment or services to perform the duties specified by the Company or Contractor |

## 3.0 REFERENCES

This CEMP makes reference to, and should be read in conjunction with the following documents:

### 3.1 International Codes and Standards

[Ref 1] ISO 45001 Occupational health and safety management systems, Requirements with Guidance for Use

[Ref 2] ISO 14001 Environmental Management Systems - Requirements with Guidance for Use

### 3.2 Project Documents

[Ref 3] TCPA [Ref. FUL/000246/23] – March 2023 T.4 Environmental Statement

[Ref 4] TCPA [Ref. FUL/000246/23] – March 2023 T.5.3 Register of Environmental Actions and Commitments

### 3.3 Legislation references

- Clean Neighbourhoods and Environment Act 2005
- Conservation of Habitats and Species Regulations 2017
- Construction (Design and Management) Regulations 2015
- Control of Asbestos Regulations 2012
- Control of Noise at Work Regulations 2005
- Control of Pollution (Oil Storage) (England) Regulations 2001
- Control of Pollution Act 1974
- Control of Substances Hazardous to Health (COSHH) Regulations 2002

- Control of Vibration at Work Regulations 2005
- Countryside and Rights of Way Act 2000
- Countryside and Rights of Way Act 2000
- Environment Act 1995
- Environmental Damage (Prevention and Remediation) Regulations 2015
- Environmental Permitting (England and Wales) Regulations 2016
- Environmental Protection Act 1990
- Floods and Water (Amendment, etc.) (EU Exit) Regulations 2019
- Hazardous Waste (England and Wales) Regulations 2005
- Land Drainage Act 1991
- Local Biodiversity Action Plans (LBAPs)
- Noise and Statutory Nuisance Act 1993
- Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001 and (as amended) 2005.
- Personal Protective Equipment at Work Regulations 1992
- Planning (Listed Buildings and Conservation Areas) Act 1990
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017
- Town and Country Planning Act 1990
- Town and Country Planning Act 1990
- Waste (Circular Economy) (Amendment) Regulations 2020
- Waste (England and Wales) Regulations 2011
- Waste Batteries and Accumulators Regulations 2009
- Water Act 2014
- Water Environment (Water Framework Directive) Regulations 2017
- Water Industries Act 1991
- Water Resources Act 1991
- Weeds Act 1959
- Wildlife and Countryside Act 1981
- Wildlife and Countryside Act 1981 (Prohibition on Sale etc of Invasive Non-native Plants) (England) Order 2014

## 4.0 CONSTRUCTION ACTIVITIES AND PROGRAMME

### 4.1 Project Location and Description

The works subject to the new TCPA application submitted in August 2025 comprise the installation of an underground section of Horizontal Directional Drilling (HDD) conduit under Gronant Dunes originating from the HDD Entry Pit (consented under **FUL/000246/23**), to a buried HDD Exit Pit near the Mean High Water Spring (MHWS) line, and burial of a combined electrical and fibre optic cable across Talacre Beach to the Mean Low Water Spring (MLWS) line.

The new underground cables will be installed broadly in a north-northwest direction from the HDD Entry Site to the MLWS. The cables will be buried on Talacre Beach from the HDD Exit Pit to the MLWS and onwards to a new offshore platform in Liverpool Bay.


**Figure 4.1: Site Location and Red Line Boundaries**

### 4.2 General Site Arrangements

#### 4.2.1 Temporary Construction Compound

Temporary Construction Compounds are planned at:

- Main site: Warren Farm: Main compound - HDD entry and cable installation works.
- Beach: Satellite compound – HDD exit and cable installation works.
- Talacre Car Park: (un)loading of larger equipment and crew parking.

Access to the Foreshore works will be from the Talacre Beach car park and along the base of the dunes via the route identified and consented under **FUL/000246/23.**

### 4.2.2 Site Set Up and Compound

The site set up works shall include the establishment of secure site access, works signage, dedicated laydown area(s) and construction compound. The compound shall be set up in accordance with the Client's Health Safety and Environment (HSE) policy and procedures if available. Full details can be obtained by reference to this CEMP, however, as a minimum, this will include the display of:

- Site Information / Services Plan.
- Traffic Management Plan.

### 4.2.3 Fencing and Site Security

All work sites will be securely fenced or otherwise demarcated from public access. All fencing and hoarding will be suitable, taking into considerations, typically 'post-and-rope' fencing for arable land or appropriate stockproof fencing for grazed land. Urban sections or areas with increased levels of public interaction may use HERAS or similar. All temporary fencing will be removed upon completion of the works.

At the beach demarcation from public assess is not practical due to the intertidal environment. Barriers placed within the intertidal area may come loose due to tide and become pollutant and risk for shipping. Site marshalls will keep an eye out on public and divert them and/or stop the works when too close in vicinity.

Physical screening of the working areas would only be employed where necessary to minimise disturbance to wintering birds.

### 4.2.4 Welfare Facilities

Welfare facilities will be made available at the Construction Compounds. Welfare facilities may be shared between work sites where there is more than one compound in close proximity to minimise the construction footprint. The following welfare facilities will be provided on site:

- Toilets and Washing Facilities - hand wash basins are provided
- Drinking Water – To be provided during execution at suitable locations (considered bottled drinking water or a water-maker to be supplied by catering Subcontractor)
- Changing rooms and Lockers – Provided for Contactor and Company personnels only within the office buildings.
- Rest Facilities: A dedicated room for resting is provided in the Contractor office. Additionally, in the Company office and TOF building, extra seating arrangements have been included in the pantry room.

For Subcontractor personnel, only mess hall seating facilities have been considered. All other facilities related to Subcontractor personnels should be managed independently by the Subcontractor.

## 4.3 Working Hours

Where practicable, all works will be undertaken during daytime hours from Monday to Friday (08:00 to 18:00) and on Saturdays (08:00 to 13:00). A shoulder hour on either side of these times will be proposed for start-up

and close-down activities such as but not limited, to arrival and departure of workforce, site briefings, inspections and safety checks, clean-up, maintenance (non-noisy) and refuelling.

The preparation works, including ground preparation, welfare, and fencing at Warren Farm and the beach area, are scheduled to take place on a 12-hour per day, 6 to 7 days per week basis. However, certain activities will require 24-hour operations throughout the week due to tight scheduling constraints related to tidal constraints on site access, minimise overlap with wintering bird season, and the intention to complete before the Easter holiday, which necessitates a more condensed timeline. This approach also helps address potential delays from high tide and aims to optimise operations while minimising disruption during sensitive periods for the little Tern population.

Drilling activities must be conducted continuously, as interruptions may lead to the drilling head becoming lodged and potentially leading to tunnel collapse. This could result in abortive work and the necessity to begin a new conduit separate from the original alignment, thereby extending the duration and impact of the HDD drilling. Demobilisation of HDD is expected to occur on a 12-hour per day schedule.

For the cable mobilisation and cable installation works on the beach, this also needs to be carried out 24-hours per day. This is due to the tidal environment by which progress is limited per shift. Mobilisation, preparation and demobilisation at Warren Farm will be however attempted to be limited to 12 hours per day.

A typical shift time for 24 hour working is from 07:00 to 19:00, and 19:00 to 07:00. Therefore, during these periods of the works, 24-hour access, and egress, is required.

It is anticipated that HDD conduit construction will commence in February to April 2026, which is outside of the Little Tern breeding season. The cable shore pull, and simultaneous lay and burial, by the cable laying vessel, are scheduled for July 2026 at the end of the Little Tern breeding season, close to their migratory departure. LBCCS will continue to work with its cable installation contractor to, as far as is reasonably practicable, sequence these works to occur either later in, or after, the breeding season.

### 4.4 Consents and Permits

**Table 4.1** shows the licenses, consents, planning and permits applicable for this project. Copies of these will be retained on site.

**Table 4.1 Consents and Permits**

| Licenses / Consents / Permits | Authority | Reference Number | Relevant Section (for conditions) | Responsibility |
|---|---|---|---|---|
| Town and Country Planning Permission | Flintshire County Council | [FUL/000000/25] & FUL/000246/23 | CTMP- Condition 5 | LB CCS |
| Marine Licence | Natural Resources Wales | CML2365 | Notifications as per 3.1. and 3.2 | LB CCS |
| Written notification of the date of commencement of any works on the site | Flintshire County Council<br><br>Natural Resources Wales | [FUL/000000/25] & FUL/000246/23<br><br>CML2365 | Condition 2<br><br>Notifications as per 3.1. and 3.2 | LB CCS |

| Licenses / Consents / Permits | Authority | Reference Number | Relevant Section (for conditions) | Responsibility |
|---|---|---|---|---|
| Written notification of the date of the material start of each phase of development | Flintshire County Council<br>Natural Resources Wales. | TBC | Condition 2<br>Notifications as per 3.1. and 3.2 | LB CCS |
| CEMP approval | Flintshire County Council<br>Natural Resources Wales | [FUL/000000/25] & FUL/000246/23<br>CML2365 | Condition 8<br>Condition 3.25 | Principal Contractor / LB CCS |
| Biosecurity Risk Assessment and Method Statement | Flintshire County Council<br>Natural Resources Wales | [FUL/000000/25] & FUL/000246/23<br>CML2365 | Condition 17<br>Condition 3.25 | Principal Contractor |

## 4.5 Description of the Horizontal Directional Drilling (HDD) activities

### 4.5.1 Overview of HDD Method

The installation of the cables under the Gronant Dunes will utilise HDD equipment, see **Figure 4.2** for a schematic overview. This technique will be used to avoid causing disturbance to the ground surface, and disturbance to the ecologically sensitive dune system. The HDD process involves drilling a tunnel from an entry pit behind the dunes to an exit pit located just below the MHWS line.

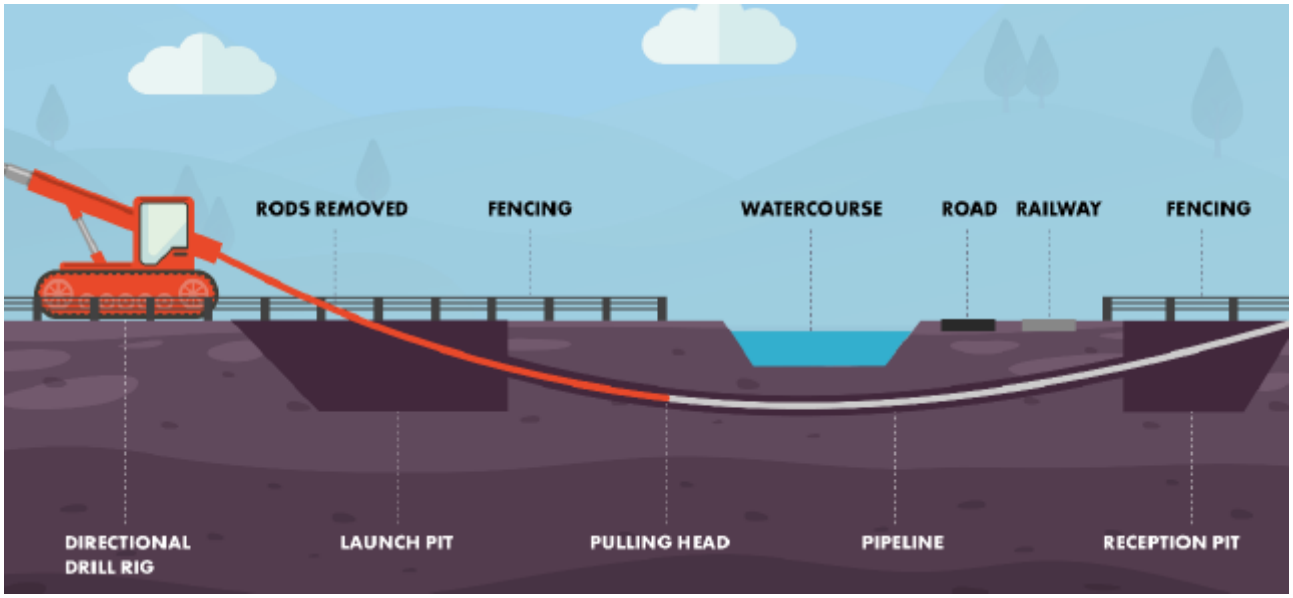


**Figure 4.2: Illustration of HDD technique for cable installation**

HDD operations are undertaken from two sites, an entry site and an exit site, this is further explained upon within the next paragraphs. Talacre car park is used as (un)loading of larger equipment and crew parking. **Figure 4.3** shows the indicative locations of these sites.

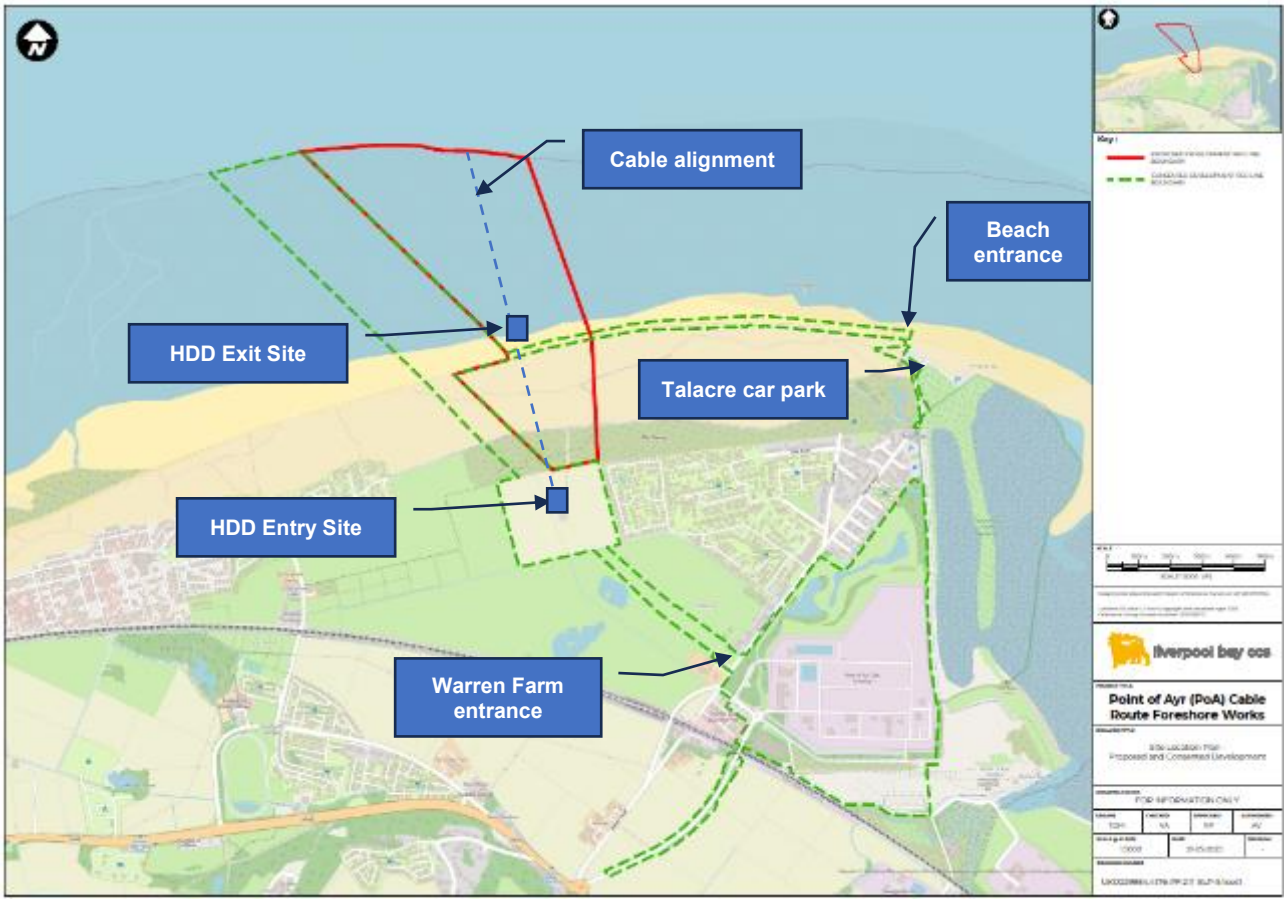


**Figure 4.3: Talacre; indicative locations of the HDD sites, Entrances and Car Park**

### 4.5.2 HDD Entry Pit Establishment

The entry site is the main works area for HDD. A temporary road way, with e.g. road plates, will be required to provide safe access from the farmers yard at Station Road to the valve field where the existing pipeline is located. This entrance is visualised at **Figure 4.3** as 'Warren Farm Entrance'. At Warren farm entry is made towards the HDD entry site. Temporary matting is planned across the fields for the transports. Some levelling may be required by excavator or dozer.

**Figure 4.4: Typical temporary matting**

At the Entry Site, ground preparation will be performed and consists of temporary matting, and a rock layer. These layers not only support (heavy) equipment, they also prevent the working area becoming a muddy working area. The areas are detailed below, and shown in **Figure 4.5**, and **Figure 4.6**.

- Temporary matting (yellow boundary below) is placed on site to support welfare, storage containers and other reasonably light equipment that cannot be stored on grassland. This matting will be similar to the matting as used for the temporary access road to Warren Farm.
- Rock layer (red boundary below) is placed on site to support the heavy HDD equipment (see for visualisation **Figure 4.5**). To do so, the top soil will be removed and stored in between the site compound and caravan park – possibly acting as noise mitigation (see white boundary below). A geotextile will be installed to separate the later added rock from the soil
- No ground preparation (blue boundary below), this area is planned to be fenced off however no ground preparation will be executed here. This area acts as temporary storage for e.g. equipment and the mud lagoon north of the site.

A detailed design drawing showing the layout of the HDD Works at Warren Farm is presented in **APPENDIX C**.


**Figure 4.5: Non Indicative Entry Site Set-up for HDD works. Detailed view on the left, overview of Warren Farm on the right.**

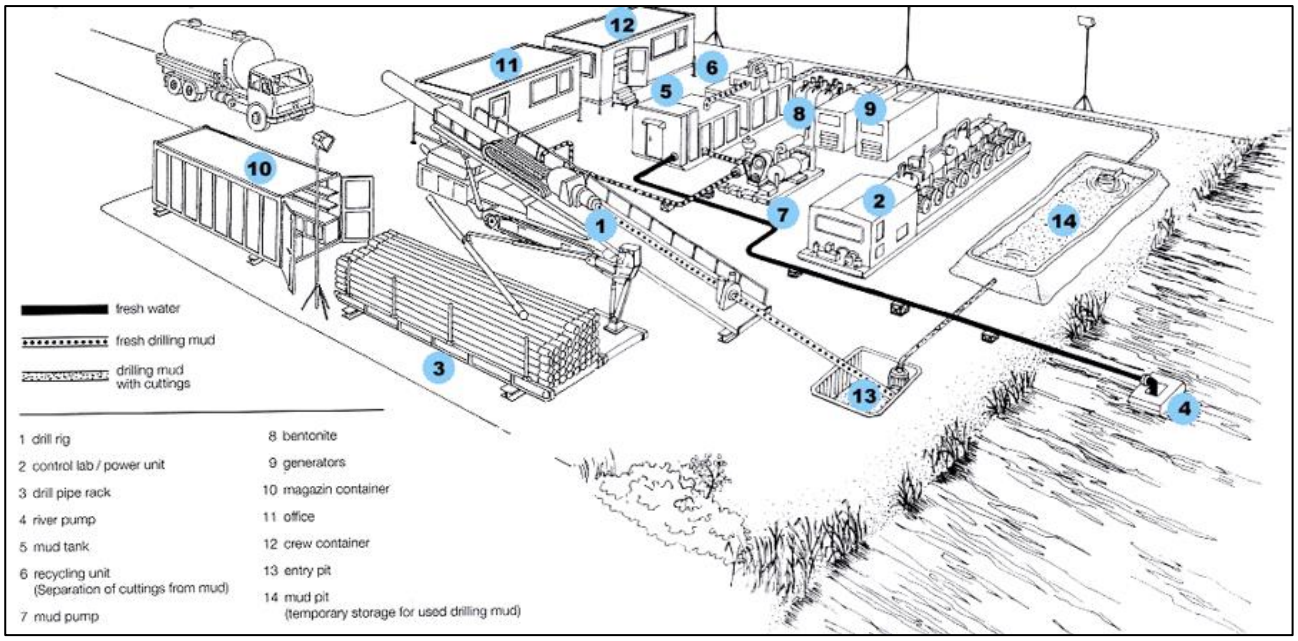


**Figure 4.6: Indicative representation of typical HDD equipment.**

At the working plateau the site offices as well as the main welfare for the site team will be located. The welfare will consist of modular temporary buildings including offices, canteen, changing rooms and toilet facilities. More information regarding the welfare facilities can be found at **Section 4.2.4- Welfare Facilities**. Around the site hoarding and/or fencing will be installed to separate the site compound from the area. Hoarding is used to limit the impact to the birds visually, when resting at Warren Farm.

Once site establishment is completed the drilling equipment will be mobilised to site, equipment will be delivered by trucks in accordance with the traffic management measures described in **Section 6.4**. Equipment is unloaded and positioned as required by means of all terrain crane or hiab trucks.

The HDD entry pit is excavated, as well as a lagoon for the storage of drilling fluids. More on the use of drilling fluids can be found at **Section 4.5.8 - Drilling Fluid Management**. The excavated soil from the entry pit and the lagoon for the drilling fluid will be stored close to their original location whenever possible, so that arable soils are returned to arable fields and grassland soils used to restore grassland fields, and sand to sand. The soil will be reinstated after completion of construction phase. The drilling fluid lagoon will be lined and located within a fenced area that will prevent fluid from migrating offsite during the works.

To secure the drill rig in place, a sheet piled wall will be constructed onto which the expected thrust and pullbacks loads during the drilling works are transferred to.

Once equipment is placed at the site, the drilling crew will connect all hydraulic hoses, electrical cables etc. to make the HDD equipment operational. All equipment is then function tested to ensure it is properly working before the drilling commences. An indicative list of the main plant and equipment required at the HDD Exit Pit is resented in **Table 4.2**.

**Table 4.2 Indicative list of main equipment at Warren Farm HDD Entry Pit site for the cable conduit installation under dunes.**

| Equipment | Quantity* | Power generated by | External Generator supply quantity | Indication size of external generator |
|---|---|---|---|---|
| Welfare / office facilities | -* | Diesel generator | 1-2x | 30-50 kVa |
| Workshop /storage / control containers | -* | Same generator of welfare containers | - | - |
| Directional Drill Rig | 1 | Internal diesel generator | 2x (of which 1 spare) | 500 kVA |
| Drilling fluid shale shaker | 1 | Internal diesel generator | | |
| Concrete mixer truck | 3 | Internal diesel generator | Internal | - |
| Truck mounted concrete pump | 1 | Internal diesel generator | Internal | - |
| Vibratory roller | 2 | Internal diesel generator | Internal | - |
| Excavator | 1-3 | Internal diesel generator | Internal | - |
| Dozer | 1 | Internal diesel generator | Internal | - |
| Tractor / trailer | 1-2 | Internal diesel generator | Internal | - |
| Cranage | 1 | Internal diesel generator | Internal | - |
| Towerlights | 4-6 | Diesel generator | Internal / external | 5-15 kVA each |
| Pumps | 0-1 | Diesel generator | 1x | 50 kVA* |

At the end of the HDD works, it may be decided to leave the hoarding/fencing erected, stone layer and welfare, and other containers in place which are required for the later cable installation works. This to minimise disruption and prevent double (de-)mobilisation of this equipment from and to the site compound.

### 4.5.3 HDD Exit Pit Establishment

Concurrently to the mobilisation of the drilling equipment at the main HDD Entry Pit site, the secondary HDD Exit Pit site is prepared. The exit location is considered a satellite site, smaller in scale. As with the Entry Site, this will be appropriately signed, fenced, and house welfare equipment. Once the site is set up, construction equipment such as excavators, piling rig, sheet piles, pumps and generators will be transported to the HDD Exit Pit.

A detailed design drawing showing the layout of the HDD Exit Pit works at Talacre Beach is presented in **APPENDIX D**.

Some of the equipment will be delivered to the Entry Site where it is loaded onto an agricultural tractor and trailer before being driven to the beach for installation. Larger equipment such as excavators or the piling rig will be delivered directly to the Talacre beach car park. Alternatively, the farm yard at the Warren farm entrance could be used that is just located off Station Road. This would reduce the distance to travel through the farm field to reach Entry Site and back.

Due to the ramp that crosses the sea wall at the car park entrance HGV's are unlikely to be able to cross the ramp, a detailed plan of how to manage this will be developed in time, at this stage it is likely that HGV's will have to reverse down the narrow section of road approaching the car park, equipment shall be unloaded at the bottom of the ramp and then will be driven over the ramp into the car park.

To minimise risk and inconvenience to the public this could be undertaken during early mornings when the area is quieter, a means of protection for the road surface such as car tires or rubber matting will be deployed.

To ensure secure containment of drilling fluid during operations and prevent any discharge into the marine environment, an exit pit is constructed. For the Gronant dune system HDD on the intertidal side, this pit will be excavated 2–3 metres below ground level. Due to both the required depth and the associated risk of excavation collapse, it may be necessary to reinforce the excavation with trench boxes and sheet piles. Groundwater accumulating in the excavation will be removed using temporary pumps as needed, with any seawater ingress returned directly to the sea. The pile height above the beach will be determined based on predicted tidal heights and pit location to prevent seawater entry at high tide. Additionally, sandbags will be positioned around the sheet piles to minimise tidal scour effects.

During the drilling process, effective management of drilling fluid requires its transfer from the HDD exit pit back to the HDD entry site for recycling. To address this need, it is proposed that a dedicated mud return line be drilled adjacent to the HDD drill line. Given the sensitivity of the area and the impracticality of completing all transfers by road due to distance constraints, installing a mud return line via an initial bore between the HDD entry and exit sites has been recommended. The drill pipe will be left in place to function as a transfer conduit between the two locations. Upon completion of the works, this pipe will be removed.

However, cuttings present within the fluid may obstruct the mud return line; therefore, the drilling fluid is initially cleaned at the beach. To achieve this, it is recommended to install a shaker system—comparable, though smaller in scale, to the recycling facility situated at the HDD entry site at Warren Farm. This shaker will remove larger cuttings from the drilling fluid, thereby allowing the cleaned fluid to return via the mud return line. The separated cuttings will be securely contained at the beach and subsequently transported by agricultural tractor or vacuum tankers to Warren Farm, where they will be transferred by licensed carriers for either offsite reuse or disposal.

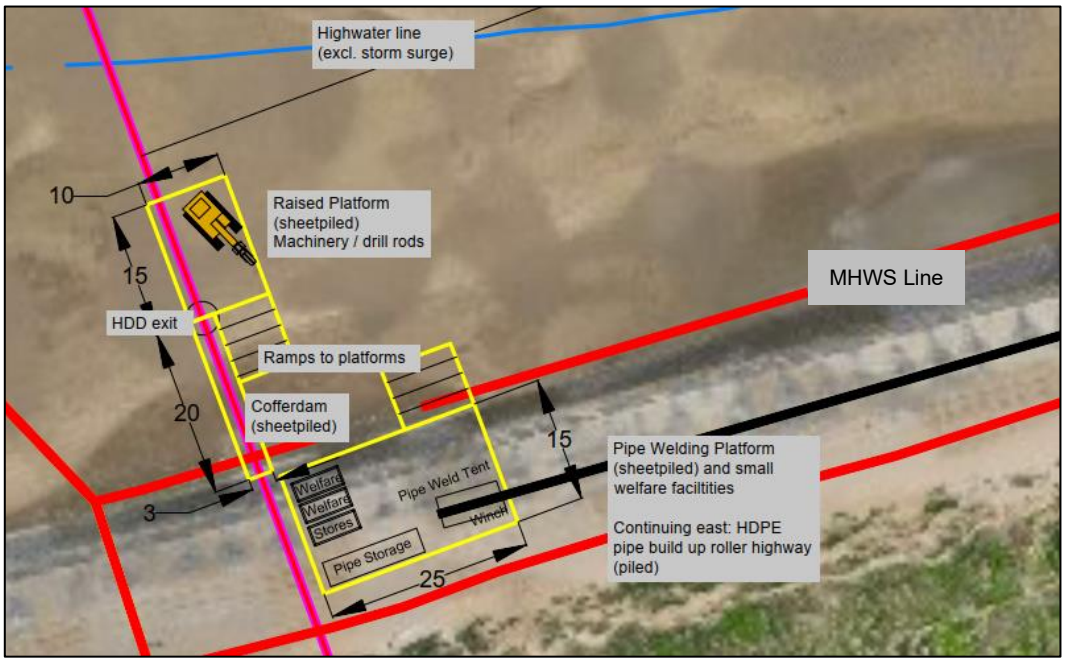


**Figure 4.7: Non Indicative Site Layout Exit Pit**

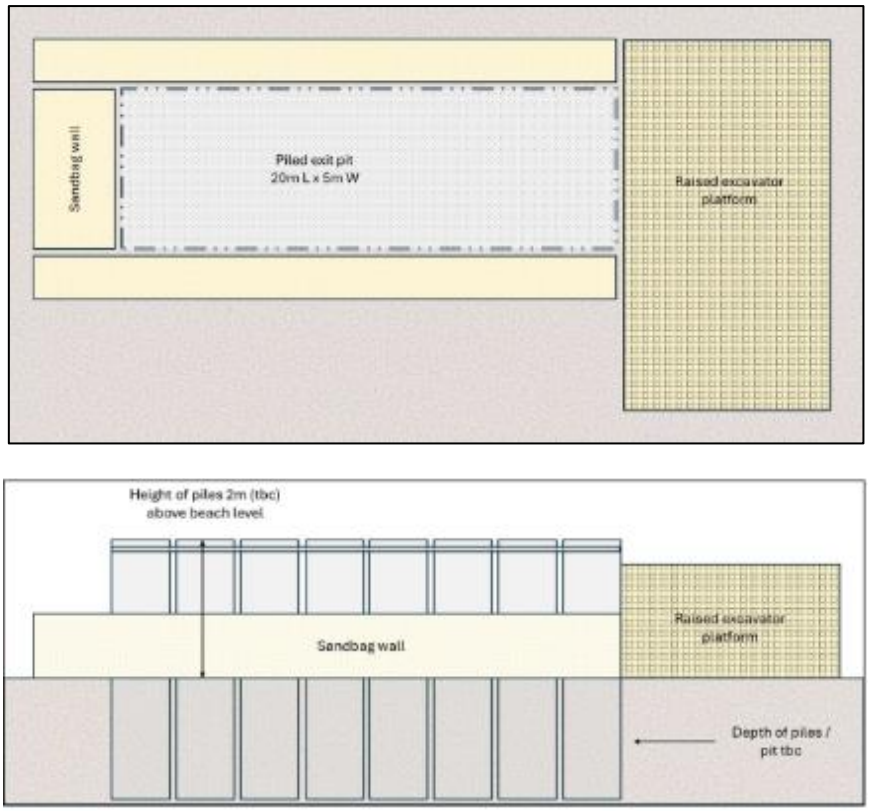


**Figure 4.8: Typical Sheet Piled Exit Pit (top and side view) Raised Working Platform**

A raised working platform may be required, as shown in **Figure 4.8**, to ensure equipment and storage containers are dry at high tides. An indicative list of the main plant and equipment required at the HDD Exit Pit is presented in **Table 4.3**.

**Table 4.3 Indicative list of main equipment at Talacre Beach HDD Exit Pit site for the cable conduit installation under dunes.**

| Equipment | Quantity* | Power generated by | External Generator supply quantity | Indication size of external generator |
|---|---|---|---|---|
| Welfare / office facilties | -* | Diesel generator | 1-2x | 30-50 kVa |
| Workshop /storage / control containers | -* | Same generator of welfare containers | - | - |
| Excavator | 1-3 | Internal diesel generator | Internal | - |
| Dozer | 1 | Internal diesel generator | Internal | - |
| Tractor / trailer | 1-2 | Internal diesel generator | Internal | - |
| Cranage | 1 | Internal diesel generator | Internal | - |
| Winch | 1 | Internal diesel generator | Internal | |
| Towerlights | 4-6 | Diesel generator | Internal / external | 5-15 kVA each |
| Pumps | 0-1 | Diesel generator | 1x | 50 kVA* |

### 4.5.4 Pipe welding (heat bonding)

**Figure 4.9** shows that the area for the HDD conduit pipe assembly will be established besides the HDD Exit Pit. To store the machinery during high water, the pipe welding area will be set up to the east of the HDD Exit Pit. From the pipe welding area, rollers will be temporarily installed over a length of 500m to create a solid structure onto which the pipe can be assembled, and secured during highwater.

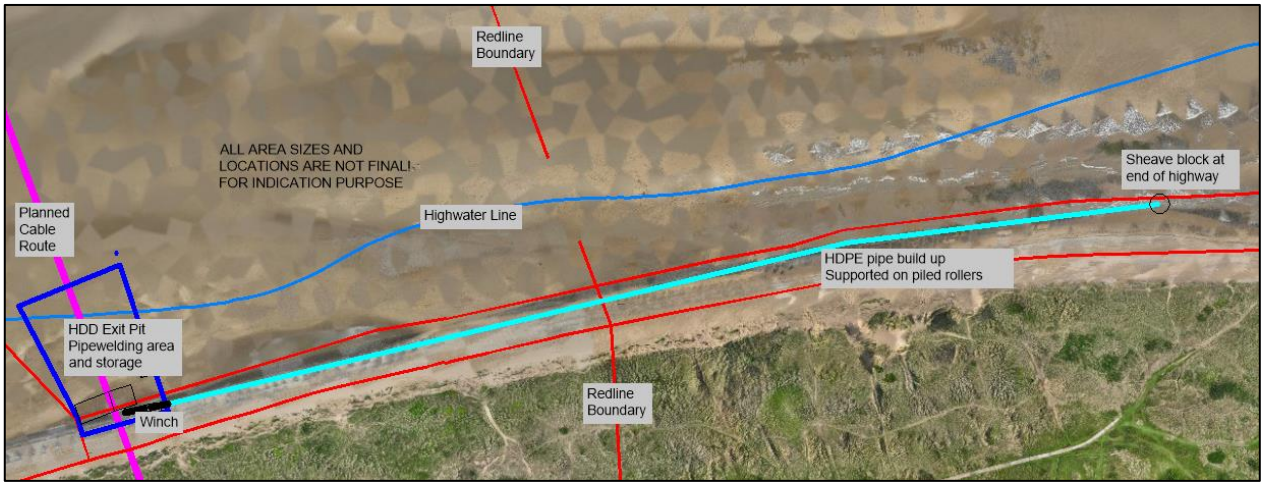


**Figure 4.9: Pipe Assembly at beach proposal. HDD exit pit and location size for visual reference only - not indicative**

The equipment and materials required for welding the HDPE ducting will be transported first to Warren Farm. At Warren Farm, the equipment will be loaded on a tractor and trailer to transport it to the beach area, which is done via Talacre car park beach entry. This minimises the access road disruption at Talacre car park from the offloading and movement of equipment.

Larger sized equipment like excavators that cannot be transported by tractor and trailer, remain planned to be (off)loaded at Talacre car park and/or at down the ramp of the sea defence. Trucks need to reverse down the narrow section of Station Road approaching the car park, and equipment shall be (un)loaded at the bottom of the ramp and then will be driven over the ramp into the car park. To minimise risk and inconvenience to the public, and local businesses, this would be undertaken outside of busy periods when the area is quieter. A means of protection for the road surface such as car tires or rubber matting will be deployed. Plastic road plates may also be used where necessary to minimise ground disturbance and to preserve the condition of the car park entrance route.

The following equipment would be required for the pipe welding area.

- 6-7x HDPE pipe stacks to store 550m of 355mm pipe incl spares. Footprint of each stack 12m x 1m.
- Welfare facility incl. generator
- Mobile winch incl. generator
- Concrete ballast blocks Approx 1t.
- Fencing and signage
- Rollers incl. piles
- Crane mats
- Excavator
- Pipe welding equipment


**Figure 4.10: Indicative Example piled roller highway (left), typical mobile winch**

**Figure 4.11: Typical pipe welding equipment, storage of pipes and welfare not shown**

A mobile winch (see **Figure 4.10**) will be mobilised to the beach and set up near the pipewelding area. The winch wire is routed below the roller highway and redirected at the end of the highway by a sheave block back to the HDPE pipe resting on the rollers. By paying in on the winch, the HDPE pipe can be moved over the roller highway for the crew to weld the next pipe section onto this. This would remove the need for multiple excavators during the pipewelding process and, therefore, limit the noise emitted during the pipe welding process. Please see **Figure 4.12** for a sketch of this setup.

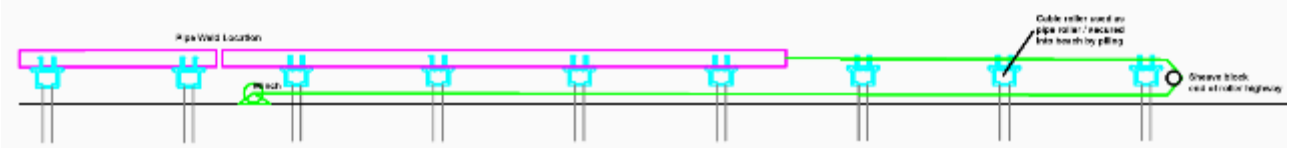

**Figure 4.12: Sketch pulling HDPE pipe over roller highway by winch instead of moving it by excavators**

The assembly operations can continue throughout the tidal cycle on the beach, as the machinery, equipment and the roller highway are raised above the beach surface and high water line, where possible the welding will be planned to avoid high spring tides. The piled rollers also provide the opportunity to secure the HDPE pipe in place during (spring) high water. It is noted however that due to overwintering birds, this operation may need to be halted 3 hours either side of high tide.

The distance between Talacre car park beach entry and the most eastern location on the beach site compound (i.e. sheave block at the end of the roller highway), is more than 700m. As the final HDD exit location is not yet

defined and could be more to the eastern edge of the red line boundary, a minimum distance of 500m would still be in place.

### 4.5.5 Pilot hole

When all site establishment activities are completed and the pipe is ready the drilling process can commence, the following key activities describe the process

The first stage of the process is to drill a pilot hole from HDD entry point to HDD exit point, a drill bit with a bent section (see **Figure 4.13**) is used to make the pilot hole, directional control is achieved by orientating the bent section in the direction of desired drill path.


**Figure 4.13: Typical drilling rig and pilot drilling assembly**

A steering tool will be located inside the drill bit to provide the driller with the real time information required. Sections of drill pipe are added to the rig each time drill pipe is installed; this process continues until the drill bit arrives at the exit pit. Drilling fluids are pumped down the drill string to jet the strata, cool the bit and flush out cuttings from the bore hole, the drilling fluids also maintain the integrity of the bore to prevent collapse and seal the bore from water ingress. The bentonite that comes in contact with the surrounding soils creates a so called 'bentonite filter cake'. This is a thin, impermeable layer formed on the walls of permeable formations and acts as a barrier between the drilling fluid and surrounding rock, soil and/or groundwater.

Cuttings are removed from the drilling fluid at the mud plant located at the entry site, and the fluid is circulated continuously through the system.

### 4.5.6 Reaming phases

When the pilot is completed, the pilot drilling assembly is removed at the HDD exit point and replaced with a back reaming assembly. This back reaming assembly is drilled from the exit to the entry site again in sections of drill pipe which are removed one by one at the entry site, behind the reaming assembly extra drill pipes are added so that upon completion of the reaming phase a drill string remains inside the bore hole to ensure the drill path is not lost.

This process can be repeated several times to enlarge or clean the bore hole until the drilling team are satisfied that the bore hole is ready for pipe installation. Drilling fluids are also pumped constantly during this process to clean the hole of the cuttings and stabilise the bore hole.

**Figure 4.14: Rear reaming assembly**

### 4.5.7 Pull back

When the reaming phase is complete the pipe pull back will commence, the pipe string in one continuous length is delivered the exit point of the HDD from the storage location on the foreshore, the pipe is pulled by one or more excavators until the 1st end arrives near to the exit point, then the pipe is aligned with the direction of the drilled hole. Rock bags or other may be used to keep the pipe in the required position and bend, prior entry at the exit point.

During this operation, all unauthored personnel and public would be excluded from the work area. However, as working is planned around high tide, passage near the dunes and near the waterline remains possible for the public to pass this area. **Figure 4.15** shows a box of no access but allowing passage around it.

The pipe shall be connected to the drill string in the bore hole and then the pull back operation will be executed continuously until the pipe is fully installed. As with pilot drilling and reaming the drilling fluids are continuously pumped down the hole to lubricate the pipe and remove cuttings from the bore hole.

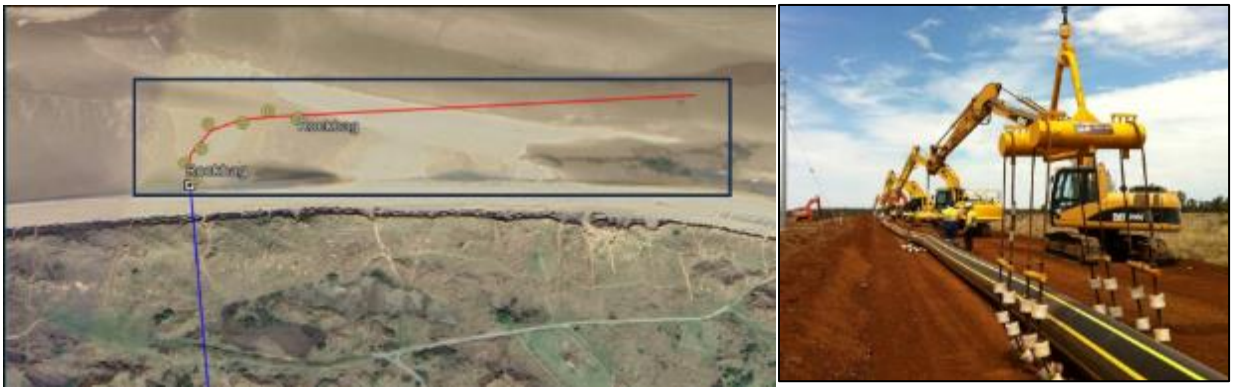

**Figure 4.15: Pipe repositioned for pull back**

### 4.5.8 Drilling Fluid Management

Please see the details at **Section 6.7.2 - Waste Management Plan - Drilling fluid management**.

### 4.5.9 Pipe finalisation

On successful installation of the duct from exit to launch pit, a gauging swab will be used to prove the internal integrity ahead of cable pulling works, as shown in **Figure 4.16**.

The gauging swab is pushed through the installed duct using clean water pumped under pressure from the high-pressure mud delivery pump in the drill compound. The gauge (aluminium disk) will be sized at 90% of the inside duct diameter. Once the gauging swab has been pushed the duct any damage or deformation of the duct ID would in turn deform the gauge disk. No deformation of the gauge plate confirms the duct is installed with little or no internal defect.

Following successful passing of the gauging swab assembly, a second pass using a solid foam swab will be completed in the same manner. During this pass a messenger rope will also be installed and secured via the blanking pat each end of the duct ready for use during the cable installation operation.

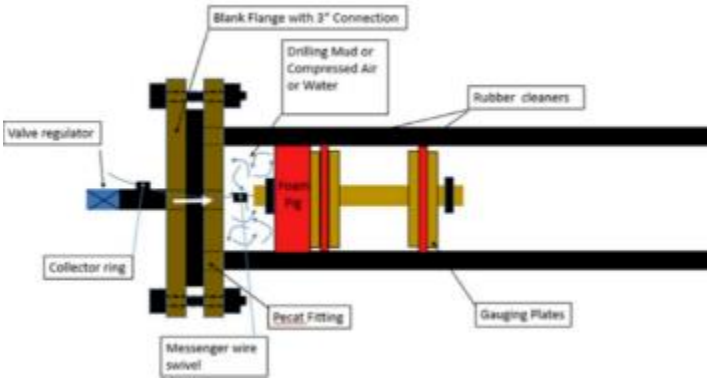


**Figure 4.16: Schematic of gauging swab assembly**

Duct end sealing and capping will be completed using an end restraint flange adaptor and cover plate, as shown in **Figure 4.17**.

**Figure 4.17: Flange adaptor + cover plate duct seal**

### 4.5.10 Programme for HDD works

**Figure 4.18** summarises the activities for the installation of the HDD Entry Pit in Warren Farm, and the Exit Pit on Talacre Beach, and shows that the indicative programme is aiming to avoid the little tern breeding season by carrying out the HDD Conduit, and Exit Pit works during February and March 2026.

**Figure 4.18** also shows the assumptions, and environmental considerations factored into the planning of the works. The anticipated duration of each activity required for the installation of the HDD Exit Pit is shown. Detailed design and engineering may require minor modifications to the exact timing of the works.

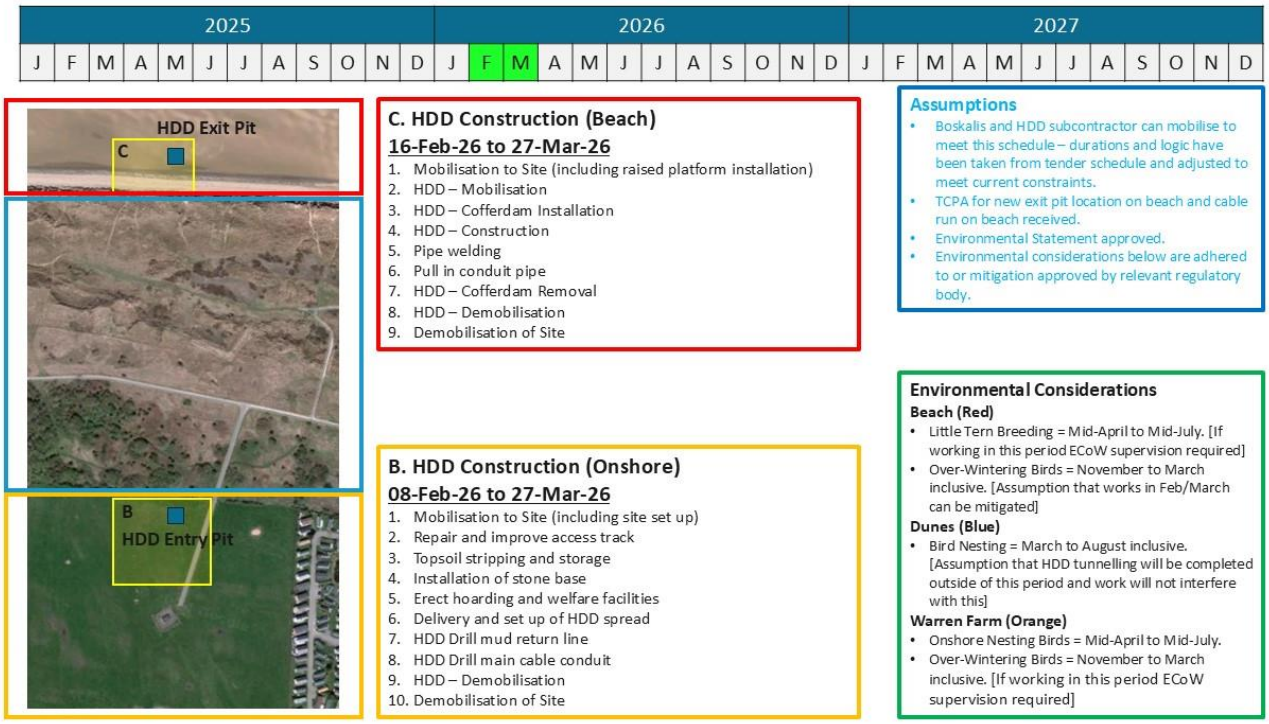


**Figure 4.18: Indicative summary activities and programme for installation of HDD Entry Pit recognising environmental sensitivities**

## 4.6 Intertidal Cable Installation

Cable installation in the intertidal area consists of four main activities, (1) installation of the cable highway and pulling equipment, (2) the cable onshore landing operations, (3) cable burial operations, and (4) equipment demobilization and site reinstatement.

To execute the shore pull the CLV will be positioned as close to Mean Low Waterline (MLW) as possible, it is anticipated that the CLV will beach during the shore landing. Once the CLV has stabilised in position the pulling wire from the beach winch will be connected to the cable. The cable will then be pulled across the cable highway on the beach until arriving at the exit point of the HDD, here the cable will enter the conduit and be pulled until the pulling head of the cable arrives at the beach winch that shall be in the HDD entry site,

The offshore cable lay and burial operations will commence as soon as possible after the completion of the shore pull. The CLV with the support of various tugboats will manoeuvre along the cable route towing a plough that will simultaneously bury the cable as the CLV moves ahead.

### 4.6.1 Site Establishment

Contractor will setup all equipment required for the preparatory works, the pull-in and the post pull-in works. This is done both at the onshore site (earlier HDD entry site) and beach site (HDD exit site). Access to the beach will be from the Talacre beach car park. The use of temporary matting is not foreseen but may be

deployed should the need arise; the use of such equipment is considered as a risk due to the tidal environment and the trip hazard they present to the public. Regular maintenance of the access route shall be undertaken to remove ruts that can be a risk for the public or workforce.

A temporary fence may be erected to safeguard both the public and workforce and provide security of the works, this will be in certain areas deemed necessary, it is not practical to fence off the entire working area due to the tidal environment.

Signage will be installed at the beach and in the local notice boards to advise the public of where to safely pass the works. The operational crew will also maintain watch for any persons who may be approaching the works to close, operational crew will advise.

Detailed design drawings showing the site set-up for the cable pull and installation at Warren Farm and on Talacre Beach are presented in **APPENDIX E**, and **APPENDIX F**.

An indicative list of the main plant and equipment for the cable pull and installation required at the HDD Entry Pit is resented in **Table 4.4**.

**Table 4.4 Indicative list of main equipment to be mobilised to Warren Farm, HDD Entry Pit site, for the cable pull and installation.**

| Equipment | Quantity* | Power generated by | External Generator supply quantity | Indication size of external generator |
|---|---|---|---|---|
| Welfare / office facilties | -* | Diesel generator | 1-2x | 30-50 kVa |
| Workshop /storage / control containers | -* | Same generator of welfare containers | - | - |
| Cable pull-in winch | 1x* | Diesel generator | 2x (of which 1 spare) | 500 kVA |
| Excavator | 1-3x* | Internal diesel generator | Internal | - |
| Tractor / trailer | 1-2x* | Internal diesel generator | Internal | - |
| Cranage | 1x* | Internal diesel generator | Internal | - |
| Towerlights | 4-6x* | Diesel generator | Internal / external | 5-15 kVA each |
| Dewatering | 0-1x* | Diesel generator | 1x | 50 kVA* |
| Cable rollers | 10-15x* | N/A | - | - |
| Road plates | -* | N/A | - | - |
| Bog mats | -* | N/A | - | - |
| Concrete blocks | -* | N/A | - | - |
| Fencing | -* | N/A | - | - |
| Crowd barriers | -* | N/A | - | - |
| Rigging | -* | N/A | - | - |

**Figure 4.19: Example of typical cable pull winch**

**Table 4.5 Indicative list of main equipment to be mobilised to Talacre Beach, HDD Exit Pit site, for the cable pull and installation.**

| Equipment | Quantity | Power generated by | External Generator quantity | Indication size of external generator |
|---|---|---|---|---|
| Welfare / office facilties | 2-3x* | Diesel generator | 1x | 30-50 kVa |
| Workshop /storage / control containers | -* | Same generator of welfare containers | - | - |
| Winch | 1x* | Diesel generator | 1x | 75 kVA* |
| Excavator | 1-3x* | Internal diesel generator | Internal | - |
| Tractor / trailer *(same as Warren Farm)* | 1-2x | Internal diesel generator | Internal | - |
| Cranage | 0-1x* | Internal diesel generator | Internal | - |
| Raised excavator | 0-1x | Internal diesel generator | Internal | - |
| Post lay burial machine | 0-1x | Internal diesel generator | Internal | - |
| Towerlights | 6-8x* | Diesel generator | Internal / external | 5-15 kVA each |
| Tracked Cable Tensioner | 0-2x* | Diesel generator | 1x / 1x spare | 300 kVA |
| Dewatering | 0-1x* | Diesel generator | 1x | 50 kVA* |
| Cable rollers incl steel poles | >150* | N/A | - | - |
| Beach anchor(s) | 2-4x* | N/A | - | - |
| Road plates | -* | N/A | - | - |
| Bog mats | -* | N/A | - | - |
| Concrete blocks | -* | N/A | - | - |
| Link floats | -* | N/A | - | - |
| Fencing | -* | N/A | - | - |
| Crowd barriers | -* | N/A | - | - |
| Chutes / mid support platoon | -* | N/A | - | - |
| Rigging | -* | N/A | - | - |

The method for the installation of the cables across the intertidal area, given the known geological conditions, is to pull the cable across a roller highway using a winch, once the cable is pulled ashore it will be buried by means of excavators, a plough or a trencher typical cable installation equipment is shown in **Figure 4.20**.


**Figure 4.20: Typical plant and equipment for cable installation across inter-tidal like the offshore wind farm cables historically installed between Prestatyn and Rhyl.**

The cable highway will be installed on the beach shortly before the cable pulling activities take place, rollers will be installed (likely on piles driven by excavator/vibration) every 3-5m depending on the type of cable to be installed, it may also be necessary to construct a mid support pontoon where a cable engine is located, this will be to support the winch and avoid overtensioning the cable during the pulling operations.

**Figure 4.21: Raised shoreline cable engine**

Near the low water line a beach chute may be positioned on a working platform, similar to the platform supporting the cable engine. This chute is used to guide the cable coming from the sea into the cable rollers behind it.

**Figure 4.22: Shoreline beach chute as operated on previous projects**

The mid support pontoon is a working platform created to keep critical equipment above the water line during high tide periods, the pontoon can be created from scaffolding, or modular pontoon sections, the cable engine would be secured to a sheet piled wall known as a dead man anchor. Concrete blocks, wooden crane mats, and one tonne sacks filled with locally sourced material may be used to protect the structure from the effects of tidal scour. Electrical and hydraulic powered equipment will be installed on the pontoon, all tanks shall be bunded, refueling will be mitigated wherever possible and when undertaken best practice shall be followed with appropriate spill kits at the point of use. Welfare and lighting shall be installed to ensure the safety of the workforce.

All the equipment required for the cable pulling will be delivered to the beach by means of agricultural tractor and trailer, assessment of the beach shall be undertaken in advance to ensure vehicles do not become stuck in soft areas, A stranded equipment rescue procedure shall be in place for the operations, and the procedure shall be trialed be means of regular drills to ensure effectiveness.

### 4.6.2 Cable onshore landing operations

When the cable highway is prepared the winch wire shall be pulled across the cable highway by means of a secondary winch located near the low water line, this winch will be temporarily secured to a tracked excavator.

At the arrival of the CLV, beach anchors may be required to position the vessel at the shallow waters near the shore. These anchors are transported by tractor and trailer towards the beach and are dug in by excavator. A forerunner is then placed on the beach for a vessel to collect at highwater and transfer to the cable lay vessel (CLV).

When the CLV has been positioned (on anchors) and is ready for the cable pull-in, the beach winch pull in wire will be recovered by the CLV team. Once connected to the cable the pull in operations will commence, the cable is pulled over the chute of the CLV, it may be partially floated for a section of the pull in until it reaches the cable highway, once on the roller highway installed on the beach, the cable is pulled over the beach, through the HDD until it arrives at the HDD Entry site.

Once the pull is complete, the cable laying vessel will use the plough to simultaneously lay and bury the cable out towards the offshore platform. **Figure 4.20** illustrates the typical plant and equipment for cable installation across inter-tidal similar to cables historically installed between Prestatyn and Rhyl.

### 4.6.3 Cable burial operations

Contractor proposes to utilize a tracked cutter trencher to carry out onshore post-lay burial of the cable in the intertidal area to HDD exit. The tool is an effective tool that minimizes environmental impact. The cable will be buried during a single low tide from the low water line towards the duct.
When required, a safe haven near the HDD exit will be built for the trencher to shelter with high water (pending beach profile at time of project).

Alternatively, a trench with the excavators can be dug and the cable lowered inside. This operation would require more time, then the tracked cutter trencher would require to bury the cable. Access of the tracked cutter trencher towards the beach remains to be checked whether feasible.

**Figure 4.23: Tracked cutter trencher for onshore and intertidal burial**

A small cable bight may remain between the plough grade-in (that was lowered overboard by the CLV before) and onshore burial tool grade-ins. This bight will be buried by (raised) excavators or a land-based post lay burial-jetting device, pending the actual length expected. Alternatively, a vessel-based post lay burial tool could be deployed, that depends on fluidising the seabed for the cable to lower itself inside the trench.

The HDD exit point will also be lowered below the beach level to the required depth of burial. This is achieved by side digging with excavator and lowering the duct to the required depth. This trench is backfilled afterwards.

### 4.6.4 Equipment demobilisation and site reinstatement

All equipment, including temporary fencing and signage will be removed upon completion of the works. Traffic and access management including an Outline Construction Traffic Management Plan (CTMP) has been consented under **FUL/000246/23** and will be implemented for the execution of the HDD and cable installation works.

At the HDD entry site, the cable will be handed over back to the Employer, which will start jointing of the offshore cables onto the onshore cables. This scope is not part of the offshore contractor pulling-in the offshore

cables at POA. On the beach, both the cable and HDD has been brought to the required depth of burial and therefore will be covered by sand. Remaining equipment on the beach will be demobilised.

### 4.6.5 Programme intertidal work

**Figure 4.24** summarises the activities for the installation of the electrical cable on Talacre Beach and show that the indicative programme is seeking to carry out the activities towards the end of the little tern breeding season from early July 2026. **Figure 4.24** also showing the assumptions, and environmental considerations factored into the planning of the works.

The Realigned Route makes for a simpler cable installation to that which would have been required for the original Preferred Route. This is because the cable shore pull and subsequent lay and burial of the cable, would be along a straight, rather than sinuous alignment, which can be carried out over a shorter timeframe. For the installation of the Realigned Route, the types and numbers of plant and equipment required to carry out the works would remain as reported in the consented ES by NRW-ML (CML2365). Detail engineering must be completed before the duration of the works or the calendar period of execution can be verified.

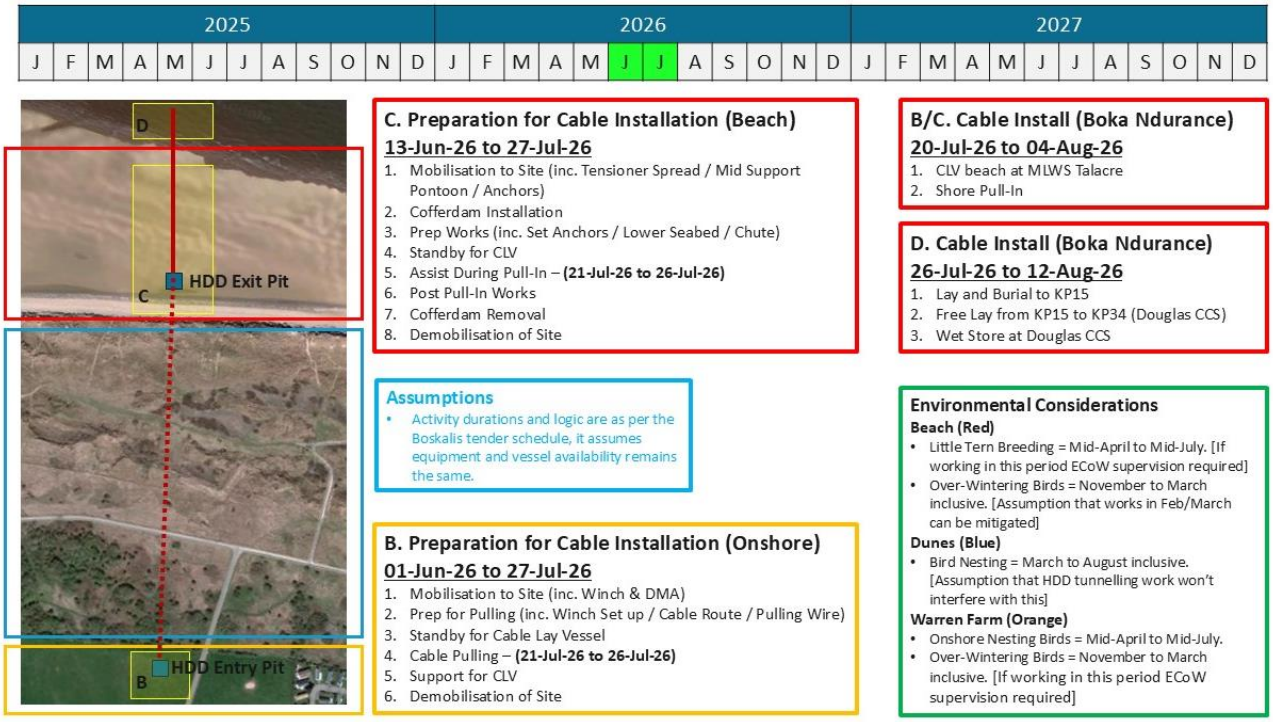


**Figure 4.24: Indicative summary programme showing timing and duration of activities for installation of HDD Exit Pit on Talacre Beach**

## 5.0 ENVIRONMENTAL ASPECTS

The key environmental sensitivities are summarised in this section, with consideration as to how this may be affected by the Proposed Development.

### 5.1 Archaeological features

There are two Second World War aircraft crash sites in the vicinity of the Proposed Development. There are two Spitfire wrecks that are recorded as being near the Proposed Development. The Joint Casualty and Compassionate Centre of the Ministry of Defence confirmed that the aircraft crash locations are approximate, and that any aircraft remains would need to be excavated under licence and should be recorded and handled in line with legislation and all professional guidance. A further license is not required from Flintshire Council for aircraft crash site excavation.

The Archaeological Fieldwork Contractor will be appointed and inform the Archaeological Consultant immediately, who will then consult with the LPA Archaeological Advisor.

The area of potential archaeological impact will be within the footprint of the HDD exit pit at the MHWS and its temporary access. Shallow archaeological remains may be affected by movement of vehicles and plant involved in construction activities, for example through rutting and compaction.

Due to the method through which the trench between the exit pit and the MLWS will be excavated and filled in, these works are excluded from this PD and will be monitored through the implementation of the Protocol for Archaeological Discoveries submitted with the Marine Licence Application (Licence number: **CML2365**) for the marine elements of the works (Environmental Statement Report Volume 4, Appendix U).

In the unlikely event that remains of very high significance are identified, the Archaeological Fieldwork Contractor will inform the Archaeological Consultant immediately, who will then consult with the LPA Archaeological Advisor.

### 5.2 Ecology

Ecological surveys were conducted as part of the TCPA application **FUL/000246/23** during 2022. New and additional surveys for several notable species and habitats have been undertaken in 2024 and 2025, and the updated findings are summarised in **Table 5.4**, and **Table 5.5**.

#### 5.2.1 Designated Sites

The desk study identified eleven statutory nature conservation sites of international importance within 10km of the RLB for the PoA Terminal, as shown in **Table 5.1**.

**Table 5.1 Statutory and Non-Statutory Designated Sites**

| Site | Designation | Distance from Site |
|---|---|---|
| **Statutory Designated Sites** | | |
| Dee Estuary/Aber Afon Dyfrdwy | Site of Special Scientific Interest (SSSI) | Within RLB |
| The Dee Estuary | Special Protection Area (SPA) & Ramsar | Within RLB |

| Site | Designation | Distance from Site |
|---|---|---|
| Dee Estuary/Aber Dyfrdwy | Special Area of Conservation (SAC) | Within RLB |
| Dee Estuary/Aber Afon Dyfrdwy | Ramsar | Within RLB |
| Gronant Dunes and Talacre Warren | SSSI | Within RLB |
| Liverpool Bay/Bae Lepwl | SPA | 0m |
| Mersey Narrows and North Wirral Foreshore | SPA | 7km |
| Mersey Narrows and North Wirral Foreshore | Ramsar | 7km |
| Halkyn Mountain/Mynydd Helygain | SAC | 9.5km |
| Dee West | Shelfish Protected Area | 500m |
| NVZ ID: 135 (Groundwater) | NVZ | 1,600m southwest |
| **Non-Statutory Designated Sites** | | |
| Dee Estuary | RSBP Reserve | 270m east |
| Gronant Dunes | Local Nature Reserve (LNR) | 1.4km |
| Talacre Abbey and Woods | WSF | 500m |
| Tanlan Banks and Ffynnongroyw Woods | WSF | 1km |
| Big Pool Wood | North Wales Wildlife Trust Reserve | 1km |

### 5.2.2 Intertidal Habitats

The HDD Exit Pit will be located on the habitat types (LS.LSa.MuSa Polycheate_bivalve-dominated muddy sandy shores, and Mosaic: 85% LS.LSa.MoSa Barren or amphipod-dominated mobile sandy shores, 15% LS,LSa.MuSa Polycheate bivalve dominated muddy sandy shores), as shown in **Figure 5.1**.

While all intertidal flats at Talacre form part of the qualifying SAC habitat H1140, the mobile/barren sand biotopes, in which the HDD Exit Pit will be located, are of (*to use NRW's consultation feedback terminology*) comparatively "lower ecological value". This is because of their low species richness and opportunistic fauna. Whereas muddy sand flats with Macoma and Arenicola are of higher conservation importance owing to their biodiversity, structural complexity and critical function in supporting internationally important bird populations.

Liverpool Bay CCS Limited recognises that ecological value can mean slightly different things depending on context (conservation importance, biodiversity richness, functional role, designation sensitivity). Notwithstanding, as requested by NRW, to demonstrate that the HDD Exit Pit will be in an area of 'lowest' ecological value within the red line boundary, **Table 5.2** presents estimations of the relative value of the categories of habitats at Talacre Beach (Dee Estuary, Annex I 1140 habitat).

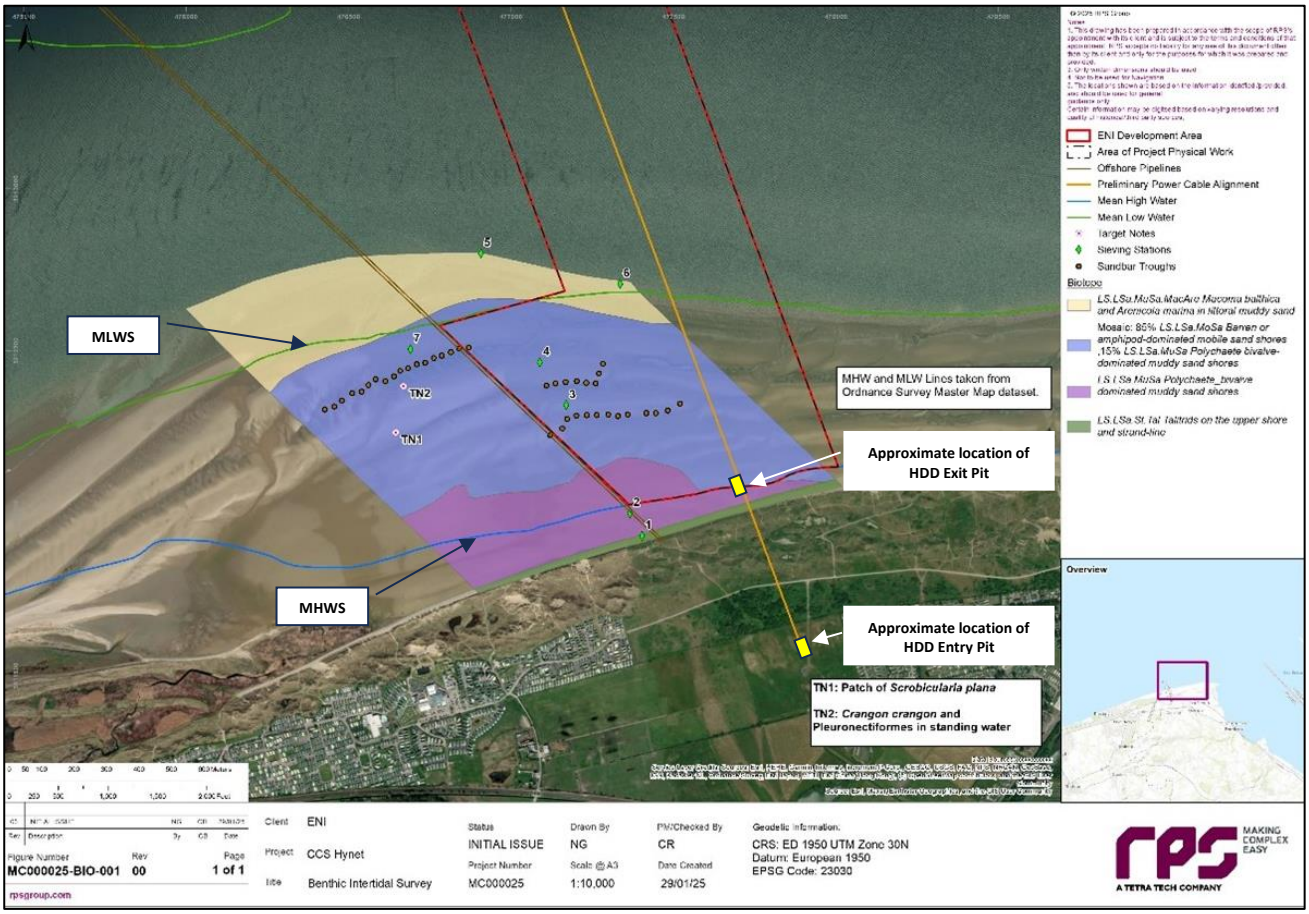


**Figure 5.1: HDD Exit Pit in relation to habitat types for Talacre (Dee Estuary, Annex I 1140 habitat)**

**Table 5.2 Relative 'ecological value' of habitat types for Talacre (Dee Estuary, Annex I 1140 habitat)**

| Habitat Type | Estimation of relative value |
|---|---|
| **Mobile / barren sand shores (amphipod-dominated)** | • **Biodiversity:** Typically **low** – sparse infauna, sometimes dominated only by amphipods (*Bathyporeia* spp.) or essentially barren due to sediment mobility.<br>• **Functional role:** Important as prey base for some fish and shorebirds, but overall **less structurally complex** and supports fewer specialist species.<br>• **Conservation value:** Generally considered the **lowest ecological value** of the listed types because of low species richness and high natural disturbance. |
| **Polychaete–bivalve dominated muddy sand / Mixed muddy sand (Macoma balthica, Arenicola marina)** | • **Biodiversity:** Much richer; supports **diverse polychaetes, bivalves, and bioturbators**.<br>• **Functional role: High** – influences sediment structure, nutrient cycling, and provides food for waders and fish.<br>• **Conservation value: Higher**, especially since *Macoma* flats are recognised as important prey grounds for estuarine birds. |
| **Strand-line (talitrids, beach hoppers)** | • **Biodiversity:** Often dominated by talitrid amphipods but linked to **wrack and detrital processing**.<br>• **Functional role: Significant** as part of the wrack-associated food web (e.g., birds, beetles).<br>• **Conservation value: Higher** than "barren sand," though patchy. |

Therefore, among the Talacre Beach habitats, the mobile / barren sand shores (amphipod-dominated), in which the HDD Exit Pit will be located, can be considered of the 'lowest' ecological value, due to low species richness, simple trophic structure, and high natural disturbance making them less critical for conservation relative to muddy sand flats and strand-line habitats.

**Table 5.3** provides a summary of some of the UK reference sources that support the notion that the mobile / barren sand / amphipod-dominated biotopes are lower in ecological value, in terms of species richness, functional complexity, and sensitivity, especially compared with, for example, muddy-sand flats with Macoma, Arenicola, etc.

**Table 5.3 Reference sources supporting 'lower' ecological value or mobile/barren sands**

| Reference source | Key points from reference source | Evidence for how it supports "lower ecological value" for mobile/barren sands |
|---|---|---|
| **JNCC Biotope: "Barren or amphipod-dominated mobile sand shores" (biotope type LS.LSa.MoSa)** | Describes the habitat as "mobile sands … limited range of species … barren, highly mobile sands to more stable clean sands supporting communities of isopods, amphipods and a limited range of polychaetes." (https://mhc.jncc.gov.uk/biotopes/jnccmncr00001522) | Indicates that species richness is low; the community is relatively simple and dominated by opportunistic fauna. Such simplicity often correlates with lower conservation priority relative to richer biotopes. |
| **MarLIN: "Amphipods and Scolelepis spp. in littoral medium-fine sand" (LS.LSa.MoSa.AmSco)** | Assesses sensitivity to changes (e.g. salinity) as "Low", with "High" resilience. That is, the habitat can recover well from disturbance and is not highly sensitive. (Amphipods and Scolelepis spp. in littoral medium-fine sand - MarLIN - The Marine Life Information Network) | A habitat that is not very sensitive, with high resilience, often implies lower ecological impact, as per NRW's implied in trade-off terms, since loss or disturbance is less damaging in the long-term compared to more sensitive habitats within the designated site. |
| **MarLIN: "Infralittoral mobile clean sand with sparse fauna"** | Characterised by a scarcity of species resulting from sediment mobility and abrasion. Fauna are transient, opportunistic. (Infralittoral mobile clean sand with sparse fauna - MarLIN - The Marine Life Information Network) | Sparse fauna, opportunism, high disturbance regime — all hallmarks of a lower complexity, lower ecological value biotope. Such habitats contribute less in terms of stable structure and specialised ecosystem services. |
| **MarLIN: "Barren littoral coarse sand"** | Notes that coarse sands drain rapidly, have low water and organic content, and high sediment mobility; macrofaunal community is mostly lacking. (Barren littoral coarse sand - MarLIN - The Marine Life Information Network) | Nearly barren, few faunal elements, largely abiotic environment. Clearly lower faunal biodiversity and lower functional complexity. |

### 5.2.25.2.3 Other Habitats of Conservation Importance

A UK habitat classification survey identified the following habitats:

- Modified grassland

- Dense scrub and introduced shrub
- Mobile Dunes
- Dune grassland
- Dune slacks
- Intertidal habitat
- Ponds

**Table 5.4 Summary of Habitats Present**

| Feature | Summary |
|---|---|
| Dense scrub and introduced shrub | To the south of the access track, the habitat consisted predominantly of dense scrub classified as h3h mixed scrub in UKHab and A2.1 dense/continuous scrub in Phase 1. There were also some more open patches, dominated by false oat-grass Arrhenatherum elatius between less dense scrub patches and towards the north-east of the mapped dense scrub area. The scrub consisted mostly of bramble Rubus fruticosus, with frequent sycamore Acer pseudoplatanus, hawthorn Crataegus monogyna and grey willow Salix cinerea. Some individual larger trees or small tree groups were also present and were recorded and condition assessed separately for use during NBB assessment. The habitat in this area comprises a mosaic of MG1 Arrhenatherum elatius grassland, W24 Rubus-Holcus undershrub, W2 Salix-Betula-Phragmites woodland and W6 Alnus-Urtica woodland. |
| Modified grassland | To the south of the dense scrub, there was a large, pasture field at Warren Farm, classified as g4 modified grassland in UKHab and B4 improved grassland in Phase 1. It is not within the Site but is within the Survey Area. The field was species-poor and dominated by perennial rye-grass Lolium perenne and white clover Trifolium repens, giving a close match to the NVC community MG7 Lolium perenne leys. |
| Dunes | The foredunes habitat type equates to UKHab s3a5 embryonic shifting dunes, Annex I embryonic shifting dunes (H2110) and NVC communities SD4 Elymus farctus ssp. boreali-atlanticus foredune community and SD5 Leymus arenarius mobile dune community. There is no separate classification to separate this habitat type from open dunes in Phase 1 methodology.<br><br>Embryonic shifting dunes were recorded along the seaward edge of the dunes in 2021/22 (with small amounts of the NVC SD4 Elymus farctus ssp. boreali-atlanticus foredune community being present) but were absent in 2025 during the walkover. Kim Norman of ENI informed the surveyors that large sections of foredunes had collapsed during storms over the winter of 2024/25, which accounted for the absence of embryonic shifting dunes. The majority of habitat within the Survey Area was classified as s3a6 shifting dunes with marram (UKHab). This equates to H6.8 open dune in Phase 1 and constitutes the Annex I habitat; shifting dunes with marram (H2120).<br><br>Within the shifting dunes with marram/open dunes there were three well-defined dune slacks in the eastern half of the Survey Area. These were classified as humid dune slacks s3a3 within UKHab and dune slack H6.4 in Phase 1. This habitat constitutes the Annex I habitat, humid dune slacks (H2190). The middle slack was partially enclosed by a post and wire fence around its northern section, whilst the southern section was un-fenced. Consequently, the vegetation coverage was far thicker in the fenced section, at the time of the walkover, with a thick carpet of pointed spear-moss Calliergonella cuspidata present within the fenced area. SD14 Salix repens-Campylium stellatum dune slack community and the SD16 Salix repens-Holcus lanatus dune slack community were recorded within the dune slacks. Areas dominated by pointed spear-moss would also seem to indicate an affinity with the SD15 Salix repens-Calliergon cuspidatum dune-slack community.<br><br>A long, narrow strip of short grassland, which ran east to west across the middle of the shifting dunes with marram/open dunes and between two of the dune slacks was recorded during the walkover. This shorter grassland was dominated by red fescue Festuca rubra and was classified as s3a7 dune grassland in UKHab, which equates to H6.5 dune grassland in Phase 1 and comprises the Annex I habitat, dune grassland (H2130). |

| Feature | Summary |
|---|---|
| Species-poor intact hedge | There are several hedgerows around and on the Site. Most are along the boundaries or only just within the Site, though there is one just to the west of Station Road which cuts across the route. This hedge and others in that area are mostly heavily managed and species-poor with Hawthorn and Blackthorn being the most abundant species. There are also some non-native or only partly native hedgerows, most notably surrounding an abandoned car parking area to the south-east of the Site. Only two of the hedges on or very close to the Site were species-rich, both being short but relatively tall and wide, and both located just to the south-west of the terminal. |
| Intertidal habitat | Immediately to the north of the open dune/shifting dunes with marram, the Survey Area encompassed a strip of beach. This strip would be classified as t2d5 intertidal mudflats and sandflats in UKHab and as H1.1 intertidal mud/sand in Phase 1. This habitat constitutes Annex I intertidal mudflats and sandflats (H1140). The mud and sand habitat extends northwards towards the sea covering most of the intertidal area. |

### 5.2.4 Protected and Notable Species

#### 5.2.4.1 **Little tern:**

(See also **Section 6.2.1.Birds**) Liverpool Bay CCS Limited has carried out a review of UK scientific literature, which indicates that little terns are sensitive at nesting colonies but more tolerant when foraging alongshore, where disturbance is less of a concern. Predation by carrion crows and magpies is a major factor in colony failure or low productivity, making predator control an ongoing issue. Poor productivity is due to predation and adverse weather, with some years dominated by predation even at protected sites like Gronant, where carrion crow is a significant threat. Wardening and electric pens help maintain higher productivity at Gronant. Little terns forage in shallow nearshore waters within a few kilometres of the colony, so local vessel activity can be important.

- **Distance:** The CLV is >2 km from the colony. Published guidance on tern disturbance shows breeding-season buffer needs in the order of 0.1–0.3 km from colonies for pedestrian-type stimuli; no evidence suggests disturbance propagates to kilometre-scale from a static source on an open beach.
- **Mechanism:** The principal pathway by which human activity harms little terns is disturbance at or very near the colony (adults flushed from nests/chicks) or repeated disturbance within the near-shore foraging strip that reduces provisioning while the disturbance is present. A single, static CLV >2 km away does not act on either pathway.
- **Foraging geography at the Dee:** Little Tern foraging around the Dee colony is concentrated very close to the colony and within ~1–2 km of the shore; the Liverpool Bay SPA documentation and JNCC analyses show near-shore, short-range central-place foraging. A beached CLV >2 km from the colony and not operating repeatedly along the surf line is outside the sensitive zone where disturbance can materially reduce provisioning.
- **Construction disturbance context:** Where construction has caused measurable bird disturbance in UK estuaries, the highest impacts occur when people/plant are on the mudflat near birds and/or with irregular, high-level impulsive noise—not from a static, predictable presence well away from the birds.

While the evidence shows negligible risk at >2 km, the following Vessel Management protocols will keep risk demonstrably de minimis and aligned with SPA advice:

- **Support craft will be kept away from the near-shore foraging strip in front of the colony** (the first few hundred metres off Gronant Dunes) and stay mid-channel if transiting to/from the CLV. This matches the SPA's recognition of near-shore foraging areas.

- **Slow-speed, no-wake** behaviour for any necessary transits in the Talacre/Gronant sector; where practicable, avoid dawn–mid-morning and late-afternoon/evening provisioning peaks for any unavoidable runs. (These windows are when disturbance has the largest provisioning effect in little tern.)
- **Minimise impulsive noise** (maintain steady acoustic profile) and no foreshore footfall near the colony fencing or roosts.

#### 5.2.4.2 Cetti's warbler

Liverpool Bay CCS Limited can confirm that HDD works at Warren Farm are unlikely to be within 25m of the habitat identified as suitable for Cetti's warbler. Furthermore, the main works in Warren Farm are not scheduled to coincide with the breeding (late March to Mid-April), and peak nesting (April to June) periods for Cetti's warbler.

#### 5.2.2.15.2.4.3 Badgers

Badger surveys were undertaken on August 27th and October 11th 2024 by a suitably qualified ecologist to provide updated baseline information. The scrub habitat present within the Proposed Development provides suitable foraging and sett building habitat for badger. Badgers are also known to build setts in sand dunes. Whilst no setts have been recorded within the HDD Works Area, the presence of badgers at Warren Farm cannot be discounted. An ECoW will be appointed for the site work activities and will carry out checks prior to the commencement of the works.

#### 5.2.2.25.2.4.4 Bats

Surveys carried out in the vicinity of the proposed HDD Entry Pit, and HDD Exit Pit have found no bat activity within 500m of the works areas. Bat foraging was observed around 650m to the south west of the HDD Entry Pit, potentially associated with confirmed bat roosts in farm buildings on Station Road. Regular monitoring of the roosts will be carried out by an ECoW and that if it appears the colony has moved, or is being disturbed by the works, then contractors will follow advice from the ECoW.

Notwithstanding, Liverpool Bay CCS Limited confirms that lighting mitigation measures, to address ecological sensitivities, are presented in **Section 6.3.2** in **Figure 6.1**, **Figure 6.2**, and **Figure 6.3**.

The construction lighting has accounted for the guidance for permanent lighting schemes provided in the *Institution of Lighting Guidance Note 08/23: Bats and Artificial Lighting at Night*. The figures show that lighting is directed towards the tasks being carried out to avoid unnecessary light spill.

#### 5.2.2.35.2.4.5 Summary of Baseline Species and Habitats

**Table 5.5 Summary of Baseline Species and Habitats**

| Species, Species Group or Habitat | Baseline Summary |
|---|---|
| Breeding and wintering birds | Habitats present such as the scattered trees, dense and scattered scrub, and plantation woodland, provide nesting and foraging opportunities for a variety of bird species. Ponds and wet ditches can also act as foraging/roosting and nesting places for waterfowl. Warren Farm remains a working farm with a tenant farmer. Generally, the farm holds grazing cattle during the summer months and sheep during the winter, when the cattle are kept inside various sheds. The fields are designed to be seasonally flooded from September to March via an irrigation system installed when the gas pipeline was laid. The irrigation system was constructed as part of the mitigation works for the PoA gas terminal. As a result, new habitats have been created which, when flooded, are ideal for feeding and roosting waders and wildfowl. The two large, lined ponds are provided for waders and wildfowl throughout the winter period. Wildfowl species usually present include teal, wigeon, |

| Species, Species Group or Habitat | Baseline Summary |
|---|---|
| | mallard, tufted duck, shoveler and pintail. Wader species include curlew, oystercatcher, redshank, lapwing and black-tailed godwit. The hedgerows surrounding the farm support foraging migratory thrush and passerine species such as redwing and fieldfare. The seven key species at Warren Farm are teal, mallard, oystercatcher, golden plover, curlew, lapwing and redshank. A further two species of increasing significance, black-tailed godwit and wigeon have also been included as key species in more recent years. |
| Badger | The scrub habitat present within the Proposed Development provides suitable foraging and sett building habitat for badger. Badgers are also known to build setts in sand dunes. Whilst no setts have been recorded within the Survey Area, the presence of badgers cannot be discounted. An ECoW will be appointed for the site work activities and will carry out checks prior to the commencement of the works. |
| Otter and water vole | There are no watercourses present within the Proposed Development Survey Area. However, the scrub and dune habitat provide suitable foraging and commuting habitat for otters. The presence of otters cannot be discounted due to the suitable watercourses in proximity of the Survey Area.<br>There was no suitable habitat for water voles within the Proposed Development Survey Area. |

#### 5.2.35.2.5 Invasive Non-Native Species

A Biosecurity Risk Assessment and Method Statement is being prepared to satisfy a condition of Marine licence CML2365 and will be submitted to Flintshire County Council, and Natural Resources Wales, related to the cable Lay Vessel (CLV). Adherence to the MARPOL regulations (inspection history), anti-fouling coating and management of ballast water are taken into account to limit introduction or spread of INNS (see **Appendix A**).

### 5.3 Nuisance

#### 5.3.1 Residents and Local Community

Given the location and nature of the project activities they may affect residential properties. The sensitivity of each receptor will depend on their location and proximity to the site and identified transport routes. Potential issues include:

- Mud on roads spread by construction traffic.
- Excessive or poorly directed light.
- Litter.
- Dust and fumes from vehicles and plant.
- Noise and vibration from vehicles and plant.
- Traffic disruption.
- Disruption to business.
- Reduction of access to amenity space.

Given the existing use of the PoA terminal, the project is not expected to cause a permanent nuisance. However, temporary nuisances during construction could occur to the following:

- Talacre Beach Resort and holiday homes.
- Silver Birch Caravan Park.

- Presthaven Beach Resort.
- Residents in Gwespyr Village, Flintshire.

Measures and mitigation for managing nuisances are detailed in **Section 6.3**.

### 5.3.2 Air Quality

Atmospheric emissions will depend on both the potential for emissions (the type of activity and prevailing conditions) and the effectiveness of control measures. Generally, two sources of emissions need to be controlled to minimise the potential for adverse environmental effects:

- Exhaust emissions from site plans, equipment and vehicles.
- Fugitive dust emissions from site activities.

#### 5.3.2.1 **Exhaust emissions from site plans, equipment and vehicles**

The operation of vehicles and equipment powered by internal combustion engines results in the emission of exhaust gases, including nitrogen oxide (NOx), particulate matters ($PM_{10}$), volatile organic compounds (VOC), and carbon monoxide (CO). Emission levels depend on factors like engine type, service history, pattern of usage and fuel composition. While exhaust emissions will occur from site activities, they are not expected to be significant compared to emissions from vehicle movements on surrounding roads. Construction phase traffic will include haulage and construction vehicles, as well as vehicles for workers' commutes.

#### 5.3.2.2 **Fugitive dust emissions from site activities**

Fugitive dust emissions depend on the type and extent of activities, soil type, moisture levels, road surface conditions and weather. Dry weather combined with high winds can increase dust generation. Key activities that may produce dust on site include:

- Earth moving, due to the handling and storage of soil and subsoil materials.
- Movement of heavy site vehicles on dry surfaces.
- Movement of vehicles over surfaces where muddy materials have been transferred off-site (for example, onto public highways).

Measures and mitigation for managing air quality during construction are detailed in **Section 6.3.1**.

### 5.3.3 Lighting

During construction, task orientated lighting will be used in shifts at the lowest luminosity necessary for safe delivery of each task i.e. it will not be continuous. It will be designed, positioned, and directed to reduce the intrusion into adjacent properties and habitats. The exception to this will be at trenchless crossings where 24-hour working will be required for the actual drilling activity. The overall duration of works at each site will be an approximate 4-weeks at each location. It is therefore considered temporary in nature and unlikely to result in significant effects. Control measures and mitigation for managing lighting during the cable laying activities are detailed in **Section 6.3.2.**

### 5.3.4 Noise and Vibration

Noise and vibration from the HDD, and cable laying activities, including equipment and vehicular movements, have the potential for short-term impacts. To manage these, standard construction methodologies are to be employed to control noise and vibration in accordance with current legislation and standards including British

Standard 5228-1:2009+A1:2014: 'Code of Practice for noise and vibration control on construction and open sites – Noise'.

The Control of Pollution Act 1974 (COPA 74) gives local authorities power for controlling noise and vibration from worksites. If deemed necessary by the Local Planning Authority a Section 61 consent may be used to agree on methods, times, durations and noise levels with the client. A Section 61 prior consent would need to be used prior to work starting. The lead period for this to be determined is 28 days, meaning that any application to work outside of the permitted hours, shall be required giving at least 28 days' notice.

Control measures and mitigation for managing noise and vibration during construction are detailed in **Section 6.3.3**.

### 5.3.5 Traffic, Transport and Public Rights of Way

Public Rights of Way (PRoW) include footpaths, bridleways, restricted byways, and byways open to all traffic that are expected to interact with the Proposed Development. The PRoW at the top of Talacre Beach along the base of the dunes will be impacted by cable laying the works on the beach. This PRoW will be signposted to identify a temporary diversion through Talacre Dunes for the periods when access would be restricted during cable laying activities.

Measures and mitigation for managing traffic, transport and public rights of way are detailed in **Section 6.4**.

## 5.4 Water Resources and Flood Risk

The Proposed Development will involve the installation of a marine electrical cable, which is critical for delivering electricity from the onshore grid to offshore infrastructure. This cable will be fully buried under the inter-tidal zone, within a designated flood risk area (**Flood Zone 3** according to the **Flood Map for Planning**), in accordance with operational requirements. Due to the specified route, avoiding this flood zone is not feasible; however, burial of the cable ensures that flood defences will be unaffected, and existing or future flood risk levels at the site are not affected.

Recent revisions to TAN15 requirements and updates to flood mapping have not altered the flood risk associated with this development, as previously assessed for planning permission **FUL/000246/23**. Consequently, no further mitigation measures are required for the fully buried permanent works.

Nevertheless, Liverpool Bay CCS Limited has undertaken a review of the requirements of TAN15 in relation to the works proposed under TCPA application **FUL/000705/25**, and concludes the following:

> *"The proposed HDD cable conduit beneath the dunes at Gronant has been assessed against the requirements of TAN15 and NRW guidance. The permanent elements of the scheme, the buried conduit at approximately 15 m below ground, and cable buried at 2.5-3m in depth across the inter-tidal area, are fully resilient to flooding. They will not be affected by tidal, fluvial, surface water or groundwater flooding, nor will it alter flood storage or flow routes. The only elements at direct flood risk are the temporary entry and exit pits, one of which lies within Flood Zone 3. The construction works are short-term, of limited footprint, and will be managed through appropriate mitigation measures including timing of works, temporary protection, and reinstatement. As such, the development will not increase flood risk elsewhere, will remain safe for its intended use, and will not compromise the*

*function of coastal defences or natural dune systems. The scheme therefore complies with the objectives of TAN15 and Planning Policy Wales in relation to development and flood risk."*

It should be noted that the PoA site operator is registered with the Natural Resource Wales (NRW) Flood Warning system and has implemented an Emergency Response plan that includes protocols for flood risk and emergency situations. This plan enables rapid response to events such as an unlikely breach of tidal flood defences.

The installation of the HDD conduit under Gronant Dunes does not pass under any main river and does not affect, and nor is it within 16 m of, any formal flood defences. There was no objection raised to the application from the Local Lead Flood Authority (LLFA) and the FCC drainage team. The works covered by this CEMP and Planning Application **FUL/000705/25** will not be affecting any watercourse or formal flood defences. The Applicant understands from its reading of Natural Resources Wales / Check if you need a flood risk activity permit (FRAP) and the NRW Technical Guidance (GN 044 Technical Guidance: Flood risk activity exemptions ENG) that it will not require a Flood Risk Activity Permit (FRAP) under the *Environmental Permitting (England and Wales) Regulations (EPR) 2016*, for either the permanent, or temporary works.

### 5.4.1 Flooding from groundwater sources

During the consultation process, the Local Lead Flood Authority (LLFA) advised that the groundwater table is likely to be high. The superficial deposits are composed of tidal and glacial deposits, consisting of a poorly sorted mixture of sandy silt, gravel, clays that coarsen with depth. These deposits are believed to be connected to the wider groundwater table. Groundwater levels at the site are likely influenced by variations in sea levels, though the surrounding landscape may limit the depth of the groundwater table.

### 5.4.2 Interaction with groundwater

The HDD method is a closed, pressurised system designed to avoid surface disturbance, with drilling fluid (water, and bentonite clay) contained and recovered via a sump at the Exit Pit.

Based on the groundwater conditions previously outlined, Liverpool Bay CCS Limited has assessed the potential impact that a 500m long, 0.4m diameter HDD conduit installed beneath the dunes at an average depth of approximately 15 metres below ground level may have on groundwater levels within the dune system.

Given the ground conditions, depth of the HDD conduit, and its 0.4m diameter profile, it is expected to be drilled with minimal impact and is unlikely to form a low permeability barrier. Its effect on groundwater levels in the dune slacks is anticipated to be **negligible** and probably unmeasurable. The primary risks to water levels are related to the execution of the bore, including factors such as fluids, grouting, and pit dewatering, rather than the pipe itself. For this reason, careful management of drilling fluid pressures will be employed during HDD activities, as described in **Section 6.7.2**. Every effort is made to avoid significant fluid losses, as they can interfere with the success of the HDD activity.

The influence of the HDD conduit under Gronant Dunes will therefore be minimal for the following reasons:

- **The HDD conduit represents a tiny obstruction relative to the aquifer.** A 0.4 m diameter cylinder at 15 m depth displaces a very small fraction of the flow field in a thick, high-hydraulic conductivity, sandy dune aquifer. Any up-/down-gradient head perturbation around the pipe decays within a few pipe diameters. Hydraulic gradients to drive groundwater flow are also expected to be very low due to the topography of this coastal location (all close to sea level).

- **Depth of HDD conduit versus existing controls on dune slack water levels.** Dune slack water levels are dominated by seasonal recharge and evapotranspiration and, near the foredune, a weak tidal signal. A small, deep linear feature will not alter those controls in a detectable way.
- **Orientation of HDD conduit to prevailing direction of groundwater movement.** The HDD conduit will be installed perpendicular to the shore. This means that its hydraulic 'shadow' is very thin at ~0.4m in thickness, and the HDD conduit will therefore not act as a cut-off wall. The HDD conduit will certainly have a tiny influence in comparison to the existing 0.3m diameter combined sewer that runs parallel to the shore along the boundary of the dunes and Warren Farm. This existing sewer is not reported to be having any discernible influence at all.
- It is **highly unlikely that the HDD conduit will create a 'preferential drainage path'**. This is because the conduit will be constructed within the groundwater zone, which already hydraulically connects two different head zones (e.g., the up-gradient Entry Pit to the down-gradient Exit Pit). Given that the HDD conduit will use watertight joints, seal the entry and exit interfaces, and continuously monitor fluid pressures, it will not leave the annulus as an open path that could act as a drain, thereby marginally lowering local heads.
- Additionally, the Entry and Exit Pits will be located **<50m outside any dune slacks** and will be temporarily sheet-piled to prevent water ingress. Any dewatering would therefore cause only a very short-term, if any, drawdown in the immediate vicinity of the pits.

The dune slacks at Gronant are characterised by a seasonally fluctuating water table. These areas may experience waterlogging or standing water during winter and spring, with soils tending to dry in summer, depending on local meteorological, and hydrological conditions. It is essential to acknowledge that the slacks form an integral part of the larger dune system, which functions as a unified eco-hydrological entity. Consequently, the HDD conduit, installed perpendicular to the shoreline with a minimal profile, is expected to create only a very limited hydraulic 'shadow' and will not act as a cut-off wall. The conduit is therefore anticipated to have a **negligible** effect on the overall hydrological dynamics of the dune system.

### 5.4.3 Groundwater Management and Monitoring Plan (GWMMP)

#### 5.4.3.1 Overview

Liverpool Bay CCS Limited has prepared, in respect of planning Condition 8 of TCPA **FUL/000246/23**, a Surface Water Management and Monitoring Plan (SWMMP), and Groundwater Management and Monitoring Plan (GWMMP). The SWMMP, and GWMMP gives details of the groundwater monitoring methodology, and the mitigation measures and contingency plans in relation to the PoA and foreshore works, which includes the HDD under Gronant Dunes. The GWMMP measures relevant to the HDD under Gronant Dunes are presented below.

the Groundwater Management and Monitoring Measures in relation to the HDD Works are focussed on managing drilling fluids to prevent 'break out', and release of fluids and drill cuttings into the water environment. These measures are summarised in **Table 5.6** and include the following key elements:

- **Annular pressure monitoring:** Continuously record down-hole annular pressure and fluid discharge rates during both pilot drilling and reaming; discrepancies between pumped and returned volumes indicate losses into aquifer or hydrofractures.
- **Closed-loop containment:** Implement a closed-loop system to capture all drilling returns, with transfer pumps and retention pits, preventing seepage to the surrounding dune groundwater.

- Install **a mini-piezometer**: at a suitable depth, off-alignment, at the northern boundary of Field No. 1 at Warren Farm between the dunes, and the HDD Entry Pit. Log at intervals over one spring–neap cycle **before**, **during**, and **after** works.

**Table 5.6 Summary of Principles for Groundwater Management and Monitoring Plan**

| Design measure | Description |
|---|---|
| **Baseline** | • Install piezometer, collect pre-drill water-level and quality data |
| **Entry/Exit Pit Control** | • Freeboard management, cofferdams/sheet piles, closed-loop fluid containment |
| **Drilling** | • Monitor annular pressure, fluid flow, detect inadvertent returns; use of approved additives |
| **Monitoring Network** | • Piezometer, pressure transducers, visual inspections daily |
| **Contingency** | • Defined thresholds, IR response protocols, regulatory notification procedures |
| **Post-drilling Restoration** | • Decommission wells or grout in place, restore dunes, continued monitoring |

#### 5.4.3.2 HDD Works GWMMP

**1. Pre-construction (Baseline)**

- **Hydrogeological baseline assessment:** Collect baseline groundwater levels, seasonal tides, salinity, hydraulic gradients, and soil permeability beneath dunes and nearshore (**data collected during June/July 2025**).

**2. Groundwater Control During Drilling**

Entry and Exit Pits

- **Pit freeboard management:** Maintain at least a 1-ft freeboard above drilling fluid in both pits to minimise overflow and infiltration risks.
- **Groundwater inflow control:** Install temporary sheet piling cofferdam around the pits, especially the exit pit in the intertidal zone, to minimise groundwater ingress.

Drilling Fluid and Pressure Monitoring

- **Annular pressure monitoring:** Continuously record down-hole annular pressure and fluid discharge rates during both pilot drilling and reaming; discrepancies between pumped and returned volumes indicate losses into aquifer or hydrofractures.
- **Fluid additives:** Use of PLONOR drilling fluids.
- **Closed-loop containment:** Implementation of a closed-loop system to capture all drilling returns, with transfer pumps and retention pits, preventing seepage to the surrounding dune aquifer.

**3. Groundwater and Environmental Monitoring**

Monitoring Network

- Install **a mini-piezometer**: at a suitable depth, off-alignment at the northern boundary of Field No. 1 at Warren Farm. Log at intervals over one spring–neap cycle **before**, **during**, and **after** works.
- **Surface and subsurface observation:** Conduct daily visual inspections, pedestrian surveys of mud or seepage (especially along dunes), looking for inadvertent returns, sinkholes or depressions along the alignment.
- **Record drilling parameters** (loads, torque, pressure, fluid volume), and log visual/field observations after each shift

**4. Contingency & Response Planning**

- **Event thresholds:** Define alert levels—e.g. fluid loss beyond defined parameters, unexpected hydraulic head rise/drop, or detection of fluid in monitoring wells.
- **Immediate response protocols:** Include e.g., shutdown procedures, pressure relief, pilot hole pausing, or re-routing alignment. NRW must be **immediately** contacted (by phoning our 24-hour incident hotline at **0300 065 3000**).
- **Notification lines:** Pre-establish regulatory and client notifications; maintain field logs and operators trained in inadvertent returns protocols

**5. Post-drilling / Restoration**

- **Well decommissioning:** All temporary monitoring point installations will be decommissioned with proper grouting to prevent creating conduits.
- **Surface restoration:** Regrade pits and dune disturbance zones, reinstall vegetation, erosion controls and reseed where necessary.
- **Follow-up monitoring:** Continue water-level and quality monitoring for several months to confirm no residual impacts.

It is unlikely that temporary dewatering is required, however, should extensive dewatering be necessary, the requirement for an abstraction licence will be confirmed. Any abstraction will be managed in accordance with relevant NRW guidance and permitting requirements.

### 5.4.4 Surface Water Management

To prevent discharges of drilling fluid at the Entry and Exit Pits, the HDD contractor will continuously record down-hole annular pressure and fluid discharge rates during both pilot drilling and reaming. Discrepancies between pumped and returned volumes indicate losses into aquifer or hydrofractures. The contractor will also implement a closed-loop system to capture all drilling returns, with transfer pumps and retention pits, preventing seepage to the surrounding dune groundwater. On completion of the works, drilling fluids and cutting will be tankered away for offsite disposal at a registered site in accordance with legislative requirements.

The relevant Pollution Control measures are detailed within this CEMP, and in the CEMP, Surface Water Management and Monitoring Plan (SWMMP), and Groundwater Management and Monitoring Plan (GWMMP) for TCPA **FUL/000246/23**.

No dewatering or discharge is anticipated during HDD activities at Warren Farm. While the HDD Exit Pit will be in the inter-tidal environment, there are no terrestrial surface watercourses located within 150m of the HDD works. Notwithstanding, monitoring checks and inspections will be conducted prior to and during works. If monitoring indicates that current mitigation measures are insufficient, adaptive mitigation strategies will be implemented accordingly.

Liverpool Bay CCS Limited does not foresee the need to seek an abstraction or impoundment licence, as the HDD operations will neither extract water from an underground source, nor alter or remove any impoundment structures. The scope of the HDD activity involves installing a cable conduit beneath the dune system, thereby eliminating the need for an open trench and minimising disturbance to the groundwater. Successful installation of the HDD conduit depends on the careful regulation of drilling fluid pressures to mitigate water loss. Upon completion of the drilling process, the conduit will be sleeved with watertight polyethylene pipework to prevent

water ingress and preserve the integrity of both the conduit and the electrical cable. Given its relatively narrow diameter (approximately 450mm) and position below the water table, it is considered unlikely that the HDD conduit will:

- Impede groundwater flow;
- Establish a preferential pathway for groundwater movement; or
- Influence groundwater levels. It is anticipated that groundwater will flow naturally around the installed conduit.

Notwithstanding, water levels in nearby wells and surface waters will be monitored as part of the CEMP to assess if further mitigation is needed. Dewatering is not a concern for groundwater, and impacts to surface water are expected to be **negligible** since local water bodies are mostly unconnected to groundwater, and up-gradient from the works. Pumped water from dewatering will be discharged at an NRW-approved rate and treated with silt busters for sediment removal. For more details, refer to the WFD at Annex C (Construction Mitigation), and the CEMP, SWMMP, and GWMMP for **TCPA FUL/000246705/235**, which include the HDD works under Gronant Dunes.

## 5.5 Land and Soil

### 5.5.1 Coal Mining

There are no coal mining deposits, or any contaminants associated with coal mining within the area of the HDD activity and the lay of the cable in the intertidal area.

### 5.5.2 Hydrogeology

The superficial tidal flat deposits are classified as Unproductive Strata of low permeability that have negligible significance for water supply or river base flow. Superficial blown sand deposits are classified as a Secondary A Aquifer, formed of permeable layers capable of supporting water supplies at local scale, and in some cases forming an important source of base flow to local watercourses. The underlying bedrock of the Lower and Middle Pennine Coal Measures are classified as Secondary A Aquifers (aquifer properties defined above). The area of works does not lie inside, or within 500m, of source protection zones (SPZs). The River Dee Estuary lies to the, and the Welsh Channel area of the Irish Sea to the north. Measures and mitigation for managing land and soils are detailed in **Section 6.5**.

### 5.5.3 Unexploded ordnance (UXO)

A magnetometer run will be performed via a drone survey farm field, dunes, and the intertidal area. Any targets that are classified as potential UXO (pUXO) and interfering with the work area are removed by Company prior work execution. This would require digging and investigation of the found target by a specialised 3rd party company. As most of the pUXOs are expected to be located on the beach area, uncovering can be done by e.g. excavator and manually by e.g. shovels. After target investigation, the created hole can be backfilled with the same material (i.e. sand). The target itself will be contained and transported off site or requires measures on site. A specialised company will be engaged to remove the UXO.

Explosive Ordnance Clearance (EOC) Engineer support is required for ground investigation works in the area with potential UXO hazards. All staff involved with excavation on site are given a formal UXO awareness briefing.

## 6.0 ENVIRONMENTAL MANAGEMENT PROCEDURES

This section of the CEMP outlines the site-specific control measures identified. These measures will be implemented by the Principal Contractor, and where relevant, by its Subcontractors. Most of mitigation measures comes from national laws and Register of Environmental Actions and Commitments (REAC) associated with the consented planning permission for works at Point of Ayr (**FUL/000246/23)**.

Environmental management measures have been developed to prevent, or where that is not possible, minimise the environmental impacts associated with the works. These measures shall be incorporated into the Risk Assessment and Method Statement (RAMS) prepared by the Principal Contractor, and all RAMS shall be communicated to the workforce.

### 6.1 Archaeology

A draft Written Scheme of Investigation (WSI) was shared with Heneb in July for consultation prior to submitting the planning application. Following feedback received from Heneb, a final WSI has been submitted with the planning application.

The draft WSI has been finalised as '***Project Design for Archaeological Monitoring and Recording – Point of Ayr HDD Cable Installation and Foreshore Works***' (PD). The PD document sets out the required **archaeological monitoring and recording strategy**.

The PD scheme ensures that archaeological remains encountered during construction are **identified, recorded, and appropriately managed** in compliance with local planning conditions, national legislation, and professional archaeological standards.

The Key Elements of the PD are as follows:

- **Legislative Framework:** Compliance with the Historic Environment (Wales) Act 2023, Protection of Military Remains Act 1986, and related planning policies.
- **Archaeological Baseline:** The site has **moderate potential for prehistoric, medieval, and post-medieval remains**; low potential for Roman and early medieval finds. WWII features and aircraft crash sites are known nearby.
- **Methodology:**
    - Supervised mechanical excavation and hand excavation.
    - Recording through written, photographic, and digital methods.
    - Environmental sampling, finds recovery, and specialist conservation as required.
    - Specific protocols for human remains, aircraft crash sites, and unexpected discoveries.
- **Reporting & Archiving:** Findings will be reported to the client and local authority within eight weeks of fieldwork, archived with the National Monuments Record for Wales, and disseminated through professional and public channels.
- **Programme & Staffing:** Monitoring is expected to commence in **February 2026**. Qualified archaeological contractors will be appointed, overseen by an archaeological consultant liaising with local heritage authorities.
- **Health & Safety:** Compliance with CDM 2015 regulations, site-specific RAMS, UXO awareness, and standard PPE requirements.

- **Monitoring & Assurance:** Weekly progress reporting, consultant oversight, and flexibility in construction scheduling to accommodate archaeological discoveries.

The PD establishes a robust framework to safeguard and document archaeological assets during the Point of Ayr HDD and foreshore works. It balances construction requirements with heritage protection, ensuring compliance with statutory obligations and best practice in archaeological monitoring.

A fully illustrated archaeological watching brief report will be made available to LBCCS and the LPA Archaeological Advisor within six weeks of the completion of fieldwork, in accordance with the CIfA standards and guidance (2023a-b) as stated in the WSI developed for this for the HDD and lay of the cable activities.

## 6.2 Ecology

### 6.2.1 Birds

In accordance with REAC measure T-BD-037 (**FUL/000246/23**), if avoiding works completely during the overwintering period is not feasible, where practicable, works would be avoided within a three-hour period either side of high tide each day to minimise the likelihood of disturbing any overwintering birds present nearby. The Contractor keeps a record of tide times as part of ongoing management and monitoring and this would be employed to help plan the works. Notwithstanding, physical screening of the HDD Entry Pit will be employed by a close boarded fence to provide noise and visual screening.

Where practicable, vegetation and site clearance works will be undertaken outside the bird nesting period, recognised as March to August inclusive, to avoid damage or destruction of nests. Where this is not possible, site clearance will be preceded by an inspection from an experienced ECoW within 24 hours of clearance works commencing to confirm the absence of active nests or nesting activity. If an active nest or activity is recorded, the ECoW will determine a minimum exclusion buffer within which no works can take place and will be implemented and remain in place until the nest is confirmed inactive or the nest fails. Should suitable breeding habitat within 25m of the RLB be disturbed during Cetti's warbler's nesting season, pre-construction checks for the presence of Cetti's warbler should be completed. If an active nest or activity is recorded, a minimum exclusion buffer of 25m within which no works can take place will be implemented and remain in place until the nest is confirmed inactive or the nest fails.

**Little tern:** The installation of the HDD Exit Pit on Talacre Beach are currently programmed to avoid most of the little tern breeding season by carrying out the HDD Conduit, and Exit Pit works during February and March 2026;

The planned July cable installation will use a single, stationary cable-lay vessel positioned at MLWS, over 2 km from the Gronant Dunes little tern colony. Existing research on disturbance distances for terns recommends breeding-season buffers of around 100–300 m to prevent pedestrian-related disturbance at colonies; there is no current evidence that static vessels on open beaches cause disturbance at ranges of kilometres.

In UK estuaries, construction has greater documented impacts when people or machinery operate on mudflats near birds or create irregular, high-level impulsive noise, neither of which are characteristics of this project. With appropriate measures for ancillary vessel movements (such as slow speeds, mid-channel routing, and avoidance of peak provisioning times), the project's disturbance risk to the colony's breeding success will be negligible.

Both the Liverpool Bay CCS Limited and external surveys indicate that most disturbance to little terns occurs within the nearshore foraging zone off Talacre/Gronant. This region, extending about 0.2–1 km from the surf along the Welsh Channel, consists of shallow coastal waters where little terns mainly feed. The SPA extension process identified and mapped these significant foraging zones close to the colony. Data from the UK shows that little tern foraging typically takes place within several kilometres of the colony, underlining the relevance of local vessel presence in these areas.

Little terns are most sensitive to disturbance from mid-June to late July, which aligns with the peak period of chick provisioning. During this period, the highest provisioning activity occurs naturally in the early morning and late afternoon or evening. Liverpool Bay CCS Limited also understands that the most significant risks to the little tern colony that currently exists at the Gronant Dunes & Talacre Warren SSSI during the breeding season (April-August) are from predation, leisure users and dog walkers, and disturbance by vessels using the Welsh Channel, which are discussed below:

- **Natural predation:** Recent site reporting notes nest failures carrion crow in poor years; corvid predation is identified by NRW as a key constraint for ground-nesters of conservation concern in Wales. Kestrel, foxes, and stoats are an ever-present threat. However, The local wardening program is credited with Gronant's success in becoming one of the most productive Little Tern colonies in Britain. This programme has shown that wardening and electric pens have been successful at Gronant and underpin the high productivity of the colony.
- **Leisure users and dog walkers:** While no published statistics quantify, for example, 'percentage of nests lost because of dog disturbance' at Gronant, the qualitative evidence indicates that off-lead dogs running through nesting pens have knocked, trampled, or killed chicks in some incidents. These are episodic but potentially catastrophic events: even a single dog in the wrong place at the wrong time (when chicks are unguarded) can knock over nests, expose eggs/chicks to predation, or cause adult abandonment.
- **Marine vessel disturbance in foraging areas:** Studies have identified that little tern reduce provisioning when disturbed; Isle of May fieldwork (Arctic Tern, very similar breeding ecology/behaviour) showed substantial drops in chick feeds while visitors/boats were present, with the strongest effect when disturbance overlapped peak evening feeding. This mechanism of lost feeds during exposure windows is a relevant pathway for little tern foraging just off Talacre.

Liverpool Bay CCS Limited is unable to affect the current pressures on the little tern colony. Nonetheless, both the colony size and breeding success have led to an increase in the number of breeding pairs over recent years. Additionally, the Liverpool Bay CCS Limited planned cable laying and foreshore activities scheduled for late July and early August are not anticipated to exacerbate existing threats to the little tern colony from predators, recreational users, or dog walkers. Project vessel operations within the Welsh Channel, over 2 km from the little tern colony, are expected to have minimal impact on the established vessel movement patterns.

Little terns forage mainly near Gronant Dunes and within 1.5 km offshore. The CLV will conduct cable shore pull operations more than 2.5 km from the colony and 1-1.5 km from peak foraging areas, passing through zones with less than 1.5% foraging activity when laying the cable. These activities are therefore unlikely to have a significant effect on the main threats to the little tern colony from vessel movements.

A single cable lay vessel positioned over 2 km from the Gronant Dunes colony, supported by five small craft operating under slow-speed, mid-channel routing protocols, will not interfere with little tern foraging or expose the birds to the typical threats associated with marine traffic. During the cable shore pull, the vessel is static and located outside the near-shore foraging strip where little terns concentrate their provisioning, so it will not

increase energetic stress or reduce foraging efficiency. With predictable, low-speed transits well offshore, there is no realistic risk of collisions with terns, and the absence of night-time works with bright deck lighting eliminates the potential for disorientation or light pollution.

The operation does not alter predator dynamics onshore, so there is no increased risk of predation, and it does not involve fuel transfers, discharges, fishing activity, ruling out oil spills, chemical contamination, ghost fishing, or bycatch mortality. Finally, with all activities confined to the foreshore well away from the fenced colony, there will be no disturbance at nesting sites. With these safeguards, the operation is demonstrably outside the pathways known to cause harm to little terns.

The site's conservation targets for population size and habitat extent will be maintained, with no significant change expected in bird populations, supporting habitats, or prey availability. No adverse effect on integrity (AEOI) is anticipated for the Dee Estuary SPA/Ramsar site or Liverpool Bay SPA, even before mitigation. A precautionary approach has been adopted regarding little tern, considering potential overlap with their breeding season (mid-July/August 2026).

NRW concluded in its HRA for Marine Licence **CML2365** that the Proposed Activities, alone or in combination with others, are unlikely to harm any SSSI if appropriate conditions are applied. Temporary loss of just 0.167% of little tern habitat during construction will not affect overall habitat extent or bird distributions, and any adverse effects are negligible, so site integrity remains unaffected.

Should construction works take place between April and July inclusive, the ECoW will identify any habitat with the potential to be used for little tern nesting within 300m of the development and check for little tern breeding activity before any works are undertaken.

While the evidence shows negligible risk at >2 km, the following Vessel Management protocols will keep risk demonstrably de minimis and aligned with SPA advice:

- **Support craft will be kept away from the near-shore foraging strip in front of the colony** (the first few hundred metres off Gronant Dunes) and stay mid-channel if transiting to/from the CLV. This matches the SPA's recognition of near-shore foraging areas.
- **Slow-speed, no-wake** behaviour for any necessary transits in the Talacre/Gronant sector; where practicable, avoid dawn–mid-morning and late-afternoon/evening provisioning peaks for any unavoidable runs. (These windows are when disturbance has the largest provisioning effect in little tern.)
- **Minimise impulsive noise** (maintain steady acoustic profile) and no foreshore footfall near the colony fencing or roosts.

Additionally, Liverpool Bay CCS Limited will continue to work with NRW and the local wildlife groups to design and deliver the nature conservation and management activities it currently undertakes around Gronant, and Talacre Dunes.

**Cetti's warbler:** The HDD works at Warren Farm are unlikely to be within 25m of the habitat identified as suitable for Cetti's warbler. Furthermore, the main works in Warren Farm are not scheduled to coincide with the breeding (late March to Mid-April), and peak nesting (April to June) periods for Cetti's warbler.

### 6.2.2 Badgers

The works have been planned to ensure no impact on known badger setts. (See REAC Measures in **Table 6.1**). The badger sett located at the northern boundary Warren Farm with the dunes has been avoided. This sett lies approximately 100m to the west of the HDD Entry Pit and a buffer zone of 30m will be put in place to fence off this area of Warren Farm. Notwithstanding, pre-commencement checks will be carried out by the ECoW. During the works the ECoW will:

- Supervise works near known or suspected setts.
- Check for new burrowing activity.
- Liaise with the site manager and halt works if potential disturbance occurs.
- Undertake regular compliance checks and report findings.

To prevent entrapment of wildlife, where excavations are left overnight, a suitable means of escape will be provided (such as a ramp at no greater than a 45° angle). Any open excavation will be visually inspected prior to re-starting works each morning to confirm the absence of entrapped wildlife. All escape measures will be discussed and agreed with the ECoW to ensure they are suitable for the size of open excavation and wildlife that may become trapped.

Construction materials, fuel, and chemicals will be stored in secure, bunded areas away from watercourses and mammal paths, and the ECoW will ensure that spoil heaps and stockpiles are covered or fenced to prevent burrowing or sheltering by mammals. Where practicable mammal corridors (e.g., hedgerows, field margins) will be maintained to prevent fragmentation.

If these avoidance and mitigation measures prove unsuccessful, and/or the buffer zones cannot be adhered to, a mitigation licence will be obtained from NRW (once planning permission has been granted) to legally permit works affecting the setts.

### 6.2.3 Amphibians and Reptiles

No Amphibians were identified in the area of the HDD Entry Pit, and Exit Pit locations, although natterjack toad, and sand lizard inhabit the sand dunes. However, the installation of the cable conduit under the dunes using the trenchless HDD method will avoid direct impacts on the amphibians and reptiles, and their habitats in the dunes. The depth of the HDD conduit means impacts on protected species within the dunes are not anticipated. This is because, as Natterjack toads typically burrow to depths of less than 50cm (although can be deeper in winter) and sand lizard burrow to up to 1m deep.

Furthermore, to ensure that significant indirect impacts to breeding Natterjack Toads are avoided, the HDD works, likely to cause significant disturbance around Talacre dune system, will be undertaken in February and March, thereby avoiding the Natterjack Toad breeding period (approximately April – July).

A preconstruction survey by an ECoW will be carried out in Warren Farm across the area suitable for GCN in the grassland close to the entry pit. Prior to the works, the grass will be kept mown short at the entry pit to reduce the favourability of the area for amphibians and reptiles and the area will be hand searched by the ECoW prior to works commencing. However, if amphibian or reptile presence is confirmed at any stage of the works, activities must cease and the ECoW contacted for advice on how to proceed. If natterjack toads, sand

lizards or GCN are found during the works, or the ECoW determines that significant disturbance or harm to individuals cannot be avoided, it will be necessary to apply to NRW for a European Protected Species Licence (EPSL) to legally permit works to continue.

### 6.2.4 Habitats

Control measures to protect habitats are included in the REAC Measures in **Table 6.1**).

The works will not require the removal of dense stands of bramble or similar vegetation, which may be used by sheltering hedgehog or other wildlife, particularly during the winter months. However, should the need to remove woody vegetation arise, the material will, where practicable, be used to create hibernacula within appropriate retained habitats rather than being chipped. Locations will be identified by the appointed ECoW during the execution phase.

### 6.2.5 Invasive Non-Native Species

Invasive Non-Native Species (INNS) are present within the sand dunes, and wider PoA area, although have not been identified within the areas where physical HDD and cable installations works will take place. Notwithstanding, biosecurity prevention and control measures will be implemented throughout (*see Invasive Non-Native Species Management Plan included as* ***Appendix A***).

The onshore plant and equipment, and the offshore vessels are highly unlikely to be a source of the amphibian fungus Chytrid. Notwithstanding, Liverpool Bay CCS Limited recognises the importance of preventing the introduction and spread of this amphibian fungus. Especially given that the native UK populations of Natterjack toad that have been tested, have returned positive for the fungi Batrachochytrium dendrobatidis (“Bd”), albeit apparently unaffected.

All plant and equipment, and vessels will be thoroughly cleaned, in accordance with national and international protocols, prior their mobilisation to site, in accordance with the Invasive Non-Native Species Management Plan included as **Appendix A**.

Biosecurity measures include mapping the locations and extent of any INNS identified, alongside appropriate measures to control and prevent spread or propagation of INNS, which include the following:

- Any invasive plant species recorded within the working areas will be demarcated and avoided during the works as far as feasible.
- Any plant, equipment or PPE that comes into contact with invasive plant material will be thoroughly cleaned before being removed from the working area.
- A toolbox talk will be provided to site contractors by a suitably qualified individual on the potential presence of these presence of these species and appropriate actions to be taken.
- Vessels will be required to have an anti-fouling coating, inspection history complying with relevant regulations (MARPOL Regulations) and to manage ballast water.
- Vessels will have anti-fouling coating and adhere to the MARPOL regulations and ballast standards to reduce the risk of INNS being present on the hulls of vessels.
- Compliance of cable lay vessel (CLV) with international marine regulations as adopted by the Flag State, notably the International Regulations for Preventing Collisions at Sea (COLREGs) (IMO, 1972/78) and the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974).

On completion of construction, Liverpool Bay CCS Limited will continue with its long-term habitat management, and the achievement of net benefits for biodiversity, as outlined in the 'Net Benefit for Biodiversity and Green Infrastructure Statement'. Liverpool Bay CCS Limited has included specific habitat and species work programmes that are in addition to the continuing current management practices. These measures involve control of the invasive elm scrub, and skylark breeding population surveys.

**Table 6.1** presents the ecological mitigation and monitoring commitments from the REAC in Planning Permission **FUL/000246/23** that will be implemented during the execution of the Proposed Development.

**Table 6.1 Ecological mitigation and monitoring commitments**

| REAC Ref | Mitigation and monitoring commitment |
|---|---|
| T-BD-004 | The use of horizontal directional drilling (HDD) will ensure that there are no direct impacts to Talacre Brook, the Talacre dune system, and an area of grassland that forms part of the Dee Estuary Ramsar/SPA and the Gronant Dunes and Talacre Warren SSSI. |
| T-BD-005 | Temporary mats will be laid down, where necessary, across the beach between Talacre beach car park and the HDD exit pit. This will be implemented to facilitate access across areas of soft sand, but it will also minimise damage or destruction of the existing habitats along the route. No access will be taken across the dunes. Access to the beach will be through an existing gap in the dunes at Talacre beach car park. |
| T-BD-006 | Some Atlantic salt meadow habitat has colonised the Talacre beach car park. This habitat is a qualifying feature of the adjacent Dee Estuary SAC. The car park is proposed to be used as a compound area during the construction stage of the TCPA Proposed Development, for parking only. Micro-siting is to be employed to avoid impacts to the salt meadow habitat. |
| T-BD-008 | Prior to construction, a team of suitably qualified and experienced Ecological Clerks of Works (ECoWs), will be appointed to support, oversee and monitor the Construction Contractor with the implementation of measures defined within the OCEMP. Multiple ECoWs may be required during construction to ensure appropriate oversight of multiple active works locations. Broadly, the ECoW will:<br>• Provide ecological advice to the Construction Contractor over the entire construction programme, at all times as required.<br>• Undertake or oversee pre-construction surveys for protected species in the areas affected by the TCPA Proposed Development.<br>• Monitor ecological conditions during the Construction Stage to identify additional constraints that may arise as a result of natural changes to ecological baseline over time, e.g., the monitoring of badger activity within and in close proximity to construction works.<br>• Provide ecological toolbox talks to site personnel to make them aware of ecological constraints and information; highlight mitigation to minimise impacts; and make site personnel aware of their responsibility with regards to wildlife and sensitive habitats in the context of legislation and policy. Toolbox talks will include, as required, all ecological receptors considered within the ES as a minimum.<br>• Monitor the implementation of mitigation measures during the Construction Stage to ensure compliance with protected species legislation, licensing, and commitments within the ES. The ECoW will have previous experience in similar ECoW roles and be approved by the Applicant. The ECoW will be appointed in advance of the main construction programme commencing to ensure pre-construction surveys are undertaken and any advance mitigation measures required are implemented. |
| T-BD-010 | Micro siting of Localised Compounds, the Equipment Yard and the Centralised Compound will be employed to minimise habitat loss and disturbance. |
| T-BD-017 | In relation to accidental pollution events resulting from spills, pollution prevention measures are provided within the OCEMP and REAC and will be used by the Construction Contractor to prepare a detailed CEMP to be implemented during the works to ensure that pollution events do not occur. Further pollution prevention measures are referred to within the separate marine licence application. |
| T-BD-018 | Localised Compounds and storage areas to facilitate construction of the TCPA Proposed Development have been sited on the flat areas of bare earth, which will be subject to a pre-construction ecological walkover, owing to the ecological sensitivities of this area. |
| T-BD-020 | The two active subsidiary badger setts located within the Foreshore Works area will be avoided in the first instance with a minimum buffer zone of 30m in place around the setts for heavy machinery. Where |

| REAC Ref | Mitigation and monitoring commitment |
|---|---|
| | lighter machinery is used, the buffer will be reduced to 20m. Works that are to be carried out using hand tools will have a buffer of 10m from an active sett.<br>In the event that avoidance is not feasible and/or the above buffer zones cannot be adhered to, a mitigation licence will need to be obtained from NRW (once planning permission has been granted) to legally permit works affecting the setts. If direct impacts to the setts cannot be avoided, they will need to be closed under the licence and any badgers present excluded before works commence. A licence application will need to be submitted, containing sufficient information and justification for the sett closure to allow NRW to grant a licence for the works.<br>• Mitigation licences in relation to badgers are only valid between July and November (inclusive) in any given year. Works affecting setts cannot legally be carried out outside of this time period, other than in exceptional circumstances, as approved by NRW.<br>• Once the licence has been obtained, all entrances on the setts will need to be blocked with one-way gates to allow any badgers present to exit the setts but not re-enter. Suitable chain-link netting will also be used to block off any areas around the entrances holes to avoid badger excavating new entrances.<br>• Once the gates and netting have been installed, the setts will be monitored with camera traps for a minimum of 21 consecutive days to confirm that any badgers present have vacated. When 21 consecutive days have passed with no evidence of any badgers using the setts, the setts can be considered vacant and can then be closed via excavation and back-filling, or be left in situ.<br>• Depending on time elapsed between the most recent badger surveys to date and the application for the badger mitigation licence, update surveys are likely to be required to update the status of the setts and ensure that any survey information used as part of the licence application is accurate.<br>• Both setts have been identified as subsidiary setts and there are no main setts to be affected. Therefore, provision of a compensatory artificial sett is not currently considered necessary, but this could potentially be subject to change depending on the outcome of any update surveys prior to the licence application. |
| T-BD-023 | To prevent entrapment of wildlife, where trenches or voids are to be left overnight, a suitable means of escape will be provided (such as a ramp at no greater than a 45° angle) at regular intervals along the excavated trench channel/excavations. Any void/trench channel should be visually inspected prior to re-starting works each morning to confirm the absence of entrapped wildlife. All escape measures will be discussed and agreed with the ECoW to ensure they are suitable for the size of void and wildlife that may become trapped. |
| T-BD-032 | Invasive Non-Native Species (INNS) are present within the Red Line Boundary, including Crangonyx pseudogracilis/floridanua, Physella sp., signal crayfish or New Zealand mud snails . A Biosecurity Method Statement will be implemented throughout the construction of the TCPA Proposed Development. The Biosecurity Method Statement will detail the locations and extent of any INNS identified, alongside appropriate measures to control and prevent spread or propagation of INNS. High-level recommendations for the treatment and removal of INNS will be identified, and will include the following:<br>• Prior to the start of works, an updated survey of all terrestrial working areas will be undertaken by a suitably qualified person to map the current extent of INNS. This must be carried out during the main vegetative growing season (April –September) to allow for maximum visibility of any plants present and ensure that their extents are fully captured.<br>• Any invasive plant species recorded within the working areas will be demarcated and avoided during the works as far as feasible.<br>• The non-native invasive entire-leaved cotoneaster will be removed from the Point of Ayr colliery site<br>• Where complete avoidance of invasive species (INNS) within working areas may not be feasible, an appropriate treatment and removal programme (appropriate to the specific species in question) will be agreed and implemented and an INNS management plan will be produced, prior to any construction works being carried out.<br>• A separate INNS management plan will be produced for the intertidal works and will include the methods to avoid the spread of INNS via marine vessels used during the construction phase.<br>• Any plant, equipment or PPE that comes into contact with invasive plant material will be thoroughly cleaned before being removed from the working area. |
| T-BD-034 | Works within the intertidal area and around waterbodies and watercourses will follow best practice pollution prevention measures, as detailed in the CEMP, to avoid significant impacts on notable aquatic macroinvertebrates that may be using these habitats. Vibration reduction measures on plant and equipment, as detailed in the CEMP, will be implemented at all times and works kept to as short a duration as possible in order to minimise indirect disturbance. |

| REAC Ref | Mitigation and monitoring commitment |
|---|---|
| T-BD-035 | Where practicable vegetation and site clearance works will be undertaken outside the bird nesting period, recognised as March to August inclusive, to avoid damage or destruction of nests. Where this is not possible, site clearance will be preceded by an inspection from an experienced ECoW within 24 hours of clearance works commencing to confirm the absence of active nests or nesting activity. If an active nest or activity is recorded, a minimum exclusion buffer of 5 m within which no works can take place will be implemented (exclusion buffer size will be at the discretion of the ECoW and in response to the species of bird encountered) and remain in place until the nest is confirmed inactive (either eggs hatch and chicks have fledged, or the nest attempt fails).<br>All cleared vegetation will be rendered unsuitable for nesting birds, for example, by covering or chipping depending on the purpose of the vegetation or will be removed from the works area. |
| T-BD-036 | To avoid disturbance to flocks of non SPA-qualifying species at Warren Farm, including the Birds of Conservation Concern (BoCC) red-listed lapwing and amber-listed wigeon, works within Warren Farm will be carried out outside of the typical wildfowl wintering period, as far as practicable. |
| T-BD-037 | To minimise the likelihood of pollution events affecting GCN terrestrial habitat, best practice measures will be followed during construction, as detailed in the CEMP.<br>With regard to vibrational disturbance, any groundworks (including the HDD) will avoid the GCN hibernation season (typically October/November – March, depending on weather and temperature), as far as practicable, to avoid significant disturbance of any hibernating newts. Where any suitable GCN habitat will not be directly affected but may still incur vibrational impacts, appropriate vibration reduction measures will be employed to the extent possible.<br>In the event that GCN presence is confirmed at any stage, works must cease and the ECoW must be contacted for advice on how to proceed. |
| T-BD-038 | To minimise the likelihood of pollution events affecting GCN terrestrial habitat, best practice measures will be followed during construction, as detailed in the CEMP.<br>With regard to vibrational disturbance, any groundworks (including the HDD) will avoid the GCN hibernation season (typically October/November – March, depending on weather and temperature), as far as practicable, to avoid significant disturbance of any hibernating newts. Where any suitable GCN habitat will not be directly affected but may still incur vibrational impacts, appropriate vibration reduction measures will be employed to the extent possible.<br>In the event that GCN presence is confirmed at any stage, works must cease and the ECoW must be contacted for advice on how to proceed. |
| T-BD-040 | To minimise the likelihood of significant impacts on terrestrial invertebrate species of conservation concern, details of dust mitigation and pollution prevention in the CEMP will be followed at all times during works around the Talacre dune system. |
| T-BD-041 | To ensure killing or injury of species such as common toad, common reptile and other mammals, is avoided during site clearance, a PWMS will be produced prior to the works, detailing how clearance works will be undertaken to minimise impacts.<br>Clearance works will be directly supervised by an ECoW, who will provide a toolbox talk to site contractors prior to any works being carried out. If any common toads, common reptiles and other mammals are found during clearance, the ECoW will carefully move them to a safe location outside of the areas of works, or they will be allowed to move off of their own accord.<br>All works will be carried out in accordance with measures detailed in the CEMP, with appropriate vibrational controls on machinery and best practice followed in relation to pollution prevention. |
| T-BD-042 | Details of proposed mitigation measures to protect the Natterjack Toad include:<br>• HDD beneath the Talacre dune system to avoid direct loss of breeding ponds and suitable terrestrial habitat, as well as minimising disturbance and the potential for habitat fragmentation and hydrological effects;<br>• where practicable avoidance of works causing significant disturbance during the natterjack toad breeding period (approximately April – July);<br>• application to NRW for an EPSL to legally permit works likely to disturb natterjack toads if significant disturbance cannot be avoided during the breeding season, alongside appropriate mitigation measures to limit disturbance;<br>• best practice measures for pollution and dust controls to minimise the likelihood of habitat degradation during construction;<br>• precautionary hand searches of any areas of the PoA Terminal that natterjack toads could feasibly access but are unlikely to be present; and<br>• any further measures required to mitigate against the heat effects of the pipeline during the operational stage. These will be determined during further studies being commissioned by the |

| REAC Ref | Mitigation and monitoring commitment |
|---|---|
| | Applicant, the results of which will be finalised during the determination stage of the Planning Application. |
| T-BD-043 | In addition to implementing the above during construction and operation, the Construction Contractor will also continue to monitor the PoA terminal for calling natterjack toad as part of their on-going surveys. This will be carried out in accordance with the Management Plan for Talacre Dunes and The Warren, in which natterjack toad are mentioned as a specific feature for monitoring. |
| T-BD-047 | The HDD exit pit falls within the intertidal working area, directly adjacent to the embryonic shifting dune habitat. At the exit pit, a 10m3 containment sump will be present to contain any spillage of any drilling fluid. To further avoid potential contamination by drilling fluid, minimal use of a plant-friendly alternative to bentonite, which will be contained within the working area, will be used during HDD. Drilling mud will be cleaned up by hand using hand shovels, buckets, and soft-bristled brooms, minimising damage to existing vegetation. This will form part of wider pollution prevention measures, which will be detailed in the CEMP. |
| T-BD-048 | The HDD exit pit falls within the intertidal working area, directly adjacent to the embryonic shifting dune habitat. At the exit pit, a 10m3 containment sump will be present to contain any spillage of any drilling fluid. To further avoid potential contamination by drilling fluid, minimal use of a plant-friendly alternative to bentonite, which will be contained within the working area, will be used during HDD. Drilling mud will be cleaned up by hand using hand shovels, buckets, and soft-bristled brooms, minimising damage to existing vegetation. This will form part of wider pollution prevention measures, which will be detailed in the CEMP. |
| T-BD-049 | In order to reduce impacts on bird species (Little Tern, Redshank, Teal, Pintail, Oystercatcher, Dunlin, Black-tailed Godwit and Curlew) in the DEE Estuary SPA/Ramsar and Mersey Narrows and North Wirral Foreshore Ramsar:<br>Mitigation will involve avoidance of construction works during periods of significant numbers or levels of activity of these species within the potential disturbance distance buffer of 300m from works. The requirement for this mitigation will be informed by an ECoW, who will monitor the bird activity within this buffer in relation to time of year and state of tide. Where practicable, avoidance of sensitive periods of the year will be implemented when birds from European sites are likely to be present in significant numbers, and the construction period will be limited to the minimum practicable time for completing the works in order to minimise the duration of any significant impacts. Any risk of disturbance would be monitored and works will cease completely until such time that the bird species are no longer within the Zone of Influence, if such a threat exists.<br>Temporal restrictions outlined here will broadly cover the period of September to March, inclusive. To avoid potential disturbance of bird species associated with the European sites, works should take place between April and August, where practicable. However, if this is not feasible and works must be carried out between September and March, this can only be carried out under supervision of the ECoW. As a general rule, no ECoW supervision would be required between April and August; however, a watching brief would be undertaken by the ECoW in relation to the established Little Tern colony if any construction works are to be undertaken around the PoA Terminal between April and July, inclusive. If any birds are showing disturbance behaviour within the 300m buffer zone during any stage of the works, the ECoW would stop work until it can be determined that disturbance has subsided. Full details of the mitigation will be written into the CEMP. |

### 6.3 Nuisance

Mud, dust, noise, light, litter and water pollution must be minimised to prevent complaints or environmental degradation of the surrounding area. The following processes and procedures shall be implemented to manage potential nuisance issues.

#### 6.3.1 Air Quality

The following best practice measures for controlling dust and mud on worksites represent the dust management plan for the works and will include:

- Follow Control of Dust from Construction Sites (BRE DTi Feb 2003).
- Use dust barriers/fencing for significant dust-generating activities.

- Plan earthworks to minimize handling and traffic movements.
- Limit soil stripping and stockpiling; keep site roads clear of debris.
- Park all vehicles in designated areas.
- Reduce or postpone work if dust levels remain high despite controls.
- Use water to dampen dusty materials and maintain vehicles to prevent mud build-up.
- Manage washdown facilities to control contaminants.
- Locate machinery away from sensitive receptors when possible.
- Enclose operations likely to produce high dust levels.
- Use hoarding to contain dust and consider green/vegetated hoarding.
- Use hard-surfaced or damped-down haul routes, cover stockpiles, and reduce drop heights.
- Cover loads entering/leaving the site and use mechanical sweepers as needed.

### 6.3.2 Light pollution

Once construction of the Proposed Development is complete, there will be no permanent lighting, as there is no above ground infrastructure. The construction lighting has accounted for the guidance for permanent lighting schemes provided in the *Institution of Lighting Guidance Note 08/23: Bats and Artificial Lighting at Night*. Temporary construction lighting will be required for the HDD Entry Pit at Warren Farm; for the HDD Exit Pit on Talacre Beach; and for the cable installation on Talacre Beach. **Figure 6.1**, **Figure 6.2**, and **Figure 6.3** show the proposed arrangement of the construction lighting. These figures show that lighting is directed towards the tasks being carried out to avoid unnecessary light spill and incorporate the best practices as follows:

- Follow BS EN 12464-2:2014 for lighting of outdoor workplaces.
- Turn off lighting when not in use, unless needed for safety or security.
- Use inward-directed, horizontally-mounted lights to reduce glare.
- Install temporary lights with full cut-off or shielding to contain illumination.
- Adjust lighting after installation to minimise light spill and avoid shadows on footpaths.
- Direct lighting below the horizontal plane to reduce spillage.

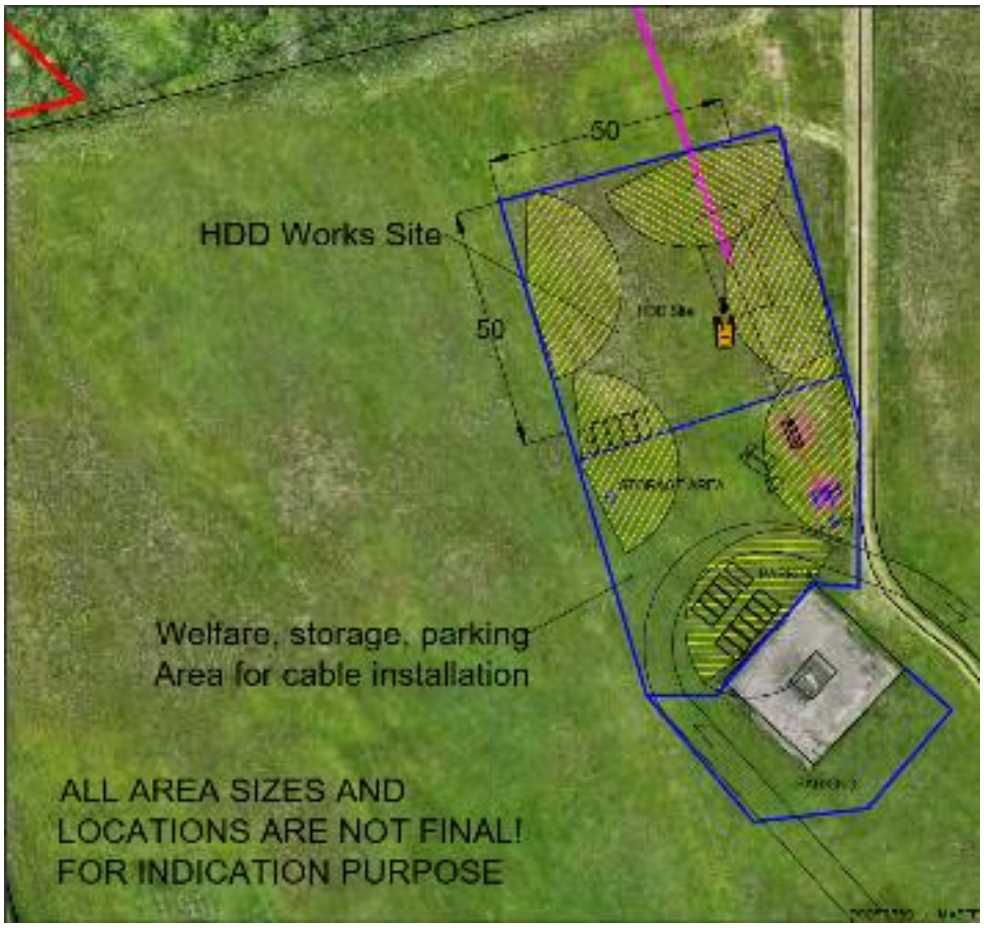


**Figure 6.1: Indicative proposed lighting scheme during construction at HDD Entry Pit**

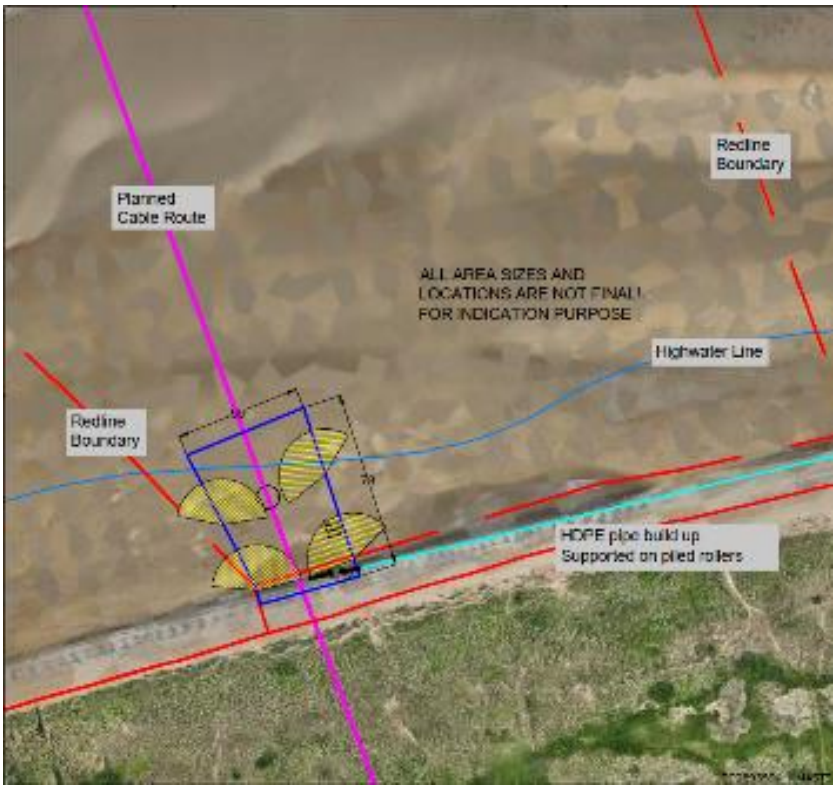


**Figure 6.2: Indicative proposed lighting scheme during construction at HDD Exit Pit**

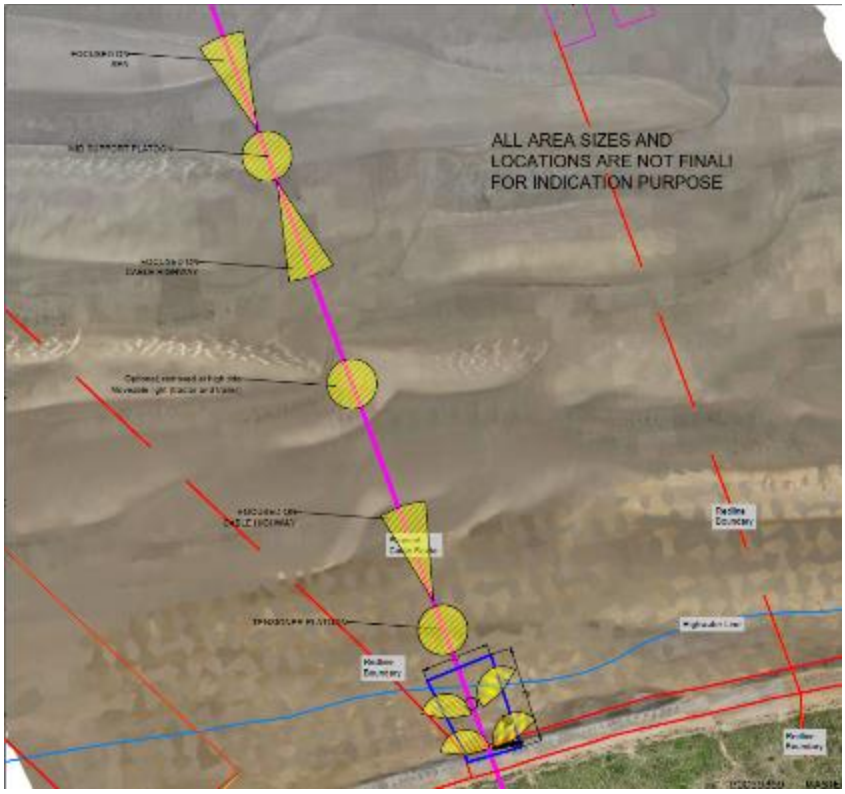


**Figure 6.3: Indicative proposed lighting scheme during cable installation**

### 6.3.3 Noise and Vibration

#### 6.3.3.1 **Best Practicable Means**

This section represents the noise and vibration management plan for the works. It presents the Best Practicable Means (BPM) that will be implemented for the construction activities proposed. The proposed control measures are in line with the REAC. All REAC References are complied with in full. **Table 6.2** presents the mitigation and monitoring commitments from the REAC in Planning Permission **FUL/000246/23** relevant to the control and management of noise and vibration that will be implemented during the execution of the Proposed Development.

**Table 6.2 Noise and vibration mitigation and monitoring commitments**

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-NV-003 | After current design, and before the commencement of the construction period, a Noise and Vibration Management Plan will be produced and agreed with the Local Authority setting out the requirements for noise and vibration mitigation measures |
| T-NV-004 | The Construction Contractor will nominate a Community Liaison Representative (or equivalent title) who will be a nominated competent site contact for whom the contact details will be shared with local residents and other third parties within close proximity to the construction works, and will be displayed clearly within the site compounds. |
| T-NV-005 | Construction works will utilise low noise generating plant and equipment and will adopt methods which minimise noise and vibration, wherever practicable. |
| T-NV-006 | Where required, temporary acoustic barriers will be considered around significant noise producing plant that are in close proximity to sensitive receptors. The locations of these screens will be optimised for acoustic mitigation whilst considering other potential impacts. |
| T-NV-007 | Optimal location(s) of all equipment with the potential to cause a significant effect on noise on site will be agreed with the Local Authorities as part of the Noise and Vibration Management Plan prior to construction to minimise noise disturbance to local sensitive receptors. |
| T-NV-008 | During construction, the Construction Contractor will ensure that the provision of acoustic enclosures around static plant, where practicable, is in place to reduce noise disturbance. |
| T-NV-009 | Construction vehicles will, wherever practicable, be fitted with less intrusive warning alarms, such as broadband vehicle reversing warnings. |

Best Practicable Means as defined in Section 72 of the Control of Pollution Act 1974 and BS 5228-1: 2009+A1: 2014 shall be employed at all times to reduce noise to a minimum.

The Contractor shall ensure that the following guidelines will be applied where applicable:

- The HDD Entry Pit will be hoarded by a close boarded fence to provide noise and visual screening;
- Whenever possible, noisy plant will be situated away from sensitive receptors;
- Although not included in the current programme of works, if any tasks are proposed for night-time or weekend periods (previously agreed with the EHO), noisy activities will take place during the daytime periods as far as is possible;
- Whenever possible fabrication will be undertaken off site;
- Where reasonably practicable, fixed items of construction plant will be electrically powered in preference to diesel or petrol driven;
- As far as reasonably practicable, the noise from reversing alarms will be controlled or limited. This will be undertaken through following a hierarchy of techniques:
    - The site layout will be designed to minimise reversing;
    - Banksmen will be utilised to avoid so far as reasonably practicable the use of reversing alarms;

  - Reversing alarms will incorporate where reasonably practicable features such as broadband signals or 'smart alarms' to reduce the level of noise.

- Where an enclosure is available it should be used;
- Where reasonably practicable, vehicles and mechanical plant associated with the construction works will be fitted with effective exhaust silencers and shall be maintained in good working order;
- Machines and vehicles in intermittent use will be shut down or throttled down to a minimum during periods between works;
- Screens such as reflective acoustic cladding and louvered screens are recommended to be placed around power units such as compressors, lighting rigs and generators;
- Mobile screens will be placed around noisy hand-held equipment i.e. breakers, Stihl saws etc.
- Letter drops will be undertaken prior to any noisy works commencing that could affect local residents, this will be undertaken a minimum of two weeks in advance of the works;
- Where possible, all deliveries to support non-core works will be completed within core working hours;
- The movement of delivery materials outside of normal working hours shall be kept to a minimum and handled in a manner that minimises noise (i.e. manual handling rather than mechanical);
- All plant, equipment and noise control measures applied to plant and equipment shall be maintained in good working order and operated such that noise emissions are minimised as far as reasonably practicable;
- Where breaking out activities are necessary the continuous use of percussive or impact breaking equipment/ methods should be minimised;
- All employees shall be provided with an appropriate induction and ongoing briefings regarding the management of environmental issues. This will involve emphasising the need for employees to show consideration to the sensitive receptors, including residential neighbours. They will be briefed on not generating unnecessary noise when on site or when leaving and arriving;
- Two-way radios to be used on site to avoid shouting; and
- All works will comply with all plant/equipment to be used listed within this application.

The above Best Practice will be briefed to all parties via:

- Site Induction;
- Toolbox talks;
- Start of Shift briefings; and
- Respite periods are provided for intensive works. This should take account of the temporal thresholds for noise insulation and temporary re-housing eligibility (i.e. 10 exceedances in 15 days, 40 exceedances in 6 months).

Additional BPM measures are also to be implemented. BPM measures are only displayed below when not mentioned in the BPM above.

- All compressors and generators shall be 'sound reduced' models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers. (if possible).

- Noise emitting equipment which is required to run continuously shall be housed in a suitable acoustic enclosure.
- Temporary noise barriers shall be used to reduce noise levels where appropriate and practicable. Barriers shall be located as close to the plant as possible and shall have a mass per unit area of at least 7kg/m2.
- No deliveries shall arrive at the site before 0700 hours unless agreed with the local authority under exceptional circumstances.
- The engines of all parked vehicles or vehicles waiting to enter any work area shall be switched off within two minutes of arrival.
- Work compounds shall be laid out so that accesses and loading areas are located as far away from sensitive neighbours as practicably possible and so that temporary structures screen noisy areas where practicable.
- Stationary plant such as pumps, compressors and generators shall be situated as far as possible from residential property and acoustic screens erected if required. Other plant and machinery shall be screened if necessary.
- Plant known to emit noise strongly in one direction shall be, where practicable, orientated so that noise is directed away from noise-sensitive areas.
- A speed limit of 10mph shall be set and enforced on all site traffic.
- Haul routes shall be maintained in good condition to minimise 'body slap' of vehicles.

Vibration specific measures are recommended to be implemented:

- Reducing the use of percussive or impact-based demolition equipment (e.g., jackhammers, breakers) wherever possible.
- Exploring alternative demolition techniques, such as cutting, crushing, or dismantling, which generate less vibration than impact methods.
- Using vibration-reducing demolition equipment or attachments, such as hydraulic crushers or shears, to minimise vibration transmission.
- Employing modern equipment with built-in vibration-damping features.
- Establishing vibration monitoring systems at sensitive receptors (e.g., residential areas or heritage buildings) during demolition activities to ensure levels remain within acceptable thresholds.
- Planning the sequence of demolition to minimise cumulative vibration. For example, starting with structures or elements that are less prone to transmitting vibrations to nearby receptors or phasing demolition activities to reduce simultaneous vibration sources.
- Positioning demolition equipment and plant as far as possible from sensitive receptors to reduce transmitted vibrations.
- Preparing haul routes and access roads to ensure vehicles moving demolition debris do not generate excessive ground vibrations due to uneven surfaces or "body slap."
- Taking additional precautions, such as increased monitoring, for such structures.

#### 6.3.3.2 **Construction noise predictions**

The potential impacts on sensitive receptors from construction noise during the execution of the HDD and foreshore works are set out below. The main noise generating activities would be the HDD under the dunes, installation of sheet piles to create a cofferdam, and burial of the electrical cables on Talacre Beach using a cable trencher.

The likely number of properties subject to each magnitude of noise level has been determined based on noise modelling. The results of the noise survey show that, based on the existing ambient noise levels presented in **Table 6.3**, receptors fall within BS 5228-2 Assessment Category A.

**Table 6.3 Ambient noise levels at noise monitoring locations**

| ID | Day | | Evening | | Night | |
|---|---|---|---|---|---|---|
| | Average $L_{Aeq}$ | Range $L_{Aeq}$ | Average $L_{Aeq}$ | Range $L_{Aeq}$ | Average $L_{Aeq}$ | Range $L_{Aeq}$ |
| LT17 Warren Farm | 53 | 38-68 | 42 | 33-50 | 45 | 29-65 |
| LT18 Station Road | 54 | 48-61 | 47 | 42-55 | 49 | 40-58 |

**Table 6.4** presents the likely number of receptors subject to an adverse noise impact. Particularly, impacts of medium and high magnitude have the potential for significant effects depending on the duration of the specific activity at that specific location.

**Table 6.4 Numbers of receptors affected by construction noise**

| Activity | Magnitude | Day | Evening | Night |
|---|---|---|---|---|
| HDD under dunes | Negligible | 184 | 116 | 114 |
| | Low | 14 | 76 | 71 |
| | Medium | 2 | 6 | 7 |
| | High | 3 | 5 | 11 |
| Cable burial in Intertidal area | Negligible | 200 | N/A | N/A |
| | Low | 3 | N/A | N/A |
| | Medium | 0 | N/A | N/A |
| | High | 0 | N/A | N/A |

It can be seen from **Table 6.4** that, in the absence of mitigation, there will be medium and high magnitude noise impacts during HDD for the Foreshore Cables. During all other construction activities, only negligible and low magnitude noise impacts are predicted.

HDD for the Foreshore Cables, will require 24-hour working, including evening and night-time periods when a higher number of receptors will be subject to medium and high adverse noise impacts.

The estimated schedule for all works associated with the HDD is 4 weeks. This includes setup and demobilisation. However, it is estimated that night-time activities, within this 4-week period, to facilitate the cable pulling, and HDD drilling will require two to three consecutive nights (48-hour period) each. Therefore, it is considered unlikely that high and medium magnitude night-time noise impacts will exceed the duration criteria in BS5228.

**Table 6.5 Predicted noise levels at biodiversity receptors during construction**

| Activity | Noise Level $L_{Aeq}$ dB | Day |
|---|---|---|
| | Dee Estuary SPA - Little Tern Colony | Warren Ponds |
| HDD under dunes | 45 | 57 |
| Cable burial in intertidal area | 43 | 46 |

Regarding the overwintering birds that utilise Warren Farm. Analysis of annual bird counts, for the period 2021-2025, organised by the Eni PoA Land Manager, show that during February and March, there is a very low level utilisation by birds of Fields 1a, and 1b, where the works will be located. Upwards of 97% of the birds utilising

Warren Farm during February and March would be found in Fields 4, 5, 7, and 8. **Figure 6.4** shows the location of the fields at Warren Farm.

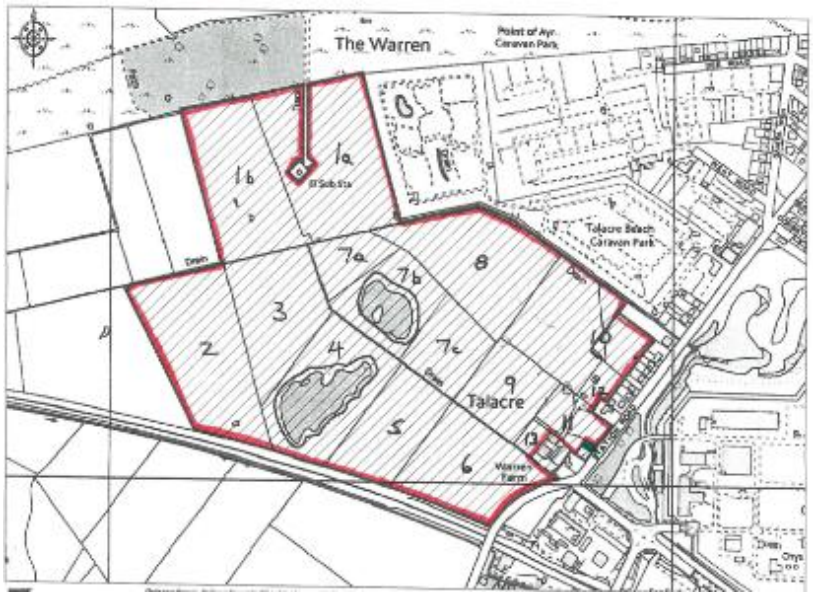


**Figure 6.4: Map showing field numbers at Warren Farm managed to attract over-wintering birds**

From this analysis, the Eni PoA Land Manager has proposed that while the HDD works are carried out in February – March 2026, then Fields 5 and 6 could be flooded, instead of Field 7 to attract the over-wintering birds to the fields outside of the 300m buffer from the proposed works.

6.3.3.3 **Noise monitoring**

The sound level meter used should be of Type 1 classification in accordance with BS EN 61672:-1:2003 'Electroacoustics. Sound level meters. Specifications'. The calibrator used conforms to the requirements of BS EN IEC 60942:2018 'Electroacoustics, Sound calibrators'.

The meter should be capable of recording the following parameters:

- $L_{Aeq}$, 15 min;
- $L_{A90}$, 15 min;
- $L_{A10}$, 15 min; and
- $L_{Amax}$, 15 min.

The sound level meter and associated calibrator will have been calibrated to international standards within the previous year. The sound level meter will be field calibrated before and after each measurement.

It is proposed that noise monitoring positions will be established at locations considered to be representative of the nearest sensitive receptors to the construction site.

The specific location of the sound level meter should be chosen in accordance with the following:

- Locations should be representative of the noise environment of the relevant receptor;

- Locations should not be obscured by buildings of structures where there is a clear line of site between the construction works and the receiver;
- Locations should be a minimum of three meters from any reflective surfaces, screens (e.g. houses, solid fences, vehicles);
- Locations should be away from noise sources that do not represent the construction noise and vibration at the most exposed facade, or sources which unduly mask construction noise;
- Locations should be away from areas where cattle or wild animals could interfere with the meter; and
- Microphone should be positioned 1.5 m in height from relative ground.

Measurements will be undertaken in accordance with BS 7455-1:2003 'Description and measurement of environmental noise. Guide to quantities and procedures'. Noise measurements will be undertaken under meteorological conditions conducive to environmental noise monitoring. This will include low wind speeds (<5m/s) and dry conditions.

### 6.3.4 Residents and Local Community

Liverpool Bay CCS Limited will conduct proactive community engagement prior to the commencement of the works. This will focus on the receptors identified within this document. Community engagement will be conducted through a combination of community newsletters (postal and email), posters and boundary notifications (contact details) and project websites. The following information will be made available to the surrounding community at the commencement of the project (overview of project) and prior to any high impact activity:

- Project overview;
- Start and duration of works;
- Proposed working hours;
- Steps being undertaken by the team to control noise and vibration;
- Informing the community about high noise or vibration demolition activities, particularly for sensitive periods or structures, and providing advance notice of the timing;
- Any work which might be required out of specified working hours; and
- A helpline for queries and complaints.

### 6.3.5 Nuisances control measures

**Table 6.6** presents the mitigation and monitoring commitments from the REAC in Planning Permission **FUL/000246/23** relevant to the control and management of potential nuisances that will be implemented during the execution of the Proposed Development.

**Table 6.6 Nuisances mitigation and monitoring commitments**

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-PD-005 | Construction lighting will follow BS EN 12464 (Parts 1 and 2) and guidance notes from the Institution of Lighting Professionals. In general, lighting will be used in shifts at the lowest luminosity necessary for safe delivery of each task i.e. it will not be continuous. It will be designed, positioned, and directed to reduce the intrusion into adjacent properties and habitats. The exception to this will be at trenchless crossings where 24-hour working will be required. |

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-PD-008 | Access for pedestrians along the foreshore will be maintained where possible and safe between Station Road and the dunes. Where this is not possible or safe, temporary diversions will be arranged for pedestrians. |
| T-PD-012 | The Construction Contractor(s) will be responsible for obtaining all required environmental permits, licences and consents from the relevant authorities where required. |
| T-PD-014 | Materials excavated for the trenching work will be stockpiled adjacent to the trenching work itself and reused during backfilling of the trenches. |
| T-PD-016 | Temporary track mats will be placed along the Foreshore Area to facilitate vehicle movements over the soft sand as necessary. |
| T-CA-001 | Trenchless methods to be used to install cables beneath Station Road and the Gronant Dunes and Talacre Warren SSSI. |
| T-AQ-001 | The Stakeholder Communications Plan that includes community engagement will be implemented before work commences on site. |
| T-AQ-002 | The name and contact details of person(s) accountable for air quality and dust issues will be displayed on the Site boundary and within site cabins. This may be the environment manager/engineer or the Site manager. The head or regional office contact information will also be displayed. |
| T-AQ-003 | The Dust Management Plan (DMP) will be implemented on site by the Construction Contractor. This will include measures to control other emissions, in addition to dust and PM10 mitigation measures. |
| T-AQ-004 | All dust and air quality complaints will be recorded, and causes identified. Appropriate remedial action will be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence. |
| T-AQ-005 | The complaints log will be made available to the local authority on request. |
| T-AQ-006 | Any exceptional incidents that cause dust and/or air emissions, either on- or off-site will be recorded, and then the action taken to resolve the situation recorded in the site log book. |
| T-AQ-007 | Daily on-site and off-site inspections (up to a minimum of 50m from the site boundary) will be undertaken by a suitably experienced person, where receptors (including roads) are nearby (within 100m of Site or access roads) to monitor dust.<br>The inspection results will be recorded and made available to the local authority when asked. This will include regular dust soiling checks of surfaces such as street furniture, cars, and windowsills within 100m of construction works. |
| T-AQ-008 | The frequency of Site inspections will be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. |
| T-AQ-012 | Runoff of water and/or mud will be mitigated against while the Site is being set up and maintained. |
| T-AQ-014 | Ensure all vehicle operators switch off engines when not in use and ensure there is no idling. |
| T-AQ-015 | Where reasonably practicable reduce the use of diesel- or petrol-powered generators, for example by using hybrid site generators. |
| T-AQ-016 | A maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas will be imposed. |
| T-AQ-019 | Covered skips will be used to reduce the risk of materials or dusty materials blowing out and contaminating the surrounding site. |
| T-AQ-020 | 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. |
| T-AQ-022 | For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust. |
| T-AQ-023 | All construction plant and equipment will be maintained and in good working order. |
| T-AQ-026 | Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. |
| T-AQ-033 | Bag and remove any biological debris or damp down such material before decommissioning. |
| T-AQ-035 | There will be no bonfires or burning of waste materials. |
| T-LV-001 | Construction Compound sites will be located to avoid being in close proximity to residential properties to minimise the number of receptors that could be affected. |
| T-LV-002 | Horizonal Directional Drilling (HDD) will be used under the sand dunes; minimising visibility and avoiding key landscape features. |
| T-LV-003 | Land disturbed to make way for Construction Compounds that is not then utilised as part of the TCPA Proposed Development during operation will be reinstated and returned to existing land uses following completion of the construction stage. |
| T-LV-006 | Arable land not required in operation will be cultivated and returned to agricultural use upon completion of construction. |

| Ref | Mitigation and monitoring commitment |
|---|---|
| | Fenced boundaries will be reinstated and gaps in hedgerows will be replanted. Grassland will be cultivated and reinstated.<br>Protective fencing to areas of grassland reinstatement would typically remain in place for up to 12 months to exclude livestock and allow re-seeded grass to establish. It is considered that the majority of agricultural landscape will return to its previous use and form within a year of construction, if not earlier. |
| T-LV-011 | Sections of other boundary features removed during construction, such as fences, will be replaced to match the original and/or adjacent boundary features. Boundary Marker posts for the new Foreshore Cables will be located at some boundaries to aid aerial surveillance and ground-based monitoring, and also to alert people to the presence of the TCPA Proposed Development to reduce any risk of damage to it. The location and design of these markers will be selected to minimise intrusion on the landscape. |
| T-LV-015 | Any working areas, including Construction Compound (s) will be kept tidy through robust Construction Compound Management. |
| T-LV-016 | A Dust Management Plan has been produced outlining measures to control dust, including timing works outside of prolonged dry weather and using dust suppression techniques. |
| T-LV-017 | Habitats that are being retained during construction of the TCPA Proposed development should be protected using physical barriers, such as Heras fencing, to demarcate these areas and avoid the risk of encroachment and accidental damage. |
| T-LV-019 | The construction programme will be kept to the minimum practicable time to reduce the duration of any ecological and/or landscape impacts. The TCPA Proposed Development will be delivered on a phased basis. Areas will be cleared for construction as close as possible to works commencing and top soiling, reseeding and planting will be undertaken during the next available season after sections of work are complete; |
| T-LV-021 | Wherever possible, access points to the Red Line Boundary area will seek to minimise impacts on hedges and trees |
| T-LV-022 | Retention and protection of trees covered by Tree Preservation Orders (unless agreed otherwise with the Local Planning Authority). |
| T-MD-001 | The construction stage(s) of the TCPA Proposed Development will be managed through the implementation of the Construction Phase Plan (required under the CDM Regulations 2015). |
| T-MD-002 | The design, installation, commissioning, operation and maintenance of plant, drainage systems, equipment, and machinery, including associated systems, will consider Good Engineering Practice. |
| T-MD-003 | The Applicant will undertake a programme of hazard studies. |
| T-MD-004 | The TCPA Proposed Development will be managed in accordance with Environmental, Health & Safety Management systems. |
| T-MD-005 | All construction risks will be managed in accordance with the CDM Health & Safety Plan and Construction Phase Plan. |
| T-MD-006 | The Proposed Development will be managed in accordance with supplier management environmental, health & safety standards (for example, Construction Skills Certification Scheme). |
| T-MD-007 | The Proposed Development will be managed in accordance with supplier management environmental, health & safety standards (for example, Construction Skills Certification Scheme). |
| T-MD-009 | The Applicant and Construction Contractor will implement a Construction and Environmental Management systems (including the CEMP). |
| T-MW-001 | The Construction Contractor will ensure that the application of circular economy principles will be followed, as implemented in the detailed CEMP, including:<br>• Design solutions to prevent the production of waste where feasible, and to send the waste produced for recovery where possible;<br>• Considering all phases of construction, operation and decommissioning in a lifecycle approach; and<br>• Identification of resource streams that might be considered by-products (i.e. not wastes, as per applicable legislation) and reused or recycled. |
| T-MW-002 | The Waste Management Plan, which will be produced by the Construction Contractor(s), will adhere to all relevant legislation and the Applicant's waste management procedures including technical guidance note (AMTE TG 010) as detailed in the Applicant's policy. |
| T-MW-003 | Waste storage areas will be incorporated into the design with waste segregation measures put in place by the Construction Contractor. |
| T-MW-004 | Identification and specification of material resources that can be acquired responsibly, in accordance with BES 6001 Responsible Sourcing of Construction Products |
| T-MW-005 | The Construction Contractor will implement, and follow guidance within, the Materials Management Plan (MMP) in accordance with the CL:AIRE Definition of Waste: Code of Practice. |

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-MW-006 | Engage early with Construction Contractors to identify possible enhancement and mitigation measures to identify opportunities to further reduce any waste through collaboration and regional synergies. |
| T-PH-002 | Where possible, a standard working-day of 10 hours per day and 5 days per working week and 5 hours on Saturdays is will be implemented for the construction of the TCPA Proposed Development |
| T-PH-003 | A Construction Traffic Management Plan will be prepared and will provide details of procedures for construction related traffic. |
| T-PH-004 | The public will be informed of the nature, timing and duration of particular construction activities and the duration of the construction works by newsletters and liaison with the construction contractor. |
| T-PH-005 | Construction Compounds will be set out and managed so as to reduce impacts on access to / from private property and housing, and community facilities as far as practicable. |
| T-PH-006 | Clear signage and directions for any alternative routes and appropriate alternative diversions will be provided and diversions clearly publicised to maintain access. Signage to advertise that businesses are open and operating as normal will also be provided where required. |
| T-PH-007 | Community Facilities will be consulted prior to construction where access arrangements will be directly affected. Traffic management systems and diversion routes will be put in place to maintain access to identified community facilities. |
| T-PH-008 | Vehicular access will be maintained at all times to community facilities which perform emergency service activities. |
| T-PH-009 | A Dust Management Plan has been prepared to set out mitigation measures for dust and PM10. This is provided within the OCEMP (Document Reference: T.5.1). |
| T-PH-010 | Construction activities that take place adjacent to Point of Ayr Holiday Park and Haven Presthaven Holiday Park, where practicable will be outside of the peak holiday seasons (e.g. peak summer season (July – August) as well as half terms and Easter holidays. |

### 6.4 Construction Traffic Management Plan (CTMP)

Transport management measures relevant to the Proposed Development are included within the Construction Traffic Management Plan, and Construction Workers Travel Plan submitted in respect of the conditions with the extant planning permission (**FUL/000246/23**). Additionally, the transport management measures relevant to the Proposed Development are presented within the following sections.

Best practice measures include:

- Follow BS 5489-1:2020 and BS 8442:2022 for temporary and permanent traffic controls.
- Promotion, management and control of such general provisions and measures for traffic management and control to be implemented by all contractors and sub-contractors throughout the extent and duration of the construction.
- On-site provision for site access roads and pedestrian footways, with controlled access from the public domain for pedestrians and vehicles, on-site parking provisions, standing, lay-down and unloading facilities for delivery vehicles, and on-site compound, welfare facilities and material holding areas for use by all contractors and sub-contractors.
- Ensuring that the on-site provisions are controlled, managed and shall be safe at all times through the provision of planned and informed procedures and segregation between vehicular and pedestrian traffic.

#### 6.4.1 Site Access

Site access for the proposed works will be via the following locations:

- HDD Entry Pit Establishment –via Warren Farm entry.
- HHD Exit Pit Establishment – via beach entry near Talacre car park incl. movements between Entry site and Exit Site via agricultural tractor and trailer. Unloading of equipment at Talacre car park, and unloading at the bottom of the ramp of the seawall prior driving to the car park/beach.

- Pipe welding – site compound at/near Talacre car park.HDD exit pit establishment
- Site Establishment – establishment for cable installation works similar to Entry and Exit Pit.
- Drilling Fluid Break-out – access to dune area for clean-up required in contingency situation.

A maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas will be imposed. Crew/personnel/visitors are using same site access on daily basis. Car sharing to limit vehicles on site is promoted.

Truck movements will be undertaken during early mornings when the area is quieter, and to be minimised at peak times during the days of the holiday season. Clear signage and directions for any alternative routes and appropriate alternative diversions will be provided and diversions clearly publicised to maintain access. Signage to advertise that businesses are open and operating as normal will also be provided where required. It should be noted that no diversions of public roads are planned at this stage.

Temporary mats may be laid down where necessary, across the beach between Talacre car park and HDD exit site, and from Warren Farm to the Valve Field. This will be implemented to facilitate access across areas of soft sand, but it will also minimise damage of the existing habitats along the route.

Access for pedestrians is expected only to be affected at Talacre car park, beach entry and at the beach itself. The aim is to have both the car park and beach entry accessible throughout the operations for pedestrians and emergency vehicles, however temporary diversions may be required to keep them clear of work sites.

At the beach, site compounds and work areas are temporarily fenced off for the public. However during the pipe pull-back, and cable installation preparations, installation and burial works the work area cannot be practically fenced off due to the area being intertidal. Appropriate measures will be taken for pedestrians to walk by safely. Temporary diversions on the beach for pedestrian use will be arranged as required, either between the HDD exit pit and the dunes or across the dunes in the case that the beach must be fully closed, full closure of the beach will be reduced to the minimum. It should be noted that barriers cannot be placed on the beach intertidal areas, as these may get loose due to the tide and become a pollutant and a hazard for shipping activities. Workers will look out at the public for them to pass the work site safely or works are stopped if they are too close in the vicinity.

### 6.4.2 Expected Traffic Volume

The expected traffic volume is difficult to estimate at this stage as it depends on the choices made during the detailed engineering phase. Instead an indication of expected traffic volume during the various stages of the project is shown to give an indication. As explained in the programmes of the activities (4.5.10 and 4.6.5) the works are indicatively scheduled for the following months:

- HDD activities: February to April 2026
    - HDD entry and Talacre car park welding 08-02-2026 until 05-04-2026.
    - HDD exit 01-03-2026 until 01-04-2026.

- Cable activities: June to August 2026
    - Cable works onshore 13-06-2026 until 31-08-2026.

- Cable works beach 22-07-2026 until 31-08-2026.

The amount of traffic volume will vary during the project phases. When setting up and demobilising sites, the majority of truck movement are required. Throughout the project consumable runs are required to e.g. transport food, water, bentonite, fuel, equipment consumables to site and also to be able to dispose cuttings, waste and wastewater. Below overview gives an indication for this truck movements. The daily numbers are estimates and could be more one day and none the next day. A separation is made between truck movements towards Warren Farm and truck movements towards Talacre park and the beach area, as truck movements via Warren Farm are expected not to limit the area too much. Also please note that equipment may be offloaded first at the Warren Farm and thereafter transported by tractor/trailer towards the beach, which implies two truck movements in table below.

As mentioned, the values are conservative as detailed engineering is yet to be completed. More accurate volumes will be defined in detailed engineering and presented within the TMP by Contractor at a later stage.

The following considerations can be and have been taken to limit the impact:

- Where practicable, deliveries are made on weekdays (Monday to Friday).
- It has been checked that there is no school between the site compounds and the main road (A548). i.e., no movements need to be planned outside school hours.
- Consideration can be given, where possible, to reduce the truck movements during peak times/afternoon, and increase these in the morning and evenings.
- Truck drivers will receive delivery instructions (which will be part of the more detailed TMP) to keep them on the right roads as planned and agreed upon. Do and don’ts can be included within this instruction.

Besides truck movements, personnel movements will be done by car, vans, and/or 4x4s to access the beach. No busses transporting personnel to/from and between sites are planned for personnel transfer. Dedicated car parking will be made available on the valve field, beach location and/or at Talacre car parking. Personnel movements are not detailed in Table below but will be on a daily basis at time of execution.

**Table 6.7 Indicative overview truck movements for indication traffic volume peaks (*= no truck movements planned)**

| Month of 2026 | Week | Main Activity (no delays considered) | Trucks via Warren Farm | Trucks via Talacre car park / beach (incl. collection at Warren Farm) |
|---|---|---|---|---|
| February | Wk. 6 (Sun 8 Feb) | Mobilisation Warren Farm road + HDD entry | Up to 5 daily | -* |
| | Wk. 7 (Mo 9 Feb) | Mobilisation Warren Farm road + HDD entry temp. welfare facilities | Up to 8 daily | Up to 2 daily |
| | Wk. 8 (Mo 16 Feb) | Mobilisation HDD entry: top soil stripping, rock installation, fencing and hoarding<br>Mobilisation HDD exit at beach | Up to 8 daily | Up to 6 daily |
| | Wk. 9 (Mo 23 Feb) | Mobilisation HDD entry: welfare<br>Mobilisation HDD exit at beach | Up to 6 daily | Up to 6 daily |
| March | Wk. 10 (Mo 2 Mar) | Mobilisation HDD entry: HDD equipment<br>Mobilisation HDD exit at beach: pipewelding | Up to 3 daily | Up to 6 daily |
| | Wk. 11 (Mo 9 Mar) | Mobilisation HDD entry: HDD equipment<br>Mobilisation HDD exit at beach: pipewelding<br>HDD drilling mud return line | Up to 3 daily | Up to 4 daily |
| | Wk. 12 (Mo 16 Mar) | HDD drilling | Up to 3 daily | Up to 4 daily |
| | Wk. 13 (Mo 23 Mar) | HDD drilling finalisation, extract mud return line<br>Start demobilisation | Up to 5 daily | Up to 6 daily |

| Month of 2026 | Week | Main Activity (no delays considered) | Trucks via Warren Farm | Trucks via Talacre car park / beach (incl. collection at Warren Farm) |
|---|---|---|---|---|
| April | Wk. 14 (Mo 30 Mar) | Demobilisation Beach and Warren Farm | Up to 5 daily | Up to 6 daily |
| | Wk. 15 (Mo 6 Apr) | Demobilisation Beach and Warren Farm | Up to 5 daily | Up to 4 daily |
| | Wk. 16 (Mo 13 Apr) | -* | -* | -* |
| | Wk. 17 (Mo 20 Apr) | -* | -* | -* |
| | Wk. 18 (Mo 27 Apr) | -* | -* | -* |
| May | Wk. 19 (Mo 4 May) | -* | -* | -* |
| | Wk. 20 (Mo 11 May) | -* | -* | -* |
| | Wk. 21 (Mo 18 May) | -* | -* | -* |
| | Wk. 22 (Mo 25 May) | -* | -* | -* |
| June | Wk. 23 (Mo 1 Jun) | Mobilisation Warren Farm | Up to 8 daily | -* |
| | Wk. 24 (Mo 8 Jun) | Mobilisation Warren Farm / Beach | Up to 4 daily | Up to 8 daily |
| | Wk. 25 (Mo 15 Jun) | Mobilisation Beach | Up to 2 daily | Up to 8 daily |
| | Wk. 26 (Mo 22 Jun) | Mobilisation Beach | Up to 2 daily | Up to 6 daily |
| July | Wk. 27 (Mo 29 Jun) | Beach prep. / standby for CLV arrival / cable pull-in with CLV | Up to 2 daily | Up to 4 daily |
| | Wk. 28 (Mo 6 Jul) | Post cable pull-in works / cable burial works | Up to 2 daily | Up to 4 daily |
| | Wk. 29 (Mo 13 Jul) | Cable burial works / partial demob beach | Up to 4 daily | Up to 4 daily |
| | Wk. 30 (Mo 20 Jul) | Demob Beach and Warren Farm | Up to 6 daily | Up to 8 daily |
| | Wk. 31 (Mo 27 Jul) | Demob Beach and Warren Farm | Up to 4 daily | Up to 8 daily |
| August | Wk. 32 (Mo 3 Aug) | Demob Warren Farm (if required) | Up to 2 daily | -* |
| | Wk. 33 (Mo 10 Aug) | -* | -* | -* |

**Table 6.8** presents the traffic and transport related mitigation and monitoring commitments from the REAC in Planning Permission **FUL/000246/23** that will be implemented during the execution of the Proposed Development.

**Table 6.8 Traffic, and Transport mitigation and monitoring commitments**

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-TT-001 | Careful consideration will be taken of the siting of temporary access points during construction. Access points will require the incorporation of site-specific and appropriate visibility splays, turning radii and, where deemed necessary or appropriate, speed limit reductions. |
| T-TT-002 | The Construction Contractor will follow the mitigation measures in the Construction Traffic Management Plan (CTMP) during construction works. |
| T-TT-003 | Sensitive selection and specification of construction access points off the public highway. Construction traffic routes have been selected to reduce, where possible, traffic effects on links that would be more sensitive to changes in traffic volumes, due to the presence of built environment indicators used by sensitive affected parties. |
| T-TT-004 | Details of temporary diversions for footpaths are provided within the Outline CTMP included within the OCEMP (Document Reference: T.5.1), of which the Construction Contractor will implement on site. |
| T-TT-005 | Community Engagement and Public Information. Information regarding construction traffic activities and movements would be provided to the public. The means of communication would include online updates, letter drops, information boards and details of key contacts. |
| T-TT-006 | CTMP measures to include other standard forms of mitigation including for example temporary traffic management, hazard signage, timing restrictions – details and requirement for these measures to be agreed with the LPA.<br>Specific measures to include:<br>• the introduction of temporary speed restrictions;<br>• controls on timings to minimise HGV deliveries at peak times; and<br>• the use of traffic marshals to manage HGV movements with local traffic and pedestrians/cyclists to minimise exposure for these groups to construction traffic;<br>• the details and requirement for these measures to be agreed with Flintshire County Council by the contractor in development of the full CTMP. |

### 6.5 Soil and Land

The following best practice construction methods have the potential to reduce adverse impacts and have been included:

- Backfilling of earthworks and use of trenchless crossing technologies to reduce loss of site won material.
- Materials excavated for the Entry and Exit pits work will be stockpiled adjacent to the works and reused during backfilling of the trenches. Any topsoil or organic surface material will be stockpiled separately for re-use on completion of the works and revegetated as necessary.
- Temporary installation or upgrade of existing access tracks for the works will be set up to minimise disruption and local environmental impacts to Land and Soil. Options will include provision of bog matts (where wet soil conditions are anticipated) and compacted gravel tracks (where road-going vehicles or heavy traffic is anticipated).

#### 6.5.1 Arable Land

Passage through Warren Farm is planned to be done by placing matting across the field. However, if required, topsoil can be stripped, but this is currently not planned by the Contractor. This layer is then stockpiled and will be reinstated and returned to existing land at completion of the construction phase.

**Table 6.9** presents the land and soil related mitigation and monitoring commitments from the REAC in Planning Permission **FUL/000246/23** that will be implemented during the execution of the Proposed Development.

**Table 6.9 Land and soil mitigation and monitoring commitments**

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-LS-002 | Any facilities for the storage of oils, fuels or chemicals will be sited on impervious bases and surrounded by impervious bund walls. The volume of the bunded compound should be 110% of the capacity of the tank, all filling points, gauges, vents and sight glasses will be located within the bund. Associated pipework should be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets will be detailed to discharge downwards into the bund and refuelling will be supervised at all times, preferably on an impermeable surface. This system will reduce the potential for the addition of new contaminants to the existing baseline environment (e.g., spill or leak) |
| T-LS-003 | Any waste materials generated as a result of the TCPA Proposed Development will be disposed of satisfactorily by registered waste carriers and in accordance with Section 34 of the Environmental Protection Act 1990 and NRW relevant guidance on waste management. Uncontrolled disposal or discharge of waste is strictly forbidden, and compliance of all activities related to the management of waste with all existing local laws and regulations shall be assessed and assured by the subsidiary |
| T-LS-004 | Acute exposure to potential contamination will be mitigated through normal working practice using appropriate Risk Assessment Method Statement and use of standard PPE and hygiene best practice. Where contamination is suspected, construction workers will be provided with appropriate Personal Protective Equipment (PPE) or Respiratory Protective Equipment (RPE) (over and above the standard PPE) to prevent direct contact, ingestion or inhalation of potential soil or groundwater contamination. |
| T-LS-005 | Earthworks will be completed in accordance with a Contaminated Land: Applications in Real Environments (CL:AIRE) compliant Materials Management Plan (MMP) to ensure re-used material does not present a risk to human health or the environment and complies with UK waste legislation regulations. An earthworks specification will be produced that will include protocols for testing and limiting values to ensure that imported materials are suitable for their intended use in terms of their chemical quality; |
| T-LS-008 | Appropriate measures to limit contamination to the ground from construction related plant/machinery and storage of materials will be incorporated within the detailed CEMP |
| T-LS-009 | The handling and temporary storage of soils will be in accordance with DEFRA (2009) Construction code of Practise (Ref. 11.31) and the IoQ (2021) Soil Handling Guide (Ref. 11.32). |
| T-LS-018 | Backfilling of earthworks and use of trenchless crossing technologies to reduce loss of Site won material. |

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-LS-020 | Combination of cable trenching and horizontal directional drilling (HDD) to reduce loss of BMV agricultural land, avoid damage to environmentally sensitive land uses and controlled waters, and prevent exposure pathways to human health within the dunes area of the Foreshore of this ES. |
| T-LS-022 | A dewatering management plan should be produced by the Construction Contractor (see Appendix 11.5, Volume III), to assess the potential risks arising from dewatering, in regard to local private water supplies and ecosystems |
| T-LS-025 | If, during the trenched ploughing, unexpected contamination is encountered, the open trench will be lined in order to inhibit water percolation and subsequent leachate generation |
| T-LS-026 | The Construction Contractor will appoint an appropriately qualified person (e.g., Environmental Clerk of Works (EnvCoW)) to maintain a Watching Brief for the duration of any ground excavations. The aim and scope of the Watching Brief will be to identify any unexpected contamination and advise on the correct course of action if discovered.<br>Should unexpected Made Ground or unexpected contaminated ground (i.e., visual or olfactory evidence of contamination) be encountered during the construction phase the ECoW or equivalent qualified person will be notified.<br>Testing of Made Ground for a minimum of asbestos, metals, petroleum hydrocarbons and polyaromatic hydrocarbons to assess suitability for re-use and potential risks to construction works should be undertaken. |
| T-LS-029 | An Unexploded Ordnance (UXO) assessment will be undertaken and will be used during the production of all risk assessments and method statements. |

### 6.6 Resource Use and Management

The Principal Contractor will follow a waste hierarchy approach: eliminate, reduce, reuse, recycle, and dispose.

#### 6.6.1 Fuel Storage and Refuelling

To reduce spills and leaks, fuel storage and refuelling will be managed as follows on site:

- Materials should never be stored on bare ground, always impermeable surfaces to be used.
- Materials should never be stored anywhere near to watercourses, soakaways or other sensitive areas.
- Plant nappies of suitable size must be always placed under static plant & equipment. Drip trays will be used in the event that plant nappies are not available.
- Regularly check the plant, equipment & vehicles for leaks. Arrange for leaking plant to be taken out of service and maintained.
- Use secondary containment systems with a 110% capacity.
- Keep spill kits available near fuel storage areas. If spill kits are utilized to contain a spill on site, the products will be replenished for future use.
- Refuel in designated areas away from water bodies.
- Supervise all fuel transfers and ensure appropriate protective measures are in place.
- Where possible, refuelling should only be carried out in a designated area, which will be secured/locked out of hours.
- The refuelling area shall be located away from drains and watercourses (>10m from a watercourse and >50 meters from a spring, well or borehole).
- Areas of permanent waste oil/fuel/chemical storage will be located 50m away from watercourses or drainage paths. Where this is not possible, advice will be sought from the Field Environmental Manager, and a minimum distance will be agreed with the Client.
- Refuelling will always be supervised by a competent supervisor.

- Mobile plant must be refuelled away from surface waters, drains, permeable pavements and open excavations. A fuel drip tray must be used.

### 6.6.2 Use and Storage of Hazardous Materials/Substances

Any contaminated topsoil (if encountered) will be managed according to national and local regulations. The use and storage of solvents, cements, adhesives, grout and concrete shall be managed as follows during the HDD and the lay of the cable activities :

- The Contractor is responsible for carrying out a risk assessment of each substance and ensuring that all appropriate storage, protective equipment and if necessary, emergency procedures are put in place on site.
- All hazardous materials shall be labelled, sealed and stored with their Control of Substances Hazardous to Health (COSHH) assessment in a bunded and lockable container away from drains and watercourses when not in use.
- COSHH datasheet will be read and understood before using any hazardous materials.
- Any spent (contaminated) spill kits, absorbent granules, sheets or fibres must be disposed of in accordance with COSHH regulations requirements.
- Hazardous liquids shall be transferred using a funnel and drip tray and sealed and returned to the container immediately after use. Damaged containers shall be reported to the Field Environmental Manager.
- All usages shall comply with its requirements.
- Hazardous liquids must be re-sealed after use. Empty containers are to be disposed of to the designated container within the waste compound.
- Construction workers are required to wear Personal Protective Equipment (PPE) such as gloves and face masks (where appropriate) to prevent dermal contact and inhalation or ingestion.

**Table 6.10** presents the resource use and management related mitigation and monitoring commitments from the REAC in Planning Permission **FUL/000246/23** that will be implemented during the execution of the Proposed Development.

**Table 6.10 Resource use and management mitigation and monitoring commitments**

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-GG-001 | The Detailed Design of the TCPA Proposed Development will ensure the design is optimised to avoid unnecessary permanent design aspects, and minimising material consumption and waste generation, as far as reasonably practicable |
| T-GG-002 | The Detailed Design of the TCPA Proposed Development will aim to substitute-in and use alternative raw materials and resources , where practicable. |
| T-GG-003 | The Detailed Design of the TCPA Proposed Development will aim to reduce the elements required and maximise the re- use of existing equipment where possible. |
| T-GG-004 | Maximising the opportunity to use more sustainable materials and products with reduced embodied carbon emissions and materials/resources featuring recycled content (where safe and of sufficient integrity for engineering), eventually supported with eco- and carbon labels or verified Environmental Product Declarations (EPD), are preferred. |
| T-GG-005 | Construction materials will be sourced from local suppliers and local waste disposal facilities will be used where available and practicable to minimise the distance materials are transported from source to Site and from Site to disposal. |
| T-GG-006 | Avoid disposal of construction waste to landfill, maximising recycling, and reuse of waste where possible. |

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-GG-007 | Using modern and efficient low emission construction plant and delivery vehicles, and/or those powered by electricity from alternative/lower carbon fuels, as far as practicable. Construction Contractors will ensure high performance of plant and equipment through correct and efficient operation, maintenance, and servicing of vehicle fleet to avoid polluting emissions. |
| T-GG-008 | Training policies will be in place during site induction to avoid idling of engines, spills of fuels (for example, when refuelling) and safe/environmentally sensitive driving techniques to maximise fuel saving. |
| T-GG-009 | The sustainability credentials of suppliers and companies in the supply chain will be considered as part of the procurement process. |
| T-GG-010 | To reduce the level of energy consumption used during construction, innovative construction methods will be utilised where practicable. These may include:<br>• avoiding sharp acceleration and braking to conserve fuel;<br>• adjusting haul and access road/points to smoother gradients to avoid unnecessary fuel usage; and<br>• only using plant when required (including future planning as to what plant is required, and when). |
| T-WR-016 | Waste fuels and other fluid contaminants will be collected in leak-proof containers prior to removal from the construction area to an approved recycling processing facility. |
| T-WR-017 | Oil absorbent booms will be made available at construction compounds and works areas and will be deployed as soon as possible in the event of a significant spillage. |
| T-WR-019 | Measures implemented to control spillage or pollution risks for site runoff or works within watercourses will be regularly inspected to ensure they are working effectively. |
| T-WR-022 | Surface water run-off and excavation dewatering will be captured and settled out prior to disposal where practicable. The Construction Contractor will ensure that any contaminants are to be suitably removed prior to disposal. |
| T-WR-024 | Silt fences, silt traps, filter bunds, settlement basins and/or proprietary units' will be used to treat sediment laden water generated on-site before discharge. |
| T-WR-025 | Sewage generated from site welfare facilities will be disposed of appropriately. This may be by discharge to the foul sewer network or by collection in septic tank for disposal off-site. |
| T-WR-026 | Works will be undertaken in compliance with the relevant sections of BS6031:2009 Code of Practice for Earthworks (British Standards, 2009) with respect to protection of water quality and control of Site drainage including washings, dewatering, abstractions, and surface water. |

## 6.7 Waste Management Plan

### 6.7.1 General principles

The Proposed Development shall comply with the Waste Duty of Care Code of Practice. The Principal Contractor shall seek to promote the re-use of excavated materials through optimisation of cut and fill operations to improve the sustainable and cost-effective development of land, as per the Definition of Waste: Development Industry Code of Practice (DoWCoP). In many instances the DoWCoP can provide an alternative to Environmental Permits or Waste Exemptions when seeking to reuse excavated materials.

The control measures that will be applied to waste management during the Proposed Development include:

- Set up waste collection areas with segregated containers for different waste types.
- Use licensed waste carriers and keep duty of care documentation on-site.
- Implement a Site Waste Management Plan and audit waste transfer records.
- Divert waste from landfills by recycling or reusing materials such as timber, metal, and concrete.
- Regularly update recycling progress and report any waste incidents.

- All waste incidents shall be reported immediately to the Construction Manager and Field Environmental Manager.
- Spoil and recycled aggregate transfers shall be carried out in accordance with an approved Materials Management Plan and all transfer tickets must be retained on site.

The waste management foreseen for the Proposed Development will arise from the use, generation, and handling of the following:

- Drilling Fluids.
- Cuttings.
- Unplanned bentonite discharge into sea.
- Unplanned bentonite break out.
- Water abstraction for water supply on site.
- Potential Dewatering discharge permit.
- Other waste such as:
    - Toilet water;
    - Dirty water;
    - Canteen waste;
    - Wood/steel/concrete waste;
    - Packaging / plastic;
    - Oil and waste fuel; and
    - Other.

### 6.7.2 Drilling fluid management

At Warren Farm / HDD Entry site, the used drilling fluids are collected and deposited in a mud lagoon for cleaning prior to re-use. The drilling fluid lagoon will be lined and located within a fenced area that will prevent fluid from migrating offsite during the works. The HDD contractor will continuously monitor the level of drilling fluid within the lagoon, especially during periods of heavy rainfall, to prevent over-filling and fluid loss. Used drilling mud will be transferred from the storage lagoon to the recycling system by way of an electrical submersible slurry pump. The multi screened cleaning system separates cuttings from the used fluid using a combination of mesh screens and a series of hydro-cyclones to remove coarse and fine particles from the used fluid. Reducing the solids sufficiently allows the used drill fluid to be returned to the mixer and static holding tanks and then re-used downhole. The separated solids removed from the drill fluid are collected and stockpiled for removal from site on completion.

**Figure 6.5: Drill Fluid Recycling Plant (typical)**

To prevent discharges of drilling fluid at the Entry and Exit Pits, the HDD contractor will continuously record down-hole annular pressure and fluid discharge rates during both pilot drilling and reaming. Discrepancies between pumped and returned volumes indicate losses into aquifer or hydrofractures. The contractor will also implement a closed-loop system to capture all drilling returns, with transfer pumps and retention pits, preventing seepage to the surrounding dune groundwater.

Given the sensitivity of the area and the distance involved in traveling to the entry site, conducting all transfers by road is not considered efficient. To transfer the drilling fluid back from the HDD exit pit to the HDD Entry site for recycling, a mud return line will be drilled next to the HDD drill line. The drill pipe will remain in place to serve as a transfer line between these two locations. Once the works are complete, this pipe will be removed.

Because cuttings within the fluid can potentially block the mud return line, the drilling fluid is first cleaned at the beach. A shaker system (similar, but smaller than the recycling facility at the HDD entry—see **Figure 4.24**) is proposed for installation at Warren Farm. This system separates larger cuttings from the drilling fluid, allowing the fluid to return via the mud return line, while the separated cuttings are contained at the beach before being transported by agricultural tractor or vacuum tankers back to Warren Farm, where they are stockpiled.

Upon project completion, drilling fluid—including fluid in the lagoon—will be collected by tanker. This fluid will either be reused on other projects or disposed of by an accredited waste handler. Soil that has come into contact with drilling fluid (such as at the lagoon, drill rig, HDD entry, and HDD exit pit) will be excavated and transported off site for management by a licensed waste handler.

### 6.7.3 Cuttings

Cuttings from the drilling works are stockpiled during the works and will be removed by transporting them from site on completion of the works. The cuttings will be either stored in skips or tipper lorries for transporting. Disposal of the cuttings will be made in accordance with this Waste Management Plan and legislative requirements.

### 6.7.4 Unplanned drilling fluid break-out

During the drilling process there is an inherent risk that an uncontrolled release of drilling fluids may occur, Contractor will maintain lookout for such occurrence at all stages of the drilling operations. In the event this

does occur the drilling will be stopped, and a cleanup and mitigation plan will be implemented. This may require some personnel and equipment to access the sand dunes area.

While precautions will be taken to avoid this happening, if it does, it is required to be able to clean up and drilling fluids that are lost. This would be with handheld equipment where possible, but use of a small, tracked excavator and some pumping equipment or a dumper truck can be required. Access to the dunes is done via the valve field exit towards the dunes and/or other parking space found in the area

**Appendix B** includes ***The Breakout Plan for the Liverpool Bay CCS Project (AMS Project J3130)***. The Breakout Plan sets out the procedures and responsibilities for managing drilling fluid "breakouts" during Horizontal Directional Drilling (HDD) works at Talacre, North Wales. It provides a structured approach to prevention, monitoring, containment, and clean-up to minimise environmental impact and ensure health and safety compliance.

The introduction explains the function of drilling fluids in HDD operations and highlights the risk of inadvertent returns to surface when bore pressures exceed local ground strength. The plan describes how the HDD works (a ~500 m bore with a polyethylene duct) will be executed, and the measures in place to respond to breakout events. It stresses commitment to protecting sensitive dune and beach habitats, supported by the Contractor's HSE Plan and Environmental Management Plan.

Detailed sections cover the principles of drilling fluid use, including their generally benign nature, and outline proactive monitoring by drill operators and mud technicians to reduce risks. Breakout management is described in four stages: prevention (careful fluid monitoring and bore design), monitoring (continuous inspection and patrols along the drill line), containment (using hay bales, sandbags, pumps, or vacuum tankers to manage spills), and clean-up (safe disposal, reinstatement of affected areas, GPS and photographic recording, and Ecological Clerk of Works monitoring).

The document also lays out clear reporting protocols (**STOP–CONTAIN–NOTIFY**), public and environmental safety considerations for accessing the Warren and dunes, and separate procedures for minor and major breakouts. A list of plant and equipment required for rapid deployment is included. Finally, health and safety provisions are described, including PPE standards, first aid availability, COSHH compliance, and the need for all personnel to be inducted, competent, and signed onto the risk assessment. A briefing register at the end ensures accountability and awareness of the method statement.

Overall, the breakout plan demonstrates a strong emphasis on environmental protection, health and safety compliance, and clear operational procedures to manage the unlikely event of drilling fluid escape during HDD works.

### 6.7.5 Potential need Abstraction permit for water supply on site / Hydrant licence

For the water supply of the drilling we envisage that water will be delivered by 3rd party, we will ensure that they provide the suitable extraction license for the provision of water. Therefore, this is for information only, we will make sure the supplier takes care of this.

### 6.7.6 Potential Dewatering

No dewatering or discharge is anticipated during Horizontal Directional Drilling (HDD) activities at the entry pit, exit pits, and Talacre beach locations. While the HDD Exit Pit will be in the inter-tidal environment, there are

no terrestrial surface watercourses located within 500m of the HDD works. Notwithstanding, monitoring checks and inspections will be conducted prior to and during works.

A successful HDD conduit is the careful management of drilling fluid pressure to prevent water ingress. Furthermore, once the conduit is drilled, the HDD conduit is sleeved by watertight glass reinforced plastic (GRP) pipework to prevent further water ingress and maintain the integrity of the conduit, and electrical cable. The relatively narrow diameter (around 450mm) HDD conduit, while beneath the water table, is considered unlikely to:

- create a barrier to groundwater flow;
- create a preferential flow pathway for groundwater; or
- affect groundwater levels. Groundwater is expected to flow around the conduit.

If monitoring indicates that current mitigation measures (as outlined in the WFD at Annex C), are insufficient, adaptive mitigation strategies will be implemented accordingly. Due to the nature, and location of the construction works dewatering is unlikely. However, should dewatering be required, the method and location will be agreed with NRW.

### 6.7.7 Other Waste

Waste originating from the personnel and welfare facilities on site will be disposed of as per local regulations. Waste is stowed in covered skips where possible to prevent materials being blown out by the wind. Waste water coming from the welfare facilities will be contained in tanks. Waste and wastewater is removed by trucks from registered waste carriers. Covers are used where required to limit escape of materials during transport. No burning of waste on site is considered.

Good housekeeping is held on the site to limit debris flying around and where possible machinery is switched off when not in use. This also relates to maintenance of construction plant and equipment on site to ensure good working order and to prevent spills. In case of spills, 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. Please see **Chapter 7.0 EMERGENCY PREPAREDNESS AND RESPONSE**.

Electricity on site is provided by generators, and solar panels and battery packs can also be used for certain equipment to reduce emissions. Fuel is transported to site by truck and stored in double bunded fuel tank on site. When refuelling, the appropriate measures are taken to limit potential spills.

**Table 6.11** presents the waste management, and water management related mitigation and monitoring commitments from the REAC in Planning Permission **FUL/000246/23** that will be implemented during the execution of the Proposed Development.

**Table 6.11 Waste management and water management mitigation and monitoring commitments**

| Ref | Mitigation and monitoring commitment |
|---|---|
| T-MW-001 | The Construction Contractor will ensure that the application of circular economy principles will be followed, as implemented in the detailed CEMP, including:<br>• Design solutions to prevent the production of waste where feasible, and to send the waste produced for recovery where possible; |

| Ref | Mitigation and monitoring commitment |
|---|---|
| | • Considering all phases of construction, operation and decommissioning in a lifecycle approach; and<br>• Identification of resource streams that might be considered by-products (i.e. not wastes, as per applicable legislation) and reused or recycled. |
| T-MW-002 | The Waste Management Plan, which will be produced by the Construction Contractor(s), will adhere to all relevant legislation and the Applicant's waste management procedures including technical guidance note (AMTE TG 010) as detailed in the Applicant's policy. |
| T-MW-003 | Waste storage areas will be incorporated into the design with waste segregation measures put in place by the Construction Contractor. |
| T-MW-004 | Identification and specification of material resources that can be acquired responsibly, in accordance with BES 6001 Responsible Sourcing of Construction Products |
| T-MW-005 | The Construction Contractor will implement, and follow guidance within, the Materials Management Plan (MMP) in accordance with the CL:AIRE Definition of Waste: Code of Practice. |
| T-MW-006 | Engage early with Construction Contractors to identify possible enhancement and mitigation measures to identify opportunities to further reduce any waste through collaboration and regional synergies. |
| T-WR-001 | When laying the Foreshore Cables, HDD trenchless method will be used to cross the Talacre Brook and the Gronant Dune and Talacre Warren SSSI. The PoA Ditch 1 will be crossed using a trench and during this the hydrological regime will be maintained through temporary diversion or pumping and there will be careful control of sediment and pollutants. The bed and banks will be reinstated, and similar vegetation will be replanted. |
| T-WR-004 | Construction works will avoid the positioning of temporary material stockpiles near to watercourses and will ensure material stockpiles are located outside of the flood zone where practicable. |
| T-WR-011 | Areas with a greater risk of spillage (for example, vehicle maintenance and storage areas for hazardous materials) will be carefully sited (for example, away from drains or areas where surface waters may pond) and on an impermeable surface. |
| T-WR-012 | Emergency response plans will be developed, and spill kits made available on-site. |
| T-WR-013 | Measures to be put in place to prevent pollution from construction plant including:<br>• activities involving vehicles and machinery including refuelling and lubricating are to be carried out in designated areas, on an impermeable surface, with appropriate cut-off drainage located away from watercourses;<br>• plant to be maintained in a good condition with wheel washing in place (avoiding vehicle cleaning near to existing watercourses), - all refuelling would be supervised and carried out in a designated area. In the event of plant breakdown, drip trays would be used during any emergency maintenance and spill kits would be available on-site. Guidance for Pollution Prevention would be used to inform the CEMP. |
| T-WR-014 | Fuels and potentially hazardous construction materials would be stored in bunds that have areas with external cut-off drainage; fuel would be stored in double skinned tanks with 110% capacity. |
| T-WR-015 | Construction plant will be checked regularly for oil and fuel leaks, particularly when construction works are undertaken in or near the existing waterbodies. |
| T-WR-016 | Waste fuels and other fluid contaminants will be collected in leak-proof containers prior to removal from the construction area to an approved recycling processing facility. |
| T-WR-017 | Oil absorbent booms will be made available at construction compounds and works areas and will be deployed as soon as possible in the event of a significant spillage. |
| T-WR-019 | Measures implemented to control spillage or pollution risks for site runoff or works within watercourses will be regularly inspected to ensure they are working effectively. |
| T-WR-022 | Surface water run-off and excavation dewatering will be captured and settled out prior to disposal where practicable. The Construction Contractor will ensure that any contaminants are to be suitably removed prior to disposal. |
| T-WR-024 | Silt fences, silt traps, filter bunds, settlement basins and/or proprietary units' will be used to treat sediment laden water generated on-site before discharge. |
| T-WR-025 | Sewage generated from site welfare facilities will be disposed of appropriately. This may be by discharge to the foul sewer network or by collection in septic tank for disposal off-site. |
| T-WR-026 | Works will be undertaken in compliance with the relevant sections of BS6031:2009 Code of Practice for Earthworks (British Standards, 2009) with respect to protection of water quality and control of Site drainage including washings, dewatering, abstractions, and surface water. |

## 7.0 EMERGENCY PREPAREDNESS AND RESPONSE

### 7.1 Emergency Preparedness

#### 7.1.1 Spill kits

Spill kits for hydrocarbon and chemical spills will be available at all worksites, with clear signage for easy identification. The site team shall ensure:

- Additional spill kits are located at construction compounds, fuel storage points, and COSHH stores.
- Each kit will include:
    - Absorbent pads.
    - Absorbent booms.
    - Absorbent granules.
    - Hazardous waste disposal sacks.
- Regular checks will ensure spill kits are fully stocked and ready for use.
- Spill drills will be conducted periodically to ensure the workforce can effectively handle spills.
- All drills will be documented, with records kept throughout the project.

#### 7.1.2 Fire prevention

Means to raise the alarm in the event of a fire shall be available at the points of work. An assembly point shall be designated a safe distance from the active works locations and will be communicated to all members of the workforce before works commence. The workforce shall assemble at the point for a rollcall and to receive further instructions. All individuals at the worksite, including visitors, will be obliged to immediately sign in on arrival.

#### 7.1.3 Extreme weather

The Principal Contractor's Site Manager shall register to receive Met Office weather warnings. All warnings issued by the Met Office with the potential to impact upon the works shall be communicated by the Construction Manager to the workforce in a timely manner so that measures can be implemented where necessary. In the absence of the Construction Manager the Field Environmental Manager or equivalent person shall also receive and act upon all alerts.

It should be noted that the PoA site operator is registered with the Natural Resource Wales (NRW) Flood Warning system and has implemented an Emergency Response plan that includes protocols for flood risk and emergency situations. This plan enables rapid response to events such as an unlikely breach of tidal flood defences. Incident Reporting and Investigation

#### 7.1.4 Reporting

All incidents, including near misses, shall be classified according to the categories outlined in **Table 7.1**. All categories of environmental incident shall be reported by the Principal Contractor to the client as outlined below.

**Table 7.1 Reporting**

| Incident Classification | Definition |
|---|---|
| Near Miss | An event, controlled through implementation of an effective incident control measure (e.g. drip tray used, effective use of noise barrier). |
| Minor Environmental Incident | Incidents that have caused minor harm or damage to the environment e.g.<br>• A minor fuel spill below 10 litres onto ground which is immediately cleared.<br>• A minor spill of a chemical not classified as presenting an ecotoxic risk.<br>• Exceeding noise levels.<br>• Silt runoff from site which does not enter into a surface water feature; or<br>• Excess dust emissions. |
| Major Environmental Incident | Incident that has caused or may cause significant harm or damage to the environment e.g.<br>• A minor fuel spill which impacts a sensitive land feature, a water, or drains.<br>• A major fuel spillage or 10 litres.<br>• Any spillage of a chemical which is classified as presenting an ecotoxic risk.<br>• Silt runoff from site which enters a water feature.<br>• Receipt of a nuisance complaint. |

Minor incidents and near misses must be reported to the Company within 24 hours. Major incidents must be reported to the Project Manager as soon as reasonably practicable.

The contractor, after informing Company, shall report all environmental incidents that are required to be reported to National Resources Wales and/or to any other relevant statutory or regulatory bodies. Emergency contact details are outlined in **Section 7.1.6** for all contacts relevant to the works.

### 7.1.5 Investigation

Reporting of an incident to the Project Manager shall, where necessary, commence the incident investigation which shall be jointly conducted between Company and its contactor[s].

The Principal Contractor shall prepare an investigation report for all environmental incidents. The report is to include:

- Summary of the environmental incident, describing the:
    - Nature of the incident.
    - Details of any pollutant released including the type and quantity of pollutant released.
    - Location for the incident (e.g. grid reference).
- Receptors that were or could have been impacted.
- An analysis of what led to the incident occurring.
- Summary of immediate actions taken to mitigate the incident.
- Summary of any remedial action required.
- Lessons learned and future measures or actions to be implemented.

Company will verify the incident investigation and agree with its contractors any further actions which are to be implemented to prevent a reoccurrence of comparable incidents. A timeline for the implementation of all actions shall be established and the contractors shall provide details of when they have been implemented.

An incident investigation shall be complete when all details have been recorded on file.

### 7.1.6 Emergency Contacts

In the event of an emergency occurrence at the Site, the Client and its contractors shall determine the relevant statutory and regulatory bodies that must be notified. Notification shall be in accordance with the measures outlined above in **Section 7.1.5**.

**Table 7.2 Emergency Contacts-**

| **Emergency Contacts** | |
|---|---|
| **Contact** | **Contact Details** |
| Client Site Manager – [Name/TBC] | TBC |
| Contractor Site Manager – TBC | TBC |
| Contractor Environmental Manager – TBC | TBC |
| Boskalis Emergency number (24/7) | +31 (0) 78 6969 999 |
| National Resources Wales | 0300 065 3000 |
| Health and Safety Executive (HSE Construction) | 01519 229 235 |
| Local Authority – Flintshire County Council | 01352 703020 |
| Major Spill Emergency Response | TBC |
| Fire | 999 / 112 |
| Police | 999 / 112 |
| Ambulance | 999 / 112 |

## 7.2 Incident Response

All pollution incidents should be managed through the **STOP – CONTAIN – NOTIFY** concept. As soon as an incident is identified, the first action should be **STOP** and prevent further discharge to drainage/river/ground.

**CONTAIN** may constitute control of discharge in the event of a spill, or cessation of works if it is the works that are resulting in the incident, e.g. halting excavations until silt runoff is contained. It is recognised that due to personal health and safety risks it may not always be safe to stop the source of the spill, for instance if a significant volume of an unidentified substance has been released.

**NOTIFICATION** should take place as soon as practicable and frequently can take place while further release is being stopped or while a spill is being contained. The emergency contact numbers outlined in **Table 7.2** should be used.

Guidance on managing contaminants and limiting adverse effects is provided in the Oil Spill Containment Plan.

## 8.0 GENERAL ENVIRONMENTAL REQUIREMENTS

### 8.1 Roles, Responsibility and Authority

The Principal Contractor shall make available sufficient time and resource for the effective management of environmental risks that could arise during construction work. This includes appointing adequately qualified personnel with knowledge and capability in the environmental management of construction site works. Persons having responsibility for environmental site management, and in particular any persons required to undertake and oversee response to any incidents with potential environmental consequences, shall be empowered to make decision and take appropriate action necessary to avoid or mitigate adverse environmental effects, even when this may lead to delay and/or additional cost to the Principal Contractor.

#### 8.1.1 Project Roles

The PoA team and all appointed contractors will be responsible for ensuring that the potential risks to the environment are adequately avoided or controlled by the application of measures as documented within this CEMP.

During the execution of the activities foreseen by the Project, the Contractor/Subcontractor:

- will carry out its activities in accordance with the applicable national legislation, its own and the Company's standards, the Environmental Statement (attached to the TCPA) and the Register of Environmental Actions and Commitments (REAC) and international best practices;
- will be responsible for the environmental impacts resulting from its activities and operations and for implementing all measures necessary to avoid or, if not possible, reduce and mitigate them, in accordance with Contractual requirements;
- will react promptly to accidental events for which it is responsible to mitigate the resulting impacts as much as possible;
- will implement this CEMP and all identified mitigation and monitoring measures and operational control actions.

The most important Project Functions, responsible for development, implementation and monitoring of the CEMP are identified and described in the following sections.

##### 8.1.1.1 **Project Director / Project Manager**

The Project Director (PD) / Project Manager (PM) is responsible for ensuring that the Project is executed in a responsible manner that is protective of human health and environment.
The responsibilities of the PD / PM are as follows:

- supervise compliance with regulatory requirements and adherence to applicable standards and procedures to which the Contractor has committed to adhere;
- approve this document and ensures its application on Site with the support of the Project HSE Manager and the Project Environmental Manager;
- ensure the availability of adequate funds and human resources for the implementation of this document;
- define the Project strategies in relation to environmental protection measures, supervising the planning and scheduling of activities;
- support initiatives and awareness campaigns on environmental issues.

#### 8.1.1.2 **Project HSE Manager**

The Project HSE Manager (PHSEM) manages and supervises the Project activities of competence related to health, safety and environment during the development of the Project, ensuring the correct application of the HSE Management System of the Contractor; its function includes:

- ensuring the review of the contractual documents of competence;
- controlling the activities related to the HSE aspects of the Project carried out by the various functions;
- ensuring the preparation of the Environmental Plans for the construction phase in accordance with the HSE objectives of the Project;
- ensuring the review of the Project documents on environmental matters, to verify compliance with the HSE Management System of the Contractor;
- coordinating the HSE audit activities for the Project;
- ensuring, in line with the contractual constraints and local legislation and coordinating with the other Project positions, the definition of the environmental requirements to be considered and applied in all phases of the work, subsequently verifying their implementation.

#### 8.1.1.3 **Environmental Manager**

The Environmental Manager (EM) shall:

- ensure that the Project activities comply with the requirements of environmental legislation;
- provide guidance to the Environmental Team and the Project on environmental management;
- be overall responsible for the implementation and monitoring of the environmental program;
- monitor the implementation of the environmental management requirements as described in this Plan;
- ensure support to the PM in relations with the Client and with the relevant environmental bodies;
- report environmental incidents to the Client and implement corrective actions of the CEMP when necessary;
- be responsible for ensuring that the CEMP is developed in a timely manner and in accordance with applicable national legislation, current authorisations and international best practices;
- ensure that adequate knowledge is provided to all workers and interested parties regarding the contents of this Plan;
- ensure that adequate training on the contents of this procedure are identified, developed and provided;
- ensure that any corrective actions are correctly identified and implemented;
- identify and develop specific environmental campaigns to raise awareness of environmental issues;
- develop environmental incident management procedures and spill response plans to ensure a rapid and effective response in the event of an environmental incident.

#### 8.1.1.4 **Construction Manager**

With the support of PHSEM and EM, the Construction Manager (CM) is responsible for:

- ensuring that the planning and programming of the Project take into account the environmental management aspects, coordinating to this end with the other organizations and functions involved in the implementation of the Project and ensuring the most appropriate solutions;

- ensuring the coordination of the environmental management activities with the other Project plans and programs, the Construction Plans, defining the construction methods, logistics, activity programming, tools and control methods;
- participating, as far as it is competent and in conjunction with PHSEM, in the development, updating and adjustment (if necessary) of the CEMP.

#### 8.1.1.5 **Field HSE Manager**

In collaboration with CM, Project HSE Manager and Field EM, the Field HSE Manager (FHSEM) has the following responsibilities:

- ensure adequate resources and facilities provided at Site for HSE management in compliance with national legislation and international standards;
- provide training and awareness to all relevant workers to ensure proper implementation of the HSE management plans and procedures;
- monitor Site conditions to ensure that HSE mitigation measures are being implemented;
- monitor the correct implementation of HSE procedures on site;
- coordinate the HSE inspections and audits, ensure the follow-up actions.

#### 8.1.1.6 **Field Environmental Manager**

The Filed EM's responsibilities include:

- ensuring compliance of the CEMP with the requirements of the Contractor and the Company;
- verifying the implementation of the CEMP for construction site activities;
- verifying the implementation of the requirements contained in the environmental permits;
- participating in accident investigations;
- planning and supervising the application of environmental procedures;
- updating and providing training on environmental issues;
- planning and carrying out environmental audits, checks and inspections;
- managing environmental reporting for the Contractor;
- developing and updating the CEMP in relation to possible legislative changes or operational activities;
- ensuring that all personnel are aware of the environmental management strategy in the following Plan and comply with it;
- planning and carrying out environmental emergency response drills;
- participating in the analysis of the causes of any accidents and ensuring the collection of data;
- carrying out the analysis of environmental data and formulating the necessary improvement proposals;
- ensure control over the correct compilation of documentation in compliance with current legislation;
- keep all documents relating to environmental management archived, organized and available for reporting and auditing.

#### 8.1.1.7 **Workers**

All personnel are responsible for their environmental performance during the Project.
As a minimum, personnel are expected to:

- comply with the requirements of applicable environmental legislation and environmental authorities, including the specific requirements of Project approvals and supporting documentation;
- be responsible for their environment and for fully complying with all plans, procedures and other work instructions applicable to their work activities;
- undertake activities in an environmentally responsible manner;
- undertake activities in accordance with agreed environmental management plans, procedures and working method statements;
- ensure they are aware of the identity of key persons relevant to environmental management on the site;
- report any non-compliance with the CEMP, environmental management procedures or regulatory approval requirements where identified;
- report any incidents which have resulted in, or may potentially result in, environmental damage;
- ensure they attend any environmental training provided relevant to their role and responsibilities.

#### 8.1.1.8 **Subcontractors**

All environmental requirements for which the Contractor is responsible fall to the Subcontractors, which shall carry out their activities in accordance with the regulatory provisions, this Plan and the ongoing environmental authorisation process.

Each Subcontractors shall have an operational site structure (e.g. presence of a Field EM) adequate to guarantee complete and efficient control of the environmental aspects of the field and to carry out the necessary management and coordination activities for these issues.

Contractor will provide each Subcontractor with the copy of this document prior to start of their activities and organise additional trainings to all Subcontractors, if required. Subcontractors are responsible to Contractor for respecting the provisions of this document and are subject to Contractor's supervision and audits. Subcontractors are responsible to provide Contractor with the data of their environmental performances.

### 8.2 Competence, Training and Awareness

The Principal Contractor shall ensure that appropriate awareness training is delivered to all site operatives and only appropriately qualified Subcontractors are appointed.

Every member of the workforce shall be required to participate in a site induction prior to starting work on the site. The level of induction training will depend upon the position and duties the person is to perform. The site induction will include:

- A brief overview of the works to be undertaken and any potential environmental aspects associated with the construction activities.
- A summary of the sensitive environmental receptors near the site.
- An overview of the applicable environmental mitigation and pollution control measures.
- An overview of the health and safety management measures in particular emergency response procedures required at the site.

Company will require its Principal Contractor to provide continuing training and awareness raising of the workforce. This can be delivered in the form of Toolbox Talks tailored to the specific environmental mitigation

measures required dependent on the work activities being undertaken and to raise awareness on environmental best practice.

Records of all inductions and Toolbox Talk deliveries shall be maintained at the site office. Copies shall be made available to the Company on request.

### 8.2.1 Internal Communication

The Principal Contractor's CM, Field EM or equivalent person and other relevant team members shall meet weekly to review the status of environmental aspects including but not limited to:

- Works activities underway and planned.
- Mitigation measures required to be implemented.
- Results of weekly inspections and any audit results/feedback.
- Any corrective and preventative actions required to be implemented.
- Identification of areas for continual improvement.
- Status of staff competence and training needs.
- Status of CEMP and of any required consent and approvals and the need for review and updating.

Company shall be informed of the outcome/minutes of all such meetings.

Additional and ongoing communication of environmental performance and requirements is to be determined by the Principal Contractor and provided as appropriate.

### 8.2.2 Notice Boards

The Contractor provides and maintains project environmental notice board(s) which are positioned to ensure all operatives can review the notice board a daily basis. The notice boards should be updated at least monthly. As a minimum, the notice boards shall contain:

- Clients Environmental Policy.
- Emergency contacts list.
- Relevant statutory and non-statutory advice and guidance.
- Description of the key environmental risks and intended risk mitigation measures.

These environmental notice boards will be situated in prominent positions including the main reception area of the site office.

### 8.2.3 Toolbox Talks

Toolbox Talks will be used to inform all site personnel of key information concerning the management of the site, procedures to be followed and expected standards / controls when working on the project. The Toolbox Talks will cover a broad range of topics including those related to best practice environmental management.

A record of Toolbox Talks will be kept on site, starting date, description of non-conformance, potential implications, proposed corrective actions, individual responsible and target data. Toolbox Talks shall include, but will not be limited to, instances where:

- There is a change to existing legislation, which requires an operation change.
- Site inspections or audits have identified corrective actions which require communicating.
- There are significant changes in environmental conditions i.e. heavy rainfall.

The frequency and topics of the Toolbox Talks shall depend upon the phase construction. They shall be provided as often as necessary to address site-specific environmental requirements.

### 8.2.4 External Communication

The Principal Contractor, with the Company's agreement, will notify residents and relevant businesses of upcoming works at least two weeks before starting, typically via letter. A Liaison Officer may be appointed to handle inquiries and complaints, and a hotline or email may be provided during the construction stage.

All received complaints will be assessed and addressed promptly, aiming for same-day contact with the complainant. The CM or an equivalent person will be the contact for regulatory authorities, and any communications received will be reported to the Company immediately. A record of all communications will be maintained, with incident-related communications detailed in **Section 0** of this CEMP.
The workforce will be informed during induction to direct any public inquiries to the CM, who will document these and inform the Company's Project Team.

## 8.3 Documentation

The Field EM shall be responsible for documenting and retaining safe all suitable records relating to environmental issues at the site and/or arising from site operations. Documents shall be stored in a suitable manner and backups created to safeguard the records. The CEMP shall be controlled document and authorised latest version shall be signed and dated by the responsible person[s]. Other site data records and environmental management document would include, but not necessarily be limited to the following:

- Copies of relevant consents, permissions, or other approvals/ authorisations.
- Environmental data records including waste transfer notes/records of waste collection and treatment/ disposal.
- Records of any environmental incidents including actions taken and resolution.
- Records of all plant/equipment entering / leaving site together with any relevant compliance documentation (for instance in respect of noise or air pollutant emissions class).
- Copies of any enforcement notices or instructions issues by the local authority or statutory regulatory body.
- Record of any prosecutions pending or resolved, and any penalties enforced.
- Records of daily site inspections.
- Records of weekly/monthly audits and minutes of environmental team briefings.
- Records of staff training including site inductions and toolbox talks.

## 8.4 Monitoring

The Principal Contractor shall be responsible for managing environmental performance during all site works. This will be supported with a programme of monitoring, inspections and audits.

### 8.4.1 Daily Inspections

Daily inspections shall be undertaken by the Contractor and recorded as follows:

- Visual inspection of the site perimeter to check for dust deposition (evident as soiling and marking) on vegetation, cars and other objects.
- Visual inspection of the local haul roads to check their condition to ensure there is no build-up of dust or earth deposits liable to cause dust emissions as vehicles pass.
- Vehicles, equipment and plant inspections shall be completed to check the absence of damage or maintenance issues and that it is correctly functioning.
- Visual inspection of all acoustic barriers / screening to check they are present and in good condition.
- Visual inspection of waste containers and waste storage areas to verify wastes are being correctly segregated and to confirm the absence of mixing of hazardous and non-hazardous wastes.
- Visual inspection of all site areas to ensure there is no deposited or wind-blown litter.
- If a waste collection is made, a check shall be made of the Waste Transfer Note / Hazardous Waste Consignment Note provided for the collection.

On all days when potentially dust emitting activities are being conducted, the level of dust generation shall be kept under constant review. A record shall be added to the official site diary when such activities are conducted, the dust emission conditions observed and when necessary, the mitigation measures taken.

Any elements of the site management found to be in an unsatisfactory condition during the site inspection shall be addressed on the day. In the event it is not possible to address the matter on the day it is raised; a note of the reason why shall be made on the inspection record sheet.

### 8.4.2 Audits

Only suitably trained and competent staff will be authorised to perform environmental audits.

Audits (or at a suitable frequency to be determined by the nature / duration of the work) of the worksites and Contractors shall be undertaken by or on behalf of the Company. All aspects of the environmental management at the site shall be assessed against this CEMP. The audit shall include checks of the site records including the daily inspection record sheets, vehicle arrival logs and waste disposal paperwork. All audits shall be documented; where audit actions are raised, close out of these actions shall be assessed at the following audit.

An audit of an Environmental Management Process will be undertaken by the EM throughout the Project duration and will typically cover the activities identified in the above chapters.

### 8.4.3 Non-Conformity and Corrective Action

Where the Company has a concern or raises an issue for resolution, or where potential issues are raised from an inspection or audit of the site/ operations, or by a regulatory authority, the Contractor shall investigate the root cause and any implications arising from the issue and shall if necessary following discussion with the Company implement measures to rectify the problem.

The Contractor shall monitor the effectiveness of the corrective action and report the outcome to the client and where relevant the regulatory authority. All documentation of the issue/ event and corrective action/ outcome shall be retained by the contractor.

### 8.4.4 Data Reporting

The Principal Contractor may be required to submit the Company all relevant data on the following (list non exhaustive):

- Energy usage (i.e. electricity meter readings and diesel generator fuel used/delivered to site).
- Water consumption (i.e. water meter readings or bowser water deliveries to site).
- Waste collections.
- Heavy Duty Vehicles entering/leaving site.

The Principal Contractor shall comply with any additional reporting requirements that may be introduced through the conditions of any agreements or permits.

## 8.5 Review and updates

A management review of the performance of the Environmental Management System will be undertaken yearly and will include the Company's PM and senior management (as a minimum this should include the PD, HSEQ Manager and senior corporate representative) key personnel including the Field Environmental Manager.

Matters such as staffing, training, matters arising from audits and inspections and performance against Key Performance Indicators (KPIs) will be discussed and where there is a shortfall in performance, actions shall be agreed to rectify this.

## APPENDIX A – INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

## Liverpool Bay CCS Ltd

# HYNET CARBON DIOXIDE TRANSPORTATION AND STORAGE PROJECT - OFFSHORE

### Environmental Statement
### Volume 4, appendix T: Invasive Non-Native Species Management Plan

EHE7228B
Liverpool Bay CCS Limited
Final
February 2024
Offshore ES
Invasive Non-Native
Species Management Plan

rpsgroup.com

| Document status | | | | | |
|---|---|---|---|---|---|
| **Version** | **Purpose of document** | **Authored by** | **Reviewed by** | **Approved by** | **Date** |
| FINAL | Final | RPS | Eni UK Ltd | Eni UK Ltd | February 2024 |



**Prepared by:**

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**Prepared for:**

**Liverpool Bay CCS Limited**

# Glossary

| Term | Meaning |
|---|---|
| INNS | Any non-native animal or plant that can spread causing damage to the environment, the economy and human health. |
| Non-native Species | The equivalent of 'alien species' (as used by the Convention on Biological Diversity (CBD)) and 'non-indigenous species' (as used by the OSPAR Commission and the UK Marine Strategy); it refers to a species intentionally or unintentionally introduced outside its native range by human actions. |
| Project | The HyNet Carbon Dioxide Transportation and Storage Project. |
| Proposed Development | The offshore components of the Project which are subject of this Environmental Statement, as described in Chapter 3: Proposed Development Description. |

# Acronyms and Initialisations

| Acronym/ Initialisation | Description |
|---|---|
| CBD | Convention on Biological Diversity |
| CCS | Carbon Capture Storage |
| CMS | Construction Method Statement |
| $CO_2$ | Carbon Dioxide |
| EIA | Environmental Impact Assessment |
| ES | Environmental Statement |
| EMP | Environmental Management Plan |
| HRA | Habitats Regulations Assessment |
| INNS | Invasive Non-Native Species |
| INNSMP | Invasive Non-Native Species Management Plan |
| LAT | Lowest Astronomical Tide |
| MCAA | Marine and Coastal Access Act |
| MHWS | Mean High Water Springs |
| MMMP | Marine Mammals Mitigation Plan |
| MMV | Monitoring, Measurement and Verification |
| PDE | Project Design Envelope |
| PWA | Pipeline Works Authorisation |
| SAC | Special Area of Conservation |
| UK | United Kingdom |
| WFD | Water Framework Directive |

# Units

| Unit | Description |
|---|---|
| m | Metre (distance) |
| km | Kilometre (distance) |
| kV | Kilovolt (electrical potential) |

# Contents



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# 1 INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

## 1.1 Introduction

### 1.1.1 Background

This Invasive Non-Native Species Management Plan (INNSMP) has been prepared by RPS on behalf of Liverpool Bay CCS Ltd (the Applicant) to support the Environmental Statement (ES) for the HyNet Carbon Dioxide Transportation and Storage Project - Offshore (hereinafter referred to as the 'Proposed Development'). This INNSMP considers the installation, operation and maintenance and decommissioning of the Proposed Development within the waters of Liverpool Bay (Figure 1.1).

Several invasive non-native species (INNS), including the high – medium risk American lobster *Homarus americanus*, Chinese mitten crab *Eriocheir sinensis*, the kelp wakame *Undaria pinnatifida*, Japanese skeleton shrimp *Caprella mutica*, wireweed *Sargassum muticum* and Pacific oyster *Crassostrea gigas* have been recorded within Liverpool Bay (Hurst, 2016; Solway Firth Partnership, 2015) although the majority of records were only single or a few individuals found within ports and harbours.

This management plan has been drawn up using the Precautionary Principle to assess the risk of the introduction and spread of INNS associated with the Proposed Development and to present appropriate measures to minimise these risks as much as possible following best guidance (GB INNS, 2023; Cook *et al.,* 2014; Payne *et al*., 2015). Furthermore, the INNSMP addresses a comment made within the Scoping Opinion by The Offshore Petroleum Regulator for Environment and Decommissioning whereby:

'*Section 7.2.7: Potential Mitigation, where it states 'Compliance with available guidance on mitigating the introduction and spread of INNS', we advise that a full Biosecurity Risk Assessment and Invasive Non-Native Species (INNS) Management Plan is completed in relation to all marine operation activities associated with the Project. The risk assessment and management plan should include consideration of all activities, vehicles and equipment used as well as how the risk will be minimised through appropriate mitigation and adherence to best-practice guidance and management measures. The risk assessment should include a review of all the available data in relation to the presence of marine INNS where applicable to the Project, and the potential risks associated with each species identified.'*

### 1.1.2 Scope

The scope of the INNSMP is for the activities taking place within the Proposed Development seaward of Mean High Water Springs (MHWS). This INNSMP considers the installation, operation and maintenance and decommissioning of the Proposed Development within the waters of Liverpool Bay (Figure 1.1).

### 1.1.3 Purpose

This document provides an outline INNSMP aimed at providing an overview of the aspects that will form the basis of the INNSMP. The INNSMP will be further developed post-application in advance of the construction phase of the Proposed Development.

The purpose of the INNSMP is to set out the approach to INNS management and mitigation in respect of the Proposed Development. The management plan will provide an outline of the measures proposed to be implemented to facilitate biosecurity control and to minimise potential impacts on the local and wider environment.

The INNSMP will ensure all procedures pertaining to marine works (including construction, operation and maintenance and decommissioning of subsea structures) and vessel operations follow best practice guidance,

preventing and reducing the risk of the possible spread or introduction of INNS into the waters of the Proposed Development.

The method employed follows the principles of the 'Great Britain (GB) INNS Strategy' (GB NNSS, 2023). The INNS Strategy follows a hierarchical approach which emphasises prevention, followed by early detection and rapid response, and finally long-term management and control. The key outcomes of the GB INNS Strategy are that by 2030 it will have achieved:

- **Prevention:** reduce establishments of INNS by at least 50% compared to 2000 levels.
- **Surveillance, early detection and monitoring:** significantly improve our detection and monitoring capability, including increasing inspections and investigations.
- **Management:** eradicate, control or contain INNS – prioritised by greatest impact and the likelihood of success.
- **Prioritisation and risk analysis:** set out an agreed approach to the prioritisation of species based on risk and likelihood of success to ensure our efforts are focused on where they can achieve the greatest benefit.
- **Evidence:** commission the research priorities outlined in the Evidence Strategic Plan, to ensure that the strategy is based on the best available evidence and identify gaps and priority areas for further development.
- **Awareness raising:** increase awareness of INNS issues and promote appropriate changes in behaviour or attitudes throughout all relevant sectors and among the general public.
- **Coordination:** improve coordination of actions within governments, government-associated bodies, and key actors outside government.

This INNSMP will be finalised prior to construction and will remain a 'live' document throughout the lifetime of the Proposed Development, with periodic updates by the Applicant during the construction, operational and maintenance, and decommissioning phase, as outlined within Section 1.4.7 (Evaluation and Review).

### 1.1.4 Document structure

The INNSMP is structured as follows:

- Section 1.2: Project Description;
- Section 3: Legislative Context and Consenting Process
- Section 4: Invasive Non-Native Species Management Plan Methodology; and
- Section 5: Invasive Non-Native Species Management Plan.

## 1.2 Project Description

This section provides the project characteristics, policies and consents relevant to the Proposed Development for the management of INNS, and how this INNSMP links with other management plans.

### 1.2.1 Proposed Development location

The Proposed Development is located in the Irish Sea, within Liverpool Bay, approximately 12 km to the north of the Welsh coastline and 2 km west of the English coastline. It covers an area of approximately 576.82 km$^2$. The application for a marine licence for the Proposed Development is shown as a red line boundary which encompasses all the planned and modified infrastructure (Figure 1.1). This includes the pipeline and cables corridor (up to Mean High Water Springs (MHWS)). The pipeline and cables corridor shore approach are located to the north of Talacre in Flintshire, Wales based at the mouth of the Dee Estuary (Figure 1.1).

### 1.2.2 Proposed Development characteristics

The key offshore infrastructure of the Proposed Development will include both new and repurposed existing infrastructure. The new and re-purposed infrastructure will be located within the Proposed Development (Figure 1.1).

The key offshore infrastructure of the Proposed Development will include:

- New Infrastructure:
  - Installation of a new Douglas CCS platform to replace the existing Douglas Process platform to receive $CO_2$ from the onshore Point of Ayr (PoA) Terminal and distribute $CO_2$ to the Hamilton Main, Hamilton North, and Lennox wellhead platforms and when necessary, provide heating to the $CO_2$ stream. Installation of the new Douglas CCS platform will include up to eight driven piles.
  - Installation of new sections of pipeline to connect the new Douglas CCS platform and the existing subsea natural gas pipelines.
  - Installation of new topsides on the Hamilton Main, Hamilton North, and Lennox wellhead platforms to receive and inject $CO_2$ into the depleted hydrocarbon reservoirs.
  - Implementation of a programme of Monitoring, Measurement and Verification (MMV) activities - This includes the drilling of two new monitoring wells, one at Hamilton North and one at Hamilton Main.
  - Installation of two submarine 33 kilovolt (kV) power cables, with integrated fibre-optic cable connections (35 kilometres (km) from PoA Terminal onshore to the modified Douglas platform, including within the intertidal/foreshore area up to MHWS, within Welsh waters only).
  - Installation of new submarine 33 kV power cables with integrated fibre-optic connecting the modified Douglas platform with the Hamilton Main (12 km; 33 kV), Hamilton North (15 km; 33 kV) and Lennox (35 km; 33 kV) platforms.
  - Installation of cable and/or pipeline protection, at crossings of existing cables, and in areas where cable burial is not deemed feasible, or as a remedial secondary protection measure if the target cable depth of lowering cannot be achieved.
- Repurposing infrastructure:
  - Repurposing of the existing subsea natural gas pipelines for their change of use from hydrocarbon to $CO_2$ service.
  - Development of the Hamilton Main, Hamilton North and Lennox reservoirs for $CO_2$ storage through the drilling and re-completion of injection wells by side-tracking existing production wells. This includes drilling and recompletion operations, all of which will be within the existing footprint (template) of each platform.
  - Implementation of a programme of MMV activities - Additional monitoring wells will be created from the recompletion of existing wells within the existing footprint (template) of each platform: one monitoring well created by side-tracking an existing well in Lennox; and two sentinel wells, one in Hamilton North and one in Lennox.

To facilitate the construction, operation and maintenance, and decommissioning of the Proposed Development, vessels will be used.

For further information on the Project Description, see volume 1, chapter 3 of the ES.

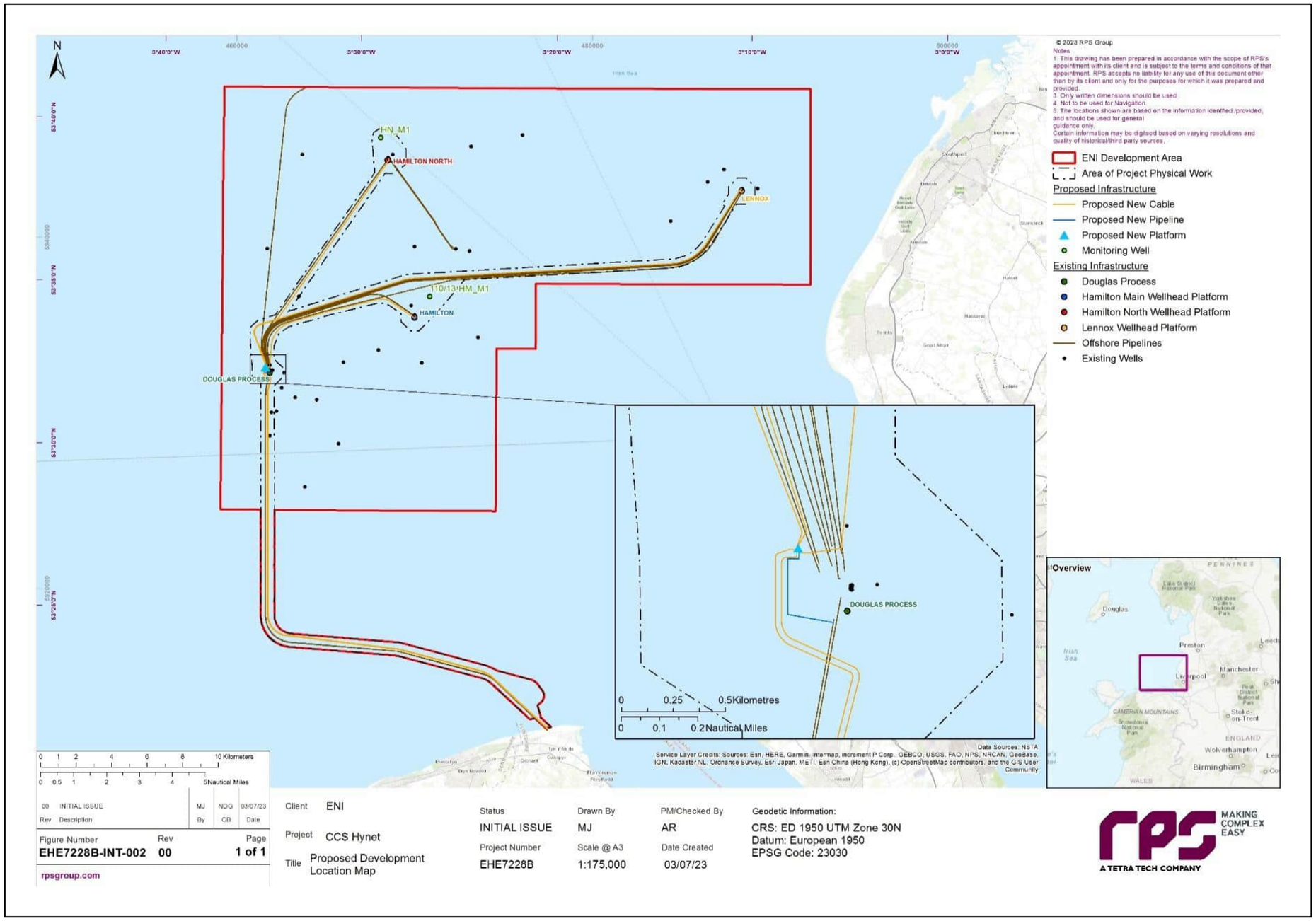


**Figure 1.1: Location Overview Of The Proposed Development**

# 1.3 Legislative context and consenting process

## 1.3.1 Policy

### 1.3.1.1 International

**Convention on Biological Diversity (CBD)**

This convention arose from the United Nations Conference on Environment and Development held in Rio in 1992. Within the framework of the convention, there are 15 Guiding Principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species. These principles provide an international framework for governments and other organisations to develop effective strategies to prevent the introduction, control and eradicate invasive non-native species. Article 8(h) states that each Contracting Party shall prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.

Acknowledging the growing threat from INNS, the CBD has provided a major driver for international action. One of its guiding principles calls for national strategies on INNS. In response to this, devolved governments across the UK have produced the 'GB INNS Strategy' (GB NNSS, 2023) as described in Section 1.1.3. This Strategy provides the framework to support the coordination of policy and action across GB and aligns these efforts with national and international biosecurity and environmental strategies.

### 1.3.1.2 National

**EU Regulation (1143/2014) on the prevention and management of the introduction and spread of invasive alien species.**

EU Regulation 1143/2014 was retained in domestic law under the European Union (Withdrawal) Act 2018. It was amended through several statutory instruments to ensure operability following the UK's exit from the EU but applies to Great Britain only.

This Regulation sets out rules to prevent, minimise and mitigate the adverse impact on the biodiversity of the introduction and spread within the Union, both intentional and unintentional, of invasive alien species.

**The Invasive Alien Species (Enforcement and Permitting) Order 2019**

The Invasive Alien Species (Enforcement and Permitting) Order 2019 came into force on 1 December 2019 and pertains to England and Wales. It contains provisions relating to offences, penalties, enforcement, licensing and permitting to meet the requirements of the Regulation.

## 1.3.2 Consents

This section provides a summary of the consenting process and associated legislative requirements being followed for the Proposed Development.

Table 1.1 sets out the permits and licences pertinent to the Proposed Development and to which the following legislation applies. The applications will be supported by an ES, as well as a Water Framework Directive (WFD) assessment, and a Report to Inform Appropriate Assessment (RIAA).

Should additional pre-construction licences be required, these will be discussed and agreed upon with the relevant consent authority during the pre-construction phase of the Proposed Development.

**Table 1.1: Consents Applicable To The Proposed Development**

| Activity | Permit / Licence / Requirement | Key Legislation |
|---|---|---|
| Benthic Ecology Baseline Surveys:<br>– Intertidal Benthic Survey<br>– Subtidal Benthic Survey | • Marine Licence (Band 1) from Natural Resources Wales-Marine Licensing Team (Marine Management Organisation exemption)<br>• OPRED Survey Notification<br>• Crown Estate seabed survey licence | • Marine and Coastal Access Act (MCAA) 2009 |
| Pipeline repurposing / Installation of new pipeline spools to new platform | • Pipeline Works Authorisation updates/renewals for the repurposed pipeline<br>• Marine Licence Band 3 | • The Pipeline Safety Regulations 1996<br>• The Offshore Chemicals Regulations 2002 (as amended)<br>• MCAA |
| New Platform Installation | • Marine Licence Band 3<br>• Consent to Locate for fixed installation | • MCAA 2009<br>• Energy Act 2008 |
| Drilling | • Master Application Templates and Subsidiary Application Templates for new wells, side-track drilling and well intervention | • Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020<br>• The Offshore Chemicals Regulations 2002 (as amended)<br>• Part 4A of The Energy Act 2008 (as amended)<br>• The Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 (as amended)<br>• Consent for a Marine Geological Survey or Investigation under The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (as amended) |
| Environmental Impact Assessment | • Scoping<br>• ES Production<br>• Screening and appropriate assessment<br>• WFD assessment<br>• Submission and Public Notice | • The Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020;<br>• The Offshore Environmental Impact Assessment (The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended));<br>• Habitat Regulations Assessment (Conservation of Habitats and Species Regulations 2017 (as amended); Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended));<br>• EU (Withdrawal) Act 2018<br>• The Habitats and Birds Directive<br>• Water Framework Directive; |
| Carbon Storage | • Carbon Dioxide Appraisal and Storage Licence already awarded by Oil and Gas Authority (now North Sea Transition Authority)<br>• Crown Estate Lease<br>• Carbon Storage Permit | • Energy Act 2008 |

| Activity | Permit / Licence / Requirement | Key Legislation |
|---|---|---|
| Cable Laying and associated activities | • Marine Licence Band 3 in Welsh Waters<br>• Pipeline Works Authorisation for inter-platform cables in English Waters | • MCAA 2009<br>• The Pipeline Safety Regulations 1996<br>• The Offshore Chemicals Regulations 2002 (as amended) |

### 1.3.3 Linkages with other consents management plans

The INNSMP is consistent as far as possible with other relevant consent management plans prepared to inform the implementation of the Proposed Development. Additionally, management plans will be added as and when available. These are set out in Table 1.2 below with details of the linkages presented.

**Table 1.2: Linkages With Other Consent Management Plans**

| Consents Management Plan | Linkage with the INNSMP |
|---|---|
| Environmental Management Plan (EMP) | The EMP provides the overarching framework for environmental management during the construction, operational and maintenance, and decommissioning phases of the Proposed Development. This can include proposed monitoring, methodologies and timings, along with a range of management plans including stakeholder engagement, traffic, waste, emergency response, invasive non-native species management and decommissioning and restoration. |

## 1.4 Invasive Non-native Species Management Plan Methodology

This section outlines the process of creating an INNSMP using the best available evidence and following best practice guidance (Cook *et al.,* 2014, Payne *et al*., 2015). To make an accurate risk assessment of the Proposed Development, and derive a suitable INNSMP, a stepwise approach was taken as outlined in Figure 1.2 and described in detail below.

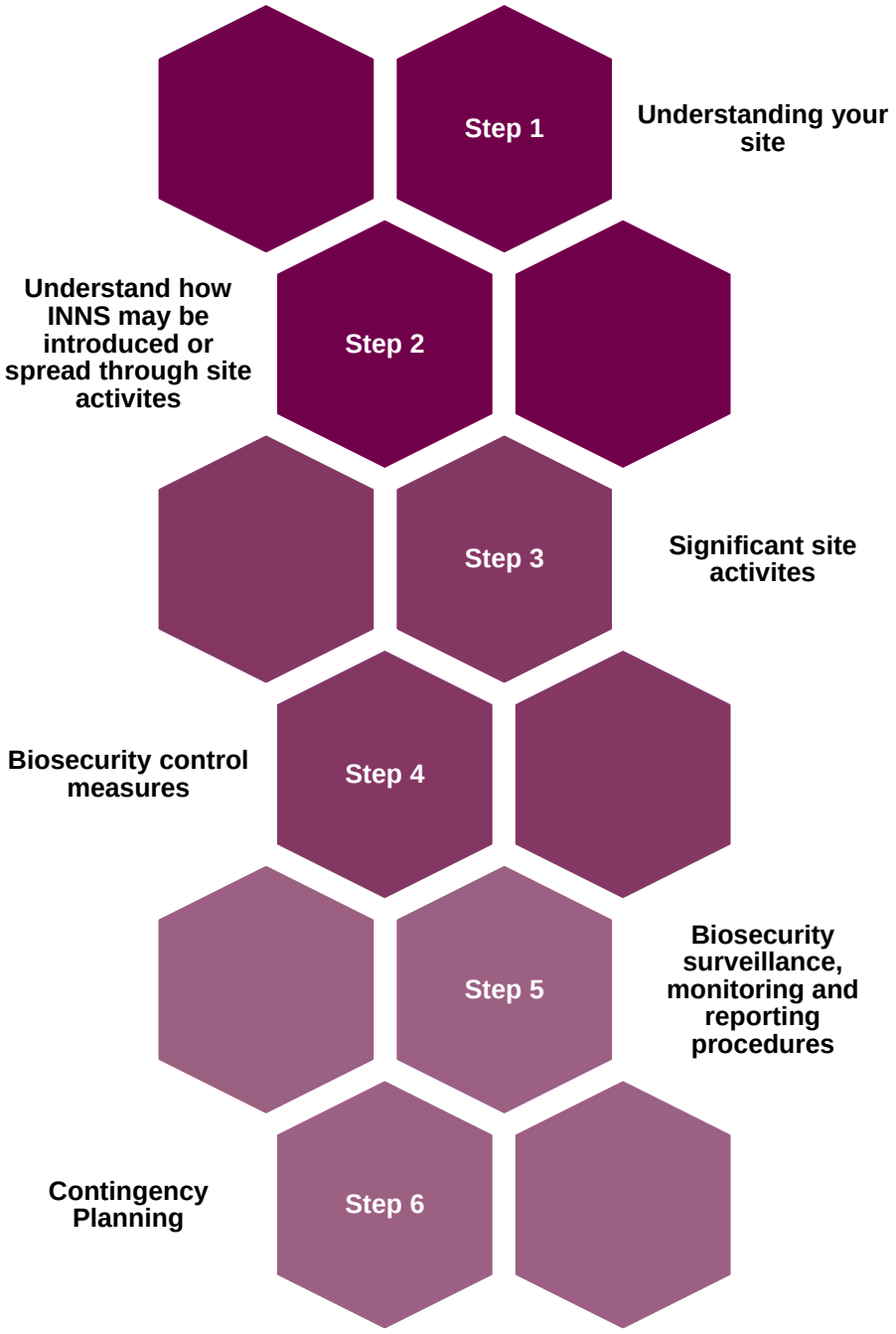


**Figure 1.2: Six Steps Used To Produce The INNSMP For The Proposed Development**

### 1.4.1 Step 1: Understanding your site

The first step in creating an INNSMP is to provide a detailed description of the site. This information should include the environmental conditions of the site, such as salinity, depth and the availability of hard substrate (Zaiko, 2007), details of any man-made structures, and if INNS are present within the site.

Understanding the salinity of the site will determine if INNS are present. The majority of marine flora and fauna are unable to tolerate freshwater due to osmoregulatory effects leading to death (Evans, 1980). An increased volume of freshwater flowing into a site will likely result in less hospitable conditions, decreasing the risk of INNS on-site; conversely, a fully marine site tends to represent a greater risk of INNS introduction to communities of native species (Tang *et al*., 2022).

The depth profile of a site can influence the ability of a species to colonise a site. Species live within an ecological range of tolerances, should a site be too deep for a species to live there, then it won't establish. Equally, within shallow environments, periods of tidal inundation and air exposure may decrease the likeliness of a species to establish.

The establishment of a species can also be influenced by the presence of a suitable hard substrate, for more sessile-encrusting organisms (Zaiko, 2007). Should a site only have gravel or sand present, then the likeliness of an INNS that requires a hard substrate to establish is reduced. Therefore, the presence of artificial structures increases the risk of INNS establishment, even if the structure has only been present for just a few weeks as INNS are quick to establish populations (Bax *et al*., 2003). Information related to any slow or stationary periods of work or climatic conditions that may increase biosecurity risk should be included.

If INNS have been found on-site, then the INNSMP should focus on reducing the risk of introducing new INNS and consider how to prevent the spread of existing INNS to other sites. Throughout the whole process, the precautionary principle should be followed, even if no INNS are present on site.

Using this information, a site can be assessed as having a low or significant risk of introducing or spreading INNS. Table 1.3 provides an example of this.

**Table 1.3: Example Of Low And Significant-Risk Sites (Payne *et al*., 2015)**

| Low-Risk Site | Significant Risk Site |
|---|---|
| • Supply of fresh water from a local river.<br>• Isolated from surrounding environments by walls or breakwaters (i.e. closed or semi-enclosed areas with little to no flow of water).<br>• Anti-fouling is used on artificial structures with periodic removal for air drying. | • Full salinity with no freshwater inflow.<br>• Artificial structures have no antifouling coating with no management in place for maintenance.<br>• The site has connectivity to similar environments. |

### 1.4.2 Step 2: Understand how INNS may be introduced or spread through site activities

In addition to understanding the site, consideration of pathways by which INNS may be introduced or spread is needed. This step should be iterative and revisited when the INNSMP is due for review. The questions and associated risks included in Table 1.4 have been adapted from Payne *et al*. (2015) and provide the type of questions to consider when creating an INNSMP.

**Table 1.4: Example Of Questions And Risks To Consider Whilst Creating An INNSMP (Payne *et al*., 2015)**

| Question | Yes = High | Yes = Medium | Yes = Low |
|---|---|---|---|
| 1. Has the vessel/ equipment just arrived from the local area? | | | |
| 2. Has the vessel/ equipment had an anti-fouling coating applied to submerged structures within the last 12 months (or the time recommended by the manufacturer)? | | | |
| 3. Are all the visible submerged surfaces of vessels or equipment to be deployed free of biofouling (a green 'slime' is OK)? | | | |
| 4. Do the visible submerged surfaces of vessels or equipment to be deployed have more than a green 'slime' coating? | | | |
| 5. Does the vessel or equipment to be deployed have noticeable clumps of algae and/ or animals clinging to the visible parts? | | | |
| 6. Has the vessel/ equipment just arrived from another country or region with similar environmental conditions (e.g. seawater temperature)? | | | |
| 7. Has the vessel/ equipment just arrived from a water body known to have INNS present? | | | |
| 8. Does the vessel/ equipment spend long periods of time stationary at sites in between anti-fouling treatments? | | | |
| 9. Is the vessel 'slow moving', such as a construction barge or drilling rig? | | | |

For example, a recreational vessel showing no signs of biofouling on the hull or below the waterline would be considered a low risk for introduction of INNS; conversely, a work vessel/barge that moves from site to site and is present on site for long periods may have a medium–high risk, and therefore a significant risk of introducing INNS to site. For this step, information on the vessels and equipment to be used will be obtained from the Project Description, see volume 1, chapter 3 of the ES. A condition assessment of all vessel/equipment to be used will be performed based on the questions in table 3.2. Any results from this assessment that fall within the 'Low' category will be assessed as 'Low' Risk. Any results that fall within the 'Medium' or 'High' category will be assessed as a 'Significant' Risk. This is considered to present a conservative approach to assessing the risk of introducing INNS.

### 1.4.3 Step 3: Identify significant site activities

The outputs from Step 2 will be used to compile a list of all the significant risks of introducing INNS as a result of the Proposed Development. This will include all vessels and equipment and the associated activities which have been assessed as being of significant risk of introducing INNS and their associated activities within the different phases of the Proposed development. Once this list has been created, the next step is to develop relevant and proportionate control measures.

### 1.4.4 Step 4: Biosecurity control measures

The outcomes of Steps 1 – 3 will be used to guide the biosecurity measures which should be implemented. Measures to control the introduction or spread of INNS must be effective, clear, realistic and easy to communicate to others. These measures must also consider how much control is enforceable over the site. A list of example control measures can be found within Cook *et al*. (2014), and Payne *et al*. (2015), many of which are included in the INNSMP (see section 1.5.4). Where possible, biosecurity measures should be included in the in-design stage of a new development and aim to 'design out' any possible significant risk of introducing or spreading INNS.

### 1.4.5 Step 5: Biosecurity surveillance, monitoring and reporting procedures

This step will outline what procedures should be followed in the event of discovering and positively identifying an INNS on-site. All staff and other site users should be encouraged to report any unusual sightings to the biosecurity officer.

### 1.4.6 Step 6: Contingency plan

In the event of the failure of the 'prevention', 'early detection' and 'rapid response' methods to effectively manage INNS introduction (section 1.5.6), a contingency plan will be created. This document should be short, provide a step-by-step approach to action and be accessible to all staff. This plan will review the identified listed activities, identify potential biosecurity control failures and recommend actions for effective management. For example, if a vessel had been wrongly assessed as low risk and introduced an INNS to the site, the introduced species would be sampled and identified, with the relevant authorities notified, followed by further containment and management measures being sought.

### 1.4.7 Evaluation and review

Following completion of the INNSMP, a clear recording system and review cycle date will be put in place to refine and update the INNSMP as required in line with relevant regulations and legislation.

## 1.5 Invasive Non-Native Species Management Plan

### 1.5.1 Step 1: Understanding your site

#### 1.5.1.1 Site description

The Proposed Development is located in Liverpool Bay in the Irish Sea, covering an area of about 576.82 km$^2$. It is positioned 12 km north of the Welsh coast and 2 km west of the English coast. The marine licence application area for the Proposed Development is shown as a red line boundary which encompasses all the planned and modified infrastructure including the pipeline and cables corridor up to MHWS, near the mouth of the Dee Estuary. The cable and pipeline make landfall within the Dee Estuary SAC. For further information see Section 1.2.1.

#### 1.5.1.2 Environmental conditions affecting biosecurity

Liverpool Bay is a region of freshwater influence with strong horizontal density gradients. The bay is also strongly tidally dominated, with a high tidal range and extensive intertidal areas. Freshwater enters Liverpool Bay from several rivers, including the Mersey, Dee, Ribble, Conwy and Clwyd, which collectively maintain a strong salinity gradient and freshwater plumes (Bricheno *et al.* 2014; Polton *et al.*, 2011; Howarth and Palmer, 2011).

The Proposed Development is located in water depths that range from 0.72 m Lowest Astronomical Tide (LAT) to 35 m LAT, with average water depths across the development area being approximately 20 m LAT. Shallower water is generally present towards the southern and eastern boundaries of the Proposed Development, including the pipeline and cables, situated in inshore waters.

Tidal currents in the area are relatively weak, with spring tides indicating a current flow speed of up to 1m/s, flooding to the east, and ebbing to the west, at a current flow speed of circa 0.8 m/s, as determined through the desktop study for volume 2, chapter 6 of the ES.

The 2019 EUSea Map datasets, describe the Proposed Development area as being composed predominantly of EMODnet seabed substrate folk classification 311 gravelly Sand, 212 (gravelly) Sand, and 211 Sand (EMODnet, 2019). Fine and sandy sediments are dominant in inshore waters and particle sizes range from

260 to 420 µm in areas with stronger currents and from 190 to 250 µm in areas with contrasting, weaker currents (Eni, 2019). This has been corroborated through volume 2, chapter 6 of the ES.

Overall, the influx of freshwater into Liverpool Bay and through the Proposed Development is likely to reduce the presence of INNS. Furthermore, tidal currents and a higher proportion of sand fractions, with no rock, found throughout the Proposed Development are likely to reduce the likeliness of INNS being present within the area. Therefore, the environmental conditions of the site can be assessed as **Low-Risk.**

### 1.5.1.3 Man-made structures

Section 1.2.2 listed the existing hard structures present within the Proposed Development area. These hard structures include the platforms, injection, monitoring and sentinel wells and pipelines. It is important to note that some of these structures may be buried, such as the power and fibre optic cables and pipelines. Furthermore, Gwynt y Mor offshore wind farm is located within the south-western most corner of the Proposed Development. These structures are likely to increase the potential for INNS to establish. Therefore, the presence of man-made structures are likely to increase the risk of INNS to the site and is assessed as a **Significant-Risk**.

### 1.5.1.4 INNS within the Proposed Development

The Proposed Development is located within the Dee Estuary Special Area of Conservation (SAC), which is primarily tidal rivers, estuaries, mud flats, sand flats and lagoons (including saltwork basins) (81% coverage). The SAC is designated for a range of Annex I habitats including mudflats and sandflats not covered by seawater at low tide, as well as Annex II species, such as sea and river lamprey (*Petromyzon marinus* and *Lampetra fluviatilis*, respectively). The Natura 2000 - Standard Data Form (JNCC, 2015) for the SAC identifies INNS as a high ranked negative impact pressure. However, it should be noted that this pressure is attributed to the terrestrial invasive saltmarsh species, common cord grass *Spartina anglica*. No marine INNS have, as of yet, been identified as a negative pressure on the Dee Estuary SAC.

National Biodiversity Network (NBN) data (2023) indicated no INNS are present within the Proposed Development area. However, within the wider area of the Proposed Development, Liverpool Bay is known to have INNS present within ports and harbours. As the Proposed Development will require the use of vessels during the construction, operational and maintenance, and decommissioning phases, INNS that have been identified within ports and harbours have been listed on a precautionary basis (Table 1.5).

**Table 1.5: Non-Native Species Known To Be Present Throughout Liverpool Bay**

| | Non-native Species[1] | Environmental risk to native Great Britain species[2] |
|---|---|---|
| **Present throughout Liverpool Bay:** | • American lobster *Homarus americanus*<br>• Chinese mitten crab *Eriocheir sinensis*<br>• Wakame *Undaria pinnatifida* | High Risk |
| | • Slipper limpet *Crepidula fornicata*<br>• Japanese skeleton shrimp *Caprella mutica*<br>• Wireweed *Sargassum muticum*<br>• Pacific oyster *Crassostrea gigas* | Medium Risk |
| | • Acorn Barnacle *Elminius modestus* | Risk not assessed / available |

[1] Sources: Hurst (2016); Solway Firth Partnership (2015); NBN Gateway (2023).

[2] According to assessment by GB Non-Native Species Secretariat (Risk assessment » NNSS (nonnativespecies.org)).

| | Non-native Species[1] | Environmental risk to native Great Britain species[2] |
|---|---|---|
| | • Bay barnacle *Amphibalanus improvisus*<br>• Bryozoan *Bugulina simplex*<br>• Bryozoan *Bugulina stolonifera*<br>• Carpet sea squirt *Didemnu vexillum*<br>• Colonial sea squirt *Aplidium cf. glabrum*<br>• Compass sea squirt *Asterocarpa humilis*<br>• Chain Tunicate *Botrylloides violaceus*<br>• Darwin's barnacle *Austrominius modestus*<br>• Devil's tongue weed *Grateloupia turuturu*<br>• Green sea fingers *Codium fragile fragile*<br>• Polychaete *Goniadella gracilis*<br>• Orange-striped anemone *Diadumene lineata*<br>• Orange-tipped sea squirt *Corella eumyota*<br>• Red ribbon bryozoan *Watersipora subatra*<br>• Tufty buff byozoan *Tricellaria inopinata*<br>• Trumpet tubeworm *Ficopotamus enigmaticus*<br>• Leathery sea squirt *Styela clava* | |

A species account has been provided for those with a high to medium risk:

- High Risk:
  - American Lobster: A large crustacean from the north-west Atlantic. Slightly larger than (but very similar to) the native lobster (GB NNSS, 2015). The species has been recorded in Solway, at Workington (Solway Firth Partnership, 2015).
  - Chinese mitten crab: The Chinese mitten crab measures up to 56 mm in carapace length. Its carapace has a square outline, tapering towards the front, and features four teeth on each side. The most prominent characteristic of this crab is the thick layer of hair covering its claws and legs. The species have been found to be distributed within the River Dee, Mersey, Ribble and at the mouth of the River Duddon (NBN Gateway, 2023).
  - Wakame*:* A large species of kelp native to Japan, which has a broad frond with fingered edges and a conspicuous midrib. The holdfast is compact and root-like, and the stipe above it bears many folded reproductive frills. Grows on hard substrates from low intertidal to approximately 18 m, tolerant of salinities as low as 20 (GB NNSS, 2019a). The species has been recorded in Liverpool Bay and is currently contained within Fleetwood Marina, located near Blackpool, however, it has increased in abundance in recent years (Hurst, 2016).
- Medium Risk:
  - Slipper Limpet: Shell is oval and up to 5 cm in length. The large shell opening has a shelf, extending half its length. Shell is smooth and white, cream, yellow or pinkish in colour with streaks or blotches of red or brown. The species is now distributed in Europe from Norway to the Mediterranean, with population explosions on the south and south-west England. Within Liverpool Bay, the species has been recorded along the north-west of Wales around Anglesey and at the mouth of the River Mersey (NBN Gateway, 2023).

- Japanese skeleton shrimp: An aggressive skeleton shrimp originally from northeast Asia, which is rapidly invading and has established populations in the North Sea, the West coast of Scotland and the Irish Sea (GB NNSS, 2012). The species has been recorded in Loch Ryan and can be found in harbours and marinas amongst fouling growth on boat hulls, ropes and nets where it can clog equipment and nets as well as outcompete native species (Hurst, 2016).
- Wireweed: A highly distinctive large olive-brown seaweed, often over 1m long. Its lateral branches hang like washing from a line when held out of the water. Wireweed competes with native seaweeds and sea grasses through rapid growth, shading and abrasion. It is a nuisance in harbours and shallow waters where it is a hazard to boating due to the entanglement of propellers (GB NNSS, 2019b). The species is distributed widely along the coasts of south and west England, Wales and West Scotland. It was first recorded in Scotland in Loch Ryan in 2004 and has since populated various areas further north up the west coast (Hurst, 2016).
- Pacific oyster: There are extensive beds of naturally recruited Pacific oysters in some southern estuaries of England and sparse settlements are known from the north coast of Wales near Conwy. Mature individuals were first recorded on the Galloway coast at Ravenshall in October 2012, Ross Bay in December 2012 and Balcary Bay in January 2013. A survey published in 2015 confirmed the Solway Firth to be an ideal habitat for the species although densities were low (Solway Firth Partnership, 2015).

Volume 3, Marine Biodiversity Technical Report (RPS Group, 2024) appendix I of the ES highlights the discovery of an INNS, the polychaete worm *Goniadella gracilis*, at the partially decommissioned station GS28 by Hamilton North (Figure 1.1).

The presence of INNS within and near to the Proposed Development area is considered to be of **Significant-Risk**.

Should any further INNS be recorded in the area prior to finalising the plan, these should be highlighted here, identifying the risk that each species represents to the UK's native species. Table 1.6 presents a summary of the results of Step 1.

**Table 1.6: Summary Of The Site Risk Of The Introduction And Spread Of INNS**

| Site factor effecting risk of INNS | Assessment Result | Risk of INNS |
|---|---|---|
| Environmental conditions affecting biosecurity | The influx of freshwater into Liverpool Bay, tidal currents and a higher proportion of sand fractions, with no rock, found throughout the Proposed Development are likely to reduce the likeliness of INNS being present within the area. Therefore, the environmental conditions of the site can be assessed as Low-Risk. | Low |
| Man-made Structures | The presence of existing hard structures within the Proposed Development, as well as the presence of Gwynt y Mor offshore wind farm located within the south-westernmost corner of the Proposed Development are likely to increase the potential for INNS to establish. Therefore, the presence of man-made structures is assessed as a Significant-Risk. | Significant |
| INNS within the Proposed Development | NBN data (2023) indicated no INNS are present within the Proposed Development area. However, within the wider area of the Proposed Development, Liverpool Bay is known to have INNS present within ports and harbours.<br>Additionally, volume 3, Marine Biodiversity Technical Report (RPS Group, 2024) appendix I of the ES highlights the discovery of an INNS, the polychaete worm *Goniadella gracilis*, at the partially decommissioned station GS28 by Hamilton North within the Proposed Development area. Therefore, the presence of this INNS is considered to be of Significant-Risk. | Significant |

Given the results of Step 1 indicate two areas where the risk of INNS is significant, the INNSMP should focus on reducing the risk of further introducing new INNS and consider how to prevent the spread of existing INNS to other sites.

### 1.5.2 Step 2: Understand how INNS may be introduced or spread through site activities

#### 1.5.2.1 Vessels and equipment to be used in the Proposed Development

Table 1.7 lists the vessels and equipment to be used for the Proposed Development with a 'risk' indicator for the potential to introduce or spread INNS. This risk assessment will be updated once the final project parameters have been confirmed and will be based on professional judgement, the final Proposed Development design, INNS present within the area (see Section 1.5.1), and available guidance.

The ES is based on the Proposed Development design parameters, which include the use of several vessels, planned infrastructure, such as cables and $CO_2$ injection, sentinel and monitoring wells, and the modification of existing installations (Figure 1.1). Additionally, there may be a requirement to use concrete mattresses and rock armour. These will be refined post-consent, such that the risk can be accurately assessed. As stated previously, this is a 'live' document and as such, if specific details of the Proposed Development undergo review or are changed, this document will be updated accordingly.

The results of Step 2 as presented in Table 4.2 indicate that the use of vessels in all phases of the Proposed Development presents a significant risk for the introduction of INNS. However, operational speeds of the vessels combined with the implementation of standard control measures to comply with relevant regulations such as MARPOL and those to manage ballast water will reduce the risk to low.

Man-made structures also present a significant risk to the introduction of INNS and given the identified presence of an INNS within the Proposed Development. Additional project specific control measures will be required to manage this risk.

**Table 1.7: Vessel, Foundation Types, And Substrates To Be Used In The Proposed Development**

| Name | Type | Details & Risk factors | Risk before control measures: Low/Significant | Assumptions and Standard Control Measures | Risk after control measures: Low/Significant |
|---|---|---|---|---|---|
| Vessels (Construction phase) | Various | • Vessel types and sizes to be used in the construction phase for the:<br>– Oil Platform and wells include: Main installation and support vessels, tug/anchor handlers, cargo barges, support vessels, survey vessels, pre-comm vessels, seabed preparation vessels and crew transfer vessels; and<br>– Cables and pipe include: cable lay installation & support, vessels, jack-up, multicat, working boat, support vessel (for trenching), dsv/lcv (for cable pull-in), survey vessel, seabed preparation vessel, crew transfer vessel, cable protection installation vessel and cable burial installation vessel.<br>• Indicative construction port:<br>– Port of Belfast Shipyard, Belfast, N.Ireland, UK (150 nm from the Proposed Development), and<br>– Arnish Point Yard, Isle of Lewis, Scotland, UK (380 nm from the Proposed Development), with the final decision still to be made. | Significant | Vessels will be slow moving during construction and are expected to come from the Port of Belfast, approximately 150 nm from the Proposed Development.<br>Vessels will be required to have an anti-fouling coating, inspection history complying with relevant regulations (MARPOL Regulations) and to manage ballast water.<br>Anti-fouling coating and adherence to the MARPOL regulations and ballast standards will reduce the risk of INNS being present on the hulls of vessels. | Low |
| Vessels (operation and maintenance) | Various | • Vessel types and sizes to be used in the operation and maintenance phase include a jack-up barge and a multi-purpose support vessel.<br>• The indicative operation and maintenance port is yet to be confirmed. | To be confirmed | Vessels will be required to have an anti-fouling coating and inspection history complying with relevant regulations (MARPOL Regulations). | To be confirmed |

| Name | Type | Details & Risk factors | Risk before control measures: Low/Significant | Assumptions and Standard Control Measures | Risk after control measures: Low/Significant |
|---|---|---|---|---|---|
| Vessels (Decommissioning phase) | Various | • Vessel types and sizes to be used in the decommissioning phase include decommissioning and support vessels, tug/anchor handlers, cargo barges, cable decommissioning and support vessels, survey vessels, and crew transfer vessels.<br>• Indicative decommissioning port:<br>– Port of Belfast Shipyard, Belfast, N.Ireland, UK (150 nm from the Proposed Development), and | Significant | Vessels will be slow moving when removing structures during decommissioning and are expected to come from the Port of Belfast, approximately 150 nm from the Proposed Development.<br>Vessels will be required to have an anti-fouling coating, inspection history complying with relevant regulations (MARPOL Regulations) and to manage ballast water.<br>Anti-fouling coating and adherence to the MARPOL regulations and ballast standards will reduce the risk of INNS being present on the hulls of vessels. | Low |
| New Infrastructure | • CCS platforms<br>• Topsides | • Infrastructure, pile jacket and topsides will be delivered via heavy lift vessel, crane or transport barge. | Low | The piles will be prefabricated at an onshore facility and delivered offshore by means of a transportation barge and are unlikely to come into contact with the water, (and therefore INNS), until installation. | Low |
| | • Pipeline | • A 595 m length of the pipeline is to be installed and laid on the seabed. This is likely to be transported via barge. | Low | The pipeline will be delivered offshore by means of a transportation barge and is unlikely to come into contact with the water, (and therefore INNS), until installation. | Low |
| | • Monitoring Wells | • Monitoring wells are to be drilled. | Low | INNS are unlikely to colonise the drilled wells. | Low |
| | • Cables | • Cables will be installed from onshore through to the connection point via the installation vessel. | Significant | Cables are to be installed throughout a wide range of environmental conditions and habitats, with vessels likely to have come from ports where INNNS may be present. There is therefore an increased risk of introducing an INNS along the cable. | Low |

| Name | Type | Details & Risk factors | Risk before control measures: Low/Significant | Assumptions and Standard Control Measures | Risk after control measures: Low/Significant |
|---|---|---|---|---|---|
| | | | | However, according to the Project Description cables are expected to be burried thereby mitigating any colonisation of INNS on the cable | |
| | • Concrete Mattresses/ Other External Cable Protection | • Concrete mattresses and other external cable protection will be installed at crossings of existing cables, and in areas where cable burial is not deemed feasible, or as a remedial secondary protection measure if the target cable depth of lowering cannot be achieved | Low | Concrete mattresses/ other external cable protection are to be delivered to the site via barge and will not come into contact with the water, (and therefore INNS), until installation. | Low |
| Repurposed infrastructure | • Repurposing of existing pipelines<br>• Redevelopment of reservoirs<br>• Recompletion of monitoring wells | • Existing infrastructure is to be repurposed for the Proposed Development. | Significant | Volume 3, Marine Biodiversity Technical Report (RPS Group, 2024)appendix I of the ES has reported that one specimen, the polychaete worm *Goniadella gracilis* was recorded at the partially decommissioned station GS28. | Significant |

### 1.5.3 Step 3: Significant site activities

Based on the results of Step 2, a list of the Proposed Development activities per phase, that may have a significant risk of introducing or spreading INNS is provided in Table 1.8. The assessment in Step 2 was derived from information provided in the Project Description and will be updated based on the final project design as explained in Step 2 (section 1.5.2), with these activities predicted to represent a significant risk of INNS introduction during the construction, operation and maintenance and decommissioning phases.

**Table 1.8: Site Activities Which Have A Significant Risk Of Introducing Or Spreading INNS**

| Phase | Activity Description |
|---|---|
| Construction | • Presence of existing man-made structures that may have INNS present. |
| Operation and Maintenance | • Presence of man-made structures that may have INNS present.<br>• Maintaining man-made structures and ancillary equipment that may have INNS present. |
| Decommissioning | • Removal of man-made structures and ancillary equipment that may have INNS present.<br>• Cleaning and disposal of biofouling from man-made structures and ancillary equipment. |

### 1.5.4 Step 4: Biosecurity control measures

This section provides information on site-specific risks and control measures associated with the Proposed Development.

#### 1.5.4.1 Presence/maintenance/ removal of existing man-made structures that may have INNS present

**Risk**

This may pose one of the greatest risks of INNS spreading associated with the Proposed Development. New or clean surfaces, such as vessels and infrastructure are typically the first colonisation sites for INNS due to their ability to settle and rapidly proliferate, replacing native populations (Huxel, 1999). Newly available hard surfaces (e.g. new platforms and auxiliary infrastructure) associated with the Proposed Development may be susceptible to colonisation by INNS found at the partially decommissioned station GS28 (near Hamilton North and Hamilton) in the first few weeks/months after installation (Bax *et al.*, 2003).

**Control measures**

Any man-made structure to be used for the Proposed Development should be of terrestrial origin (i.e. not coming from another marine environment) and inspected for INNS prior to placement in the marine environment. During maintenance, the structure should be inspected for any INNS present, and if detected, then actions should be followed as presented in Section 1.5.6.

It should be noted that the INNS *Goniadella gracilis* is a species of polychaete worm, these worms are unlikely to adhere themselves to structures but will be inhabiting the surrounding sediments of the station GS28. As the species does not adhere to structures, this is likely to decrease the risk of spreading the INNS to other areas. However, caution should be advised if dredging within the vicinity of GS28 is required.

### 1.5.4.2 Cleaning and disposal of biofouling from structures during operation and maintenance activities and decommissioning

#### Risk

During routine operations and maintenance activities (e.g. jet washing of marine growth from the splash zone, or component replacement where required), there is potential for any established INNS to be detached from subsea structures. Where there is an identified risk that these activities may lead to the spread of INNS in the marine environment, additional control measures may be required.

Following the removal of marine structures during the decommissioning phase, INNS, if present, may still be attached to the surface. Should the INNS be removed without due care and washed back into the marine environment surrounding the Proposed Development, these INNS may represent a risk of spreading to areas previously unaffected.

#### Control measures

Where there is an identified risk that operation and maintenance activities (e.g. periodic cleaning of infrastructures) may lead to the spread of INNS (e.g. if there is a high risk that INNS are present on infrastructure), control measures may be required to minimise the amount of material entering the marine environment.

Large volumes of material detached or removed from decommissioned subsea infrastructure should be prevented from re-entering the marine environment. The material should be taken away and properly disposed of onshore. Control measures taken in relation to the disposal of biofouling will be aligned with the relevant Port Authority 'Waste Management Plan'.

#### Biosecurity action

Prior to the installation of subsea structures or operation of new vessels to the Proposed Development, the Applicant and their contractors must include the following biosecurity clauses in any contract agreement:

- The contractor must submit a Biosecurity Risk Assessment to the Project Environmental Manager at least six weeks prior to installation/operations; and
- The contractor must ensure that all equipment, materials, machinery, Personal Protection Equipment (PPE) and vessels used are in a clean condition prior to their arrival on-site to minimise the risk of INNS introduction into the marine environment.

### 1.5.4.3 Additional biosecurity measures

The Proposed Development has been assessed as Significant in Step 1, therefore, using the precautionary approach, additional biosecurity measures have been presented.

### 1.5.4.4 Using vessels from outside of the Proposed Development

#### Risk

Using vessels from outside the Liverpool Bay area poses a significant risk of introducing INNS to the area (Minchin and Gollasch, 2010), especially vessels coming from areas of a similar marine environment. Information on the origin of the vessels to be used in all phases of the Proposed Development will be included within the INNSMP once the exact details and origins of vessels are specified following the appointment of construction contractors.

### Control measures

All vessels to be used for construction, operation and maintenance and decommissioning activities must follow the guidelines as directed by the 'Guidelines for the Control and Management of Ships' biofouling to minimize the transfer of invasive aquatic species'[3], and where applicable, to comply with the 'International Convention for the Control and Management of Ships' Ballast Water and Sediments'[4].

## 1.5.5 Step 5: Biosecurity surveillance, monitoring and reporting procedures

Table 1.9 outlines who is responsible for carrying out certain checks of INNS, where these checks are to be carried out and when. Note that these positions are indicative, and roles and responsibilities will be confirmed upon contract award.

**Table 1.9: Roles, Responsibilities, And Instructions For Staff, Contractors, And Site Users**

| Who | What | Where | When |
|---|---|---|---|
| Project Operations & Environment Manager - developers and contractors | • Oversee removal of flora and fauna from infrastructure, concrete mattress etc. and ancillary equipment, ensure material is properly disposed of and that no material is released into the water as per the relevant Port/Harbours 'Waste Management Plan'.<br>• Awareness of INNS, including identification guidance on the key risk species. If uncertainty arises, follow the contingency plan. | At Port | Beginning of works |
| Project Operations & Environment Manager or appropriate contractor | • Oversee installation and removal of infrastructure, concrete mattress etc. and ancillary equipment, checking for INNS or unknown organisms.<br>• For operations and maintenance, periodic checks should be carried out to ensure no growth/settlement of INNS, when possible.<br>• Be aware of any slow-moving or inactive craft and take steps to assess risk.<br>• Ensure a Check, Clean and Dry message is sent to any new developers or contractors.<br>• Where possible, collaborate with the relevant port/Harbours and other users of Liverpool Bay to raise INNS awareness. | At Port | Beginning of works |
| Developers and contractors | • Confirm the origin of the material used in infrastructure, concrete mattress etc. and ancillary equipment (i.e. terrestrial origin, not previously submerged in marine water).<br>• Encourage 'toolbox' talks on INNS prevention and monitoring. | N/A | Throughout works |
| Project Operations & Environment Manager - developers and contractors | • Through collaboration with the Regulators (including relevant stakeholders) will develop measures appropriate to the Proposed Development deployment specific to the site, nature, and duration of activities on a case-by-case basis. | N/A | Beginning of works |

[3] For more information, see: Biofouling (imo.org)

[4] For more information, see: Ballast Water Management (imo.org)

### 1.5.6 Step 6: Contingency plan

**Table 1.10: Contingency Plan In The Event Of Failure Of Prevention Of Inns Introduction**

| Action | Responsibility |
|---|---|
| **Stage One – Suspected arrival of high-alert species** | |
| Take photographs of the sample and collect the sample in a plastic bag. | Designated biosecurity officer, site manager, Contractor Environmental Manager or Client Environmental Manager (depending on the phase of the project), or any member of staff at the site of INNS discovery. |
| Check the organism against the identification sheet (see ID sheets » NNSS (nonnativespecies.org))<br><br>Report to Recording » NNSS (nonnativespecies.org) | Designated biosecurity officer, site manager, Contractor Environmental Manager or Client Environmental Manager (depending on the phase of the project), or any member of staff at the site of INNS discovery. |
| **Stage Two – Presence of high-alert species confirmed** | |
| Initiate immediate containment measures, including restricted vessel movements. | Designated biosecurity officer, site manager, Contractor Environmental Manager or Client Environmental Manager (depending on the phase of the project). |
| Carry out a wider survey of vessels and structures. | Designated biosecurity officer, and qualified ecologist. |
| **Stage Three – Eradication/employ long-term control measures** | |
| Seek advice from the GB Non-Native Species Secretariat on appropriate measures and actions for long-term control. | Designated biosecurity officer and Contractor Environmental Manager or Client Environmental Manager (depending on the phase of the project). |

### 1.5.7 Evaluation and review

#### 1.5.7.1 Location of biosecurity logbook

A biosecurity logbook will be kept (in electronic form) for the Proposed Development and will be made available for inspection and review as and when required.

#### 1.5.7.2 Plan review date

This plan will be updated prior to construction to include the final project design and include an updated risk assessment based on that final design. This will include all measures to manage INNS during the construction, phase as agreed with the relevant regulatory authorities.

The plan will be updated following the completion of construction and at the beginning of the operational and maintenance phase to ensure the plan is appropriate for the next phase of the development and the risks and activities associated with it. The plan will be updated at regular intervals during the operational and maintenance phase and prior to the decommissioning phase to ensure all measures are appropriate and any changes in the environment and risk of INNS (e.g. records of INNS being present on site) are reflected in the INNSMP, as agreed with the relevant regulatory authorities.

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## APPENDIX B – BREAK OUT MGMT PLAN

| | |
|---|---|
| **Project Title**<br>**Boskalis** | **AMS Project Number**<br>**J3130** |
| **Project Location**<br>**Liverpool Bay** | **Status**<br>**For Review** |
| **Document Title**<br>**Breakout Plan** | |
| **AMS Document Number**<br>**J3130-AMS -ZZZZZZ-PLN-AB-00007** | **Revision**<br>**B** |
| **Client Document Number**<br>**N/A** | **Date**<br>**29/08/2025** |

***** UNCONTROLLED WHEN PRINTED *****

| Approvals | | |
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| Michael Moore |  | 01/10/2025 |
| **Checked** | **Signed** | **Date** |
| Matt Waterson |  | 01/10/2025 |
| **Approved (Client)** | **Signed** | **Date** |
| | | |

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| Change Log | | |
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| **Revision** | **Location** | **Brief Description of Change** |
| A | All | Document Creation & inception into project |
| B | All | Revised following comments from Client |
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## Contents

# 1.0 Abbreviations

| Code | Description |
|---|---|
| AMS | AMS No Dig Ltd |
| HDD | Horizontal Directional Drilling |
| EMP | Environmental Management Plan |
| RAMS | Risk Assessment & Method Statement |
| SHEQ | Safety, Health, Environmental, Quality |
| COSHH | Control of Substances Hazardous to Health |
| HSE | Health & Safety Environment |
| HDPE | High Density Polyethylene |
| SDR | Standard Dimensional Ratio |
| CCTV | Closed Circuit Television |
| LOLER | Lifting Operations & Lifting Equipment Regulations |
| CSCS | Construction Skills Certificate Scheme |
| CPCS | Construction Plant Competence Scheme |
| PPE | Personal Protective Equipment |
| SDS | Material Safety Data Sheet |
| OD | Outside Diameter |
| PE | Polyethylene |
| POWRA | Point of Work Risk Assessment |
| ECOW | Environmental Clerk of Works |
| LCM | Loss Circulation Material |

# 2.0 References

For the purposes of traceability this document shall be read in conjunction with the following reference documentation.

| Document Reference | Document Title | Old Document Number |
|---|---|---|
| 10xxxxxxxxxxxxxx | PoA Cable Route and Foreshore Works CEMP | N/A |
| | | |
| | | |
| | | |
| | | |

# 3.0 Introduction

During the normal operation of the directional drilling process, drill fluid ("mud") is pumped into the borehole to facilitate the transfer/flow of ground cuttings back to the entry (and exit) pit and also to provide physical support to the drilled borehole. As the length of the drilled bore increases then additionally the internal fluid pressure will also increase to ensure a continuous flow of fluid is maintained back to the entry pit. Modelling of the bore internal fluid pressure is carried out during detailed design and will highlight "potential risk areas" along the drill path where fluid loss may occur based on the calculated internal bore fluid pressure vs vertical ground pressure imparted on the bore due to the overlying strata. Whilst the model is an extremely useful tool, local variations in ground strength, compaction, ground water and sub-surface voids or fissures cannot be accounted for in the model and therefore unplanned surface fluid loss may occur. This document details the preventative measures to minimise this risk as well as the procedure to be implemented should loss of drill fluid to the surface occur.

# 4.0 Project Overview

Boskalis is undertaking the Liverpool Bay Carbon Capture and Storage (CCS) Transport and Storage Project, a key infrastructure initiative supporting the UK's decarbonisation objectives. As part of this project, Boskalis is seeking to appoint a competent contractor to deliver the Horizontal Directional Drilling (HDD) landfall work package.

The scope of works includes the installation of a single polyethylene (PE) cable duct using HDD techniques. The drill will extend approximately 500 metres, commencing from an onshore entry point and terminating at the beach front exit point. AMS will utilise proven HDD technology and a streamlined methodology to minimise environmental impact, reduce disruption to the surrounding area, and ensure precise alignment of the installed duct.


***Fig 1: HDD Drill Location – Talacre, North Wales***

# 5.0 Scope of Works

The scope of works involves the Monitoring, Identification, Containment, Reporting and Clean-up of any inadvertent breakout drilling fluid that occurs on land during the HDD process involving:

- Stopping all HDD works
- Sand dune & beach access and egress
- Movement of sandbags and/or hay bales
- Containment of the drilling fluid.
- Clean up and removal of drilling fluid.
- Removal of material from site.
- Assessment of any remediation works if necessary, reinstated as found.

**ADD SNAPSHOT OF LATEST PROFILE DRAWING HERE**

***Fig 2: Document number – document title***
***Drawing for Reference Only***

In summary, the details of the HDD duct is as follows:

| Pipe Information | Details |
|---|---|
| **No. of drills** | 1 |
| **Pipe Diameter** | 315mm TBC |
| **Pipe Length** | 500m |
| **Pipe Type** | Polyethylene cable duct |

# 6.0 Commitment to the Environment

Principles and objectives for this project are documented in the Boskalis HSE Plan, the Environmental Management Plan, and the Project Quality Plan. Commitment to SHEQ is instilled throughout the AMS organisation by competent trained managers and operators who are accountable for themselves and those around them.

The following procedures detail the actions to be taken in the event of surface fluid loss with particular consideration to the existing local flora, fauna and wildlife prevalent in the area.

# 7.0 Drilling Fluid Principals

The breakout of drilling fluid (Mud) occurs when fluid pathways are developed between the borehole and surface, due to the hydraulic pressure of drill fluid within the annulus of the bore exceeding the confining formation strength of the surrounding geology.

Stakeholders should be reminded that drilling fluids are freshwater suspensions of inert clay particles. Although slippery, they are environmentally benign and in fact can be utilised to improve the water retention of poor-quality soils. Control Of Substances Hazardous to Health, (COSHH), and Material Safety Data Sheets, (SDS), are kept on site for all products involved in the drilling operation.

During the drilling of the pilot hole entry and exit curves, when the depth of cover, formation consolidation and confining strength are at a minimum, breakout is most likely. The design of the drill is carried out to minimise the risk of the breakout in high risk areas, ensuring sufficient depth of cover.

A Breakout can also travel to surface via existing pathways, e.g., previously installed utilities, foundation piles and existing boreholes. Any Site Investigation bores sunk must wherever possible be offset to the proposed drill line and sealed up on completion, boreholes directly on the drill line will increase the risk of breakouts during drilling operations.

Once punch out at exit point has been achieved, the annular pressure within the bore is relieved. Breakout during hole opening and pipe pulling operations is therefore much less likely to occur.

In the event that a drill fluid break out does not self-seal & drilling mud continues to break out at the surface then a loss circulation material (LCM) shall be prepared. LCM material is designed to seal fissures in the formation and is added to the drilling mud as required. The LCM comes in many forms such as cork or manufactured inert polymers PAC. These additives will be pumped into the system and can stem the flow and in certain conditions seal the flow completely.

# 8.0 The Stages of Drilling Fluid Breakout Management

1. **Prevention (Proactive)**

   A breakout occurs when annular fluid pressures exceed formation fracture pressures. Annular fluid pressures are minimised by constant monitoring of the drilling fluid parameters. The Drill Fluids Operator will monitor drill fluid density, viscosity, and solids content on an ongoing basis, to ensure that the fluid does not increase in viscosity, requiring additional pressure to maintain mobility.

   The Drill Rig Operator will monitor the drill fluid pressures, volumes, viscosities and densities of mud being pumped through the bore. Any deviation in pump pressure experienced by the Drill Operator will be investigated immediately by the driller to prevent the risk of pressure build up within the annulus.

   In some circumstances, dependant on the drilling equipment being used, the pilot drill Bottom Hole Assembly (BHA) may will be fitted with a down hole pressure monitor to measure pressure in the annulus between the drill and the bore wall this will give an early indication of pressure build up in the hole and will provide the drill operator the best chance of preventing a breakout. In the event of a pressure monitor being fitted this would be only be during the Pilot Drilling.

   Cleaning runs and tripping out the drill line will enable any excess down hole cuttings to be remove which will reduce the down hole pressure reducing the risk of a breakout. This method should also be used in the first instance when trying to seal a bore before the use of LCM’s detailed in the containment section of this document.

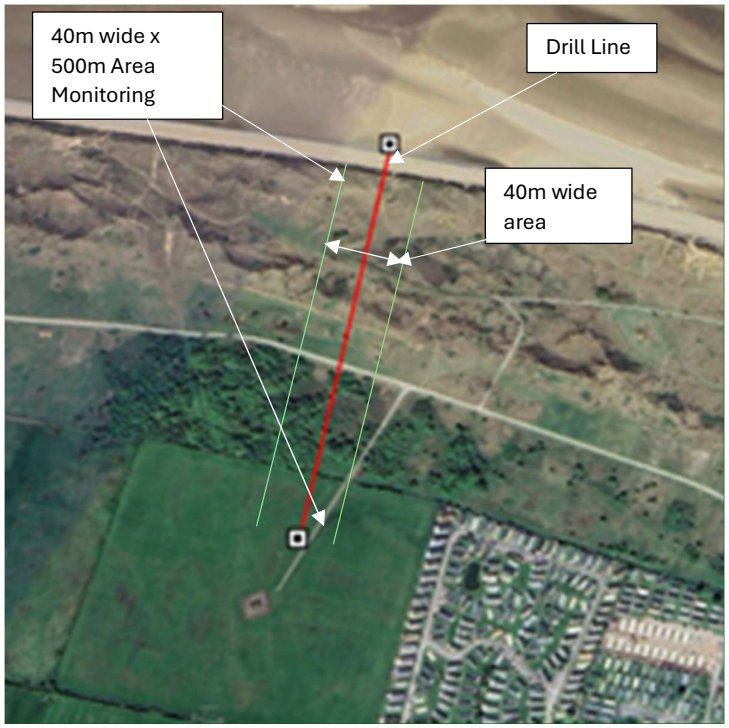
   More information is detailed in Section 10 of this document.

## 2. Monitoring

It should be recognised that in most cases the extent of a drilling fluid breakout is limited to the time it takes to turn off the mud pump which will instantly stop the flow of drilling mud. In extreme cases mud may continue to escape from the bore due to the static head pressure exceeding the overburden pressure of the formation that is being drilled but this event is rare. The drill (rig hand) is responsible for monitoring the flow of mud at both the drill entry and exit points. This is a continuous operation and is carried out by two-way radio communication. The mud technician is responsible for monitoring mud volumes within the mud system.

In addition, monitoring by way the an Operative of walking the Drill Line will take place during day and night shifts where 24 hour working allows (the frequency is dependent on the location, environment, and potential risks, where the ground is likely to have a high potential of breakouts). It is proposed that a 40m x 500m channel including Drill Line will be monitored.

The Drill Line will be identified by the placement of posts with a identification tape, this will make it identifiable the operatives carrying out the monitoring walk. In the event of drill fluid breakout, the operation will be stopped, and the Boskalis will be informed as soon as possible.




More information is detailed in Section 10 of this document.

## 3. Containment

This section identifies possible leakage paths that have been identified and includes both those potential paths that emanate at surface and those that discharge elsewhere. This list is not exhaustive and should be populated further if additional potential leakage paths are identified on site. Haybales and/or sandbags, vacuum bowsers, and positive displacement pumps will be stored in the works compound ready for deployment to the breakout location.

In the event of a break out within the Warren / Dune area, we propose will use the defined pathways to attempt to get as close as possible to the affected area. Small mobile plant will be used to transport the haybales and sandbags to and from the site compound. Where possible hand tools will be used to minimise the use of larger equipment.

A sand bag bund may be constructed around the breakout area and drilling fluid recovered from the bund by using either a vacuum tanker or by using a positive displacement pump to pump from the bund directly back the mud pit or by manually sweeping the fluid into a receptor for disposal. (Barrow, dumper, pickup) it may be necessary to excavate a small catchment pit to contain the breakout. In the event of any walkway being obstructed by pump hoses this will be mitigated by the use of ramps to enable walkers, cyclists and wheelchair users access over the pipe. All mobile plant will use plant nappies and spill kits to protect the ground from any fluid leaks. Passers by will be prevented access to the breakout area initially by a Marshall whilst barriers are put in place.

More information is detailed in Section 10 of this document.

As a last resort, If loss of drilling fluid has occurred and re-conditioning the bore fails to seal the fissure loss circulation material (LCM) will be introduced into the bore. This material will help seal any leakage to the bore. Following the introduction of LCM material regular visual and circulating fluid volume checks will be carried out to ensure loss pathways have been sealed. When adding LCM additives the volume of drilling fluid in the drill line this will be a calculated in accordance with manufacturers guidance, volume and pump rates. Drilling Fluid split during LCM deployment will be contained.

## 4. Clean Up

The Clean-up operation is a very important part of the process, the following tasks must be completed.

1. Contaminated Sandbags/Haybales are removed and all other items will be disposed of in accordance with the waste management plan..
2. Removal of any signage and barriers erected.
3. Making safe any area that has been affected because of access and egress.
4. Returning the breakout area and route to an as found state, back filling holes with local material, cleaning pathways and roads to ensure any residual mess is a minimum.
5. As part of the report the location is to have the GPS coordinates this can be done using the mobile app at the location.
6. Photographs to be taken of the breakout prior to cleaning up.
7. Photographs to be taken of the breakout after cleaning up.(in app)
8. Photographs to be taken of the route to the beach prior and after

9. ECoW monitoring must be carried out to determine the recovery of the habitats following the pre-works habitat condition survey.
10. Report created and submitted via **My Compliance.**
11. The area will be made accessible for the public following the Clean-up process

# 9.0 Plant & Equipment

The following plant and equipment will be ready and available when required:

- Tractor, trailer and Vacuum tanker
- Small pumps suitable for handling slurry
- Tracked Dumper or Similar
- Sandbags or Hay bales
- Shovels
- Barriers, tape and signage to create a safe working area and to keep the area protected

# 10.0 Breakout Procedure

## 10.1 Identify and Reporting

All incidents must be reported as soon as is practicable to the AMS Trenchless Project/Site Manager and HSE Manager, in addition to this the Boskalis Management and HSE Team and their Environmental representation. Boskalis will inform local Stakeholders and landowners as appropriate.

In the event of a spill/ breakout, the priority is to **STOP** inform drill operator to shut down pumps to stop the breakout **Contain** to prevent it from continuing to spill if possible and to prevent the substance from spreading further, if safe to do so recover fluid.

**STOP-CONTAIN-NOTIFY**

Inform your supervisor/manager immediately and warn fellow employees working nearby to either evacuate the area or keep well clear ensuring a safe cordon zone is established. If necessary, evacuate the site.

Any incident will be reported as soon as practicably possible to Boskalis.

Photos of the areas will be taken, and the incident will be reported to the SHEQ Manager via the web-based reporting system My Compliance.

***Fig 3: My Compliance QR Code***

All employees will be encouraged to install the My Compliance (My Incident) app but this is not essential as just scanning the QR Code here will open the portal.

You will then be taken through a series of reporting questions
enabling a full report to be generated for AMS SHEQ team to respond to.

## 10.2 Access to the Warren and Dunes

The area that would be at the most is risk of drilling fluid break out is the lower Warren area. This is due to the depth of cover would be at its lowest point during HDD drilling process. In the event of a drilling fluid break out in this area and the dunes, all necessary plant and equipment that is required to access will only use the defined pathways. Two banks persons will be present, taking care that the area is fully respected and any members of the public are kept safe from the manoeuvring plant and equipment.


## 10.3 Minor and Major Breakout Response

**Minor Breakout:**

In the event of the discovery of a drilling fluid break out, AMS will contain the spillage by the use of hay bales and or sand bags creating a barrier or bund to contain the lost fluids, taking in to consideration the nature of the warren and dune area access and egress of the area. it may be necessary to excavate a small catchment pit to contain the breakout. Containment of the works will be demarcated by using wooden posts and or pegs and orange netting which will be managed by operatives.

AMS will attempt to transport by small mobile plant or similar to move all the sandbags and bales as near as possible to the affected area by using the defined pathways, then manhandled to the affected area. Where the flow of slurry is continuous the use of a small pump may be required for immediate control to pump the slurry to a point whereas a tractor

and vacuum bowser could be used remove the slurry from the area to the recycling plant. If the break out ceases to continue and no further evidence is found, the area will be cleaned and all remains of slurry, bales and sandbags removed and disposed of. The area will be left in a satisfactory condition. Plant and equipment will not drive over vegetation, plants or bushes.

**Major Breakout or Continuous:**

For immediate control we would implement the use of a pump if the breakout in continuous. Once again hay bales and or sandbags will be used an immediate method of containment

The hay bales and/or sandbags will be lifted by two persons when required and loaded into a dumper, the items would be transported as near as possible to the affected area using the defined pathways.

Containment of the works will be demarcated by using wooden posts and or pegs and orange netting which will be managed by operatives.

With permissions in place from Boskalis, it may be necessary to excavate a small catchment pit to contain the breakout. the team will then lay a pump suction pipe and discharge hose across the warren using pathways to minimise any environmental disruption. This pump will be used to remove the slurry from the affected area to a to a point whereas a tractor and vacuum bowser could be used remove the slurry from the area to the recycling plant.

This would be a managed operation to ensure that there is no risk to the health, safety and environmental welfare of the area and members of the public.

If the break out ceases to continue and no further evidence of additional slurry is found, the area will be cleaned and all remains of slurry, bales and sandbags removed and disposed of. The recovery of the haybales and/or sandbags will be handballed back to the dumper along with any sand requiring to be disposed and disposed of in an appropriate manner and the area will be left in a satisfactory condition.

**Points to Note:**

- In advance of commencing Drilling Operations both the Day and Night team will walk this route, this will be deemed as a drill and captured accordingly on a Drill report form.
- This will allow all members of the Team to familiarise the route.
- The key personnel will be:
    - Supervisor
    - Marshals / Banks persons
    - Mobile plant operator
- Barrier Management is placed at relevant points along the route and around the breakout point to prevent members of the public from entering
- Any members of the public in the immediate/surrounding vicinity are politely asked to leave the area.

- Either the Project Manager or Night Site Manager will liaise with members of the public if required.
- Highlight any issues that the driver needs to consider.
- Move any obstructions (that can be moved by hand)
- Whilst the break-out is being cleaned/removed the operatives will respectfully direct members of the public that approach and ask questions to the Project Manager.
- **CALL AN ALL STOP** if any danger exists to the public, or any wildlife is identified. The above will be captured and defined in the daily/pre shift TBT.

# 11.0 Health & Safety

**AMS**

All site personnel shall have attended a project induction which will be organised by the AMS responsible manager. All site personnel will have completed the CITB health & safety test and will be trained and assessed as competent in their area of responsibility. All operators hold valid CSCS and CPCS cards or suitable equivalent as required.

**PPE**

AMS shall supply the following PPE (free of charge) to all AMS sites staff and operatives. All operatives to use only AMS issued/approved PPE, the following must be worn during this operation:

| PPE Equipment | Safety Standard |
|---|---|
| Hard Hat | EN 397 |
| Coveralls | FR21 |
| Safety Footwear | EN20345 S3 |
| Reflective Clothing | EN 20471 |
| Safety Glasses | EN166:2001 1F |
| Suitable Gloves | EN 388 |

The standard of the PPE required to undertake the task is detailed in the site-specific risk assessment.

All site personnel shall comply with any additional PPE requirements that have been identified by permit or on-site risk assessment.

**First Aid**

- First aid facilities will be always available on-site.
- First aiders are displayed on the HSE board.
- Mental Health First Aider
- First Aid kits,
- Eyewash station
- Defibrillator

**Risk Assessments**

A risk assessment has been prepared for the scope of work covered by this method statement. It is the responsibility of the project manager/supervisor to ensure that all personnel are briefed and have signed off, about risks and signed onto the risk assessment, hazards, and precautions to be taken. The project manager/supervisor should also ensure that adequate supervision is always available on-site to achieve full compliance. Night and lone working will be covered in the HDD construction risk assessment method statement.

**COSHH**

As per the Project COSHH assessment register and SDS which are available in the site file and via the My Compliance software. All COSHH assessments will be provided to Boskalis in advance of the HDD works commencing.

## 12.0 Briefing Register

| Method Statement Briefing Register | |
|---|---|
| Date and Time of Briefing | |
| Location | |
| Name of Person Conducting Briefing | |

| The purpose of signing this register is to confirm that you have received a briefing in relation to this method statement and that you fully understand its contents. | | |
|---|---|---|
| Name | Signature | Date |
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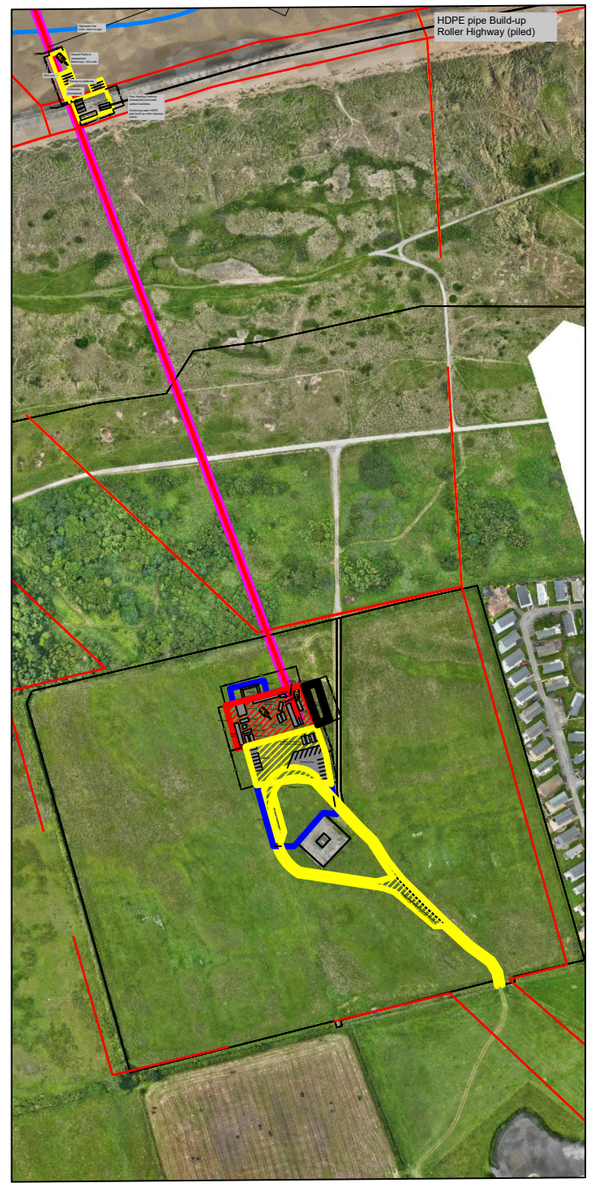
## APPENDIX C – SITE PLAN WARREN FARM – HDD WORKS


| REV. | DD/MM/YY | REVISION REASON | CKD. ORG. | CKD. DISP. | CKD. INT. | APP. OPS. | APP. PM. |
|---|---|---|---|---|---|---|---|
| A | 30/09/25 | First Issue | TDKN | | | N/A | GLIS |

DEVELOPMENT: Liverpool Bay CCS

PROJECT:

SUBJECT: Warren Farm Site – HDD Works (INDICATIVE ONLY)

CLIENT: ENI / LB CCS

**BOSKALIS SUBSEA CABLES**
P.O.BOX 43, 3350 AA PAPENDRECHT – E-MAIL: ROYAL@BOSKALIS.COM



| FORMAT | PROJECTION | CLIENT DRAWING NO. | REV. |
|---|---|---|---|
| A3 | | – | – |
| SCALE | | BOSKALIS DRAWING NO. | SHEET / REV. |
| 1:100 | | 20250923 WARREN FARM HDD | Warren Farm |

## APPENDIX D – SITE PLAN BEACH – HDD WORKS

Redline Boundary

Redline Boundary

Highwater Line

KP 0.5

HDPE pipe Build-up Roller Highway (piled)

End of Roller Highway Sheave block redirecting winch wire back to platform

138

248

120

Highwater line (excl. storm surge)

10

Raised Platform (sheetpiled) Machinery / drill rods

15

HDD exit

Ramps to platforms

Cofferdam (sheetpiled)

20

3

Welfare

Welfare

Stores

Pipe Weld Tent

Winch

Pipe Storage

15

25

Pipe Welding Platform (sheetpiled) and small welfare faciltities

Continuing east: HDPE pipe build up roller highway (piled)

| | | | | | | | |
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| REV. | DD/MM/YY | REVISION REASON | CKD. ORG. | CKD. DISP. | CKD. INT. | APP. OPS. | APP. PM. |

DEVELOPMENT: Liverpool Bay CCS

PROJECT:

SUBJECT: Beach Site – HDD works (INDICATIVE ONLY)

CLIENT: ENI / LB CCS

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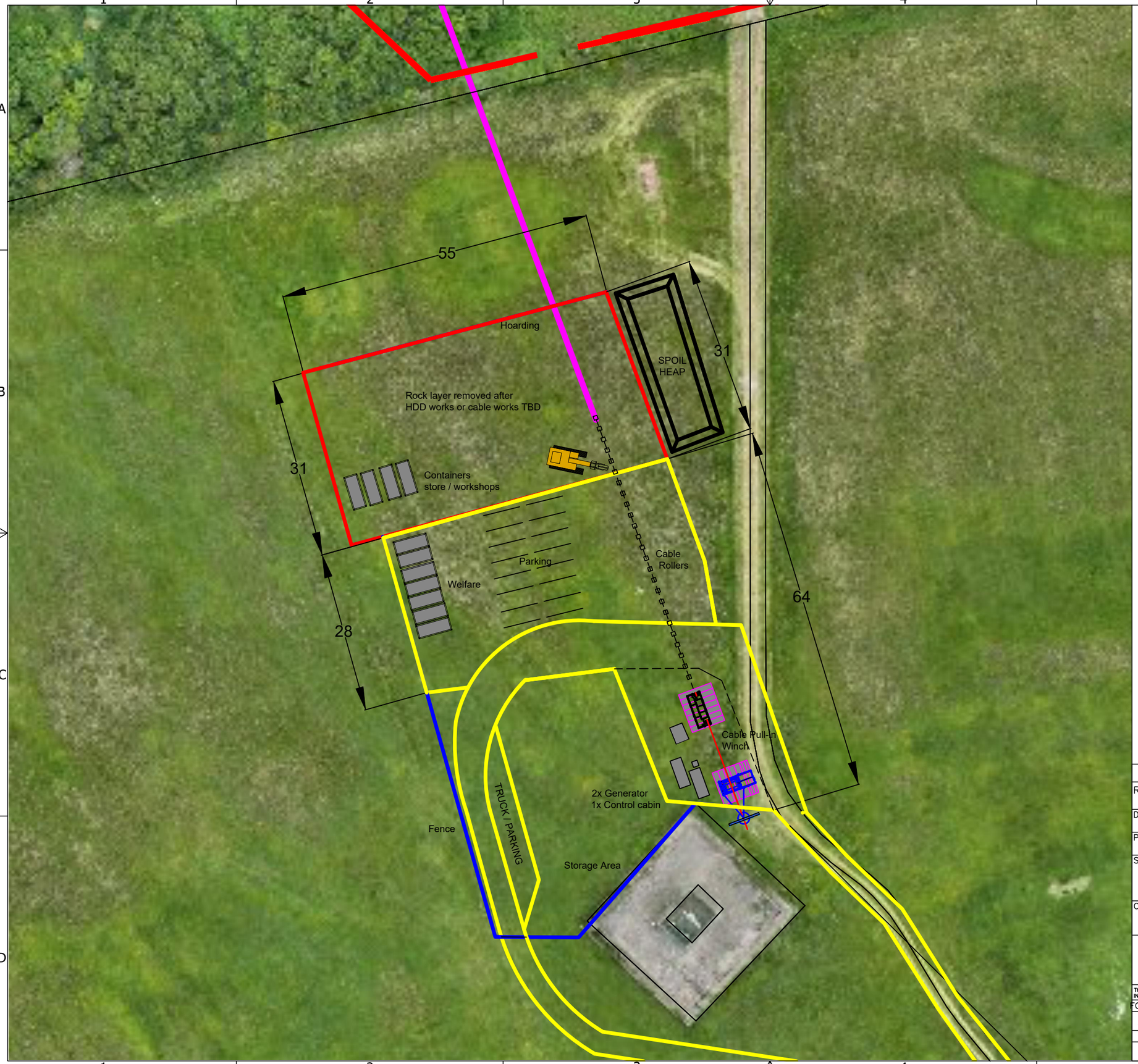
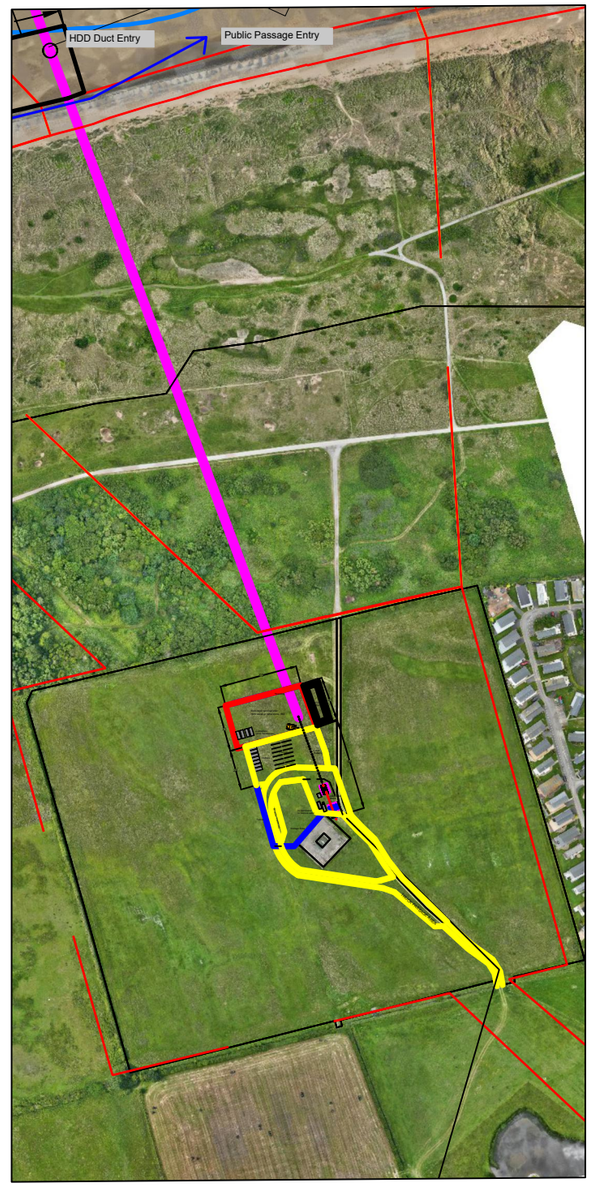
| SCALE | | BOSKALIS DRAWING NO. | SHEET / REV. |
| 1:100 | 20250923 WARREN FARM HDD Beach HDD | | 1 A |

## APPENDIX E – SITE PLAN WARREN FARM – CABLE WORKS

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|---|---|---|---|---|---|---|---|
| A | 30/09/25 | First Issue | TDKN | | | N/A | GLIS |

DEVELOPMENT: Liverpool Bay CCS

PROJECT:

SUBJECT: Warren Farm Site – Cable Works (INDICATIVE ONLY)

CLIENT: ENI / LB CCS

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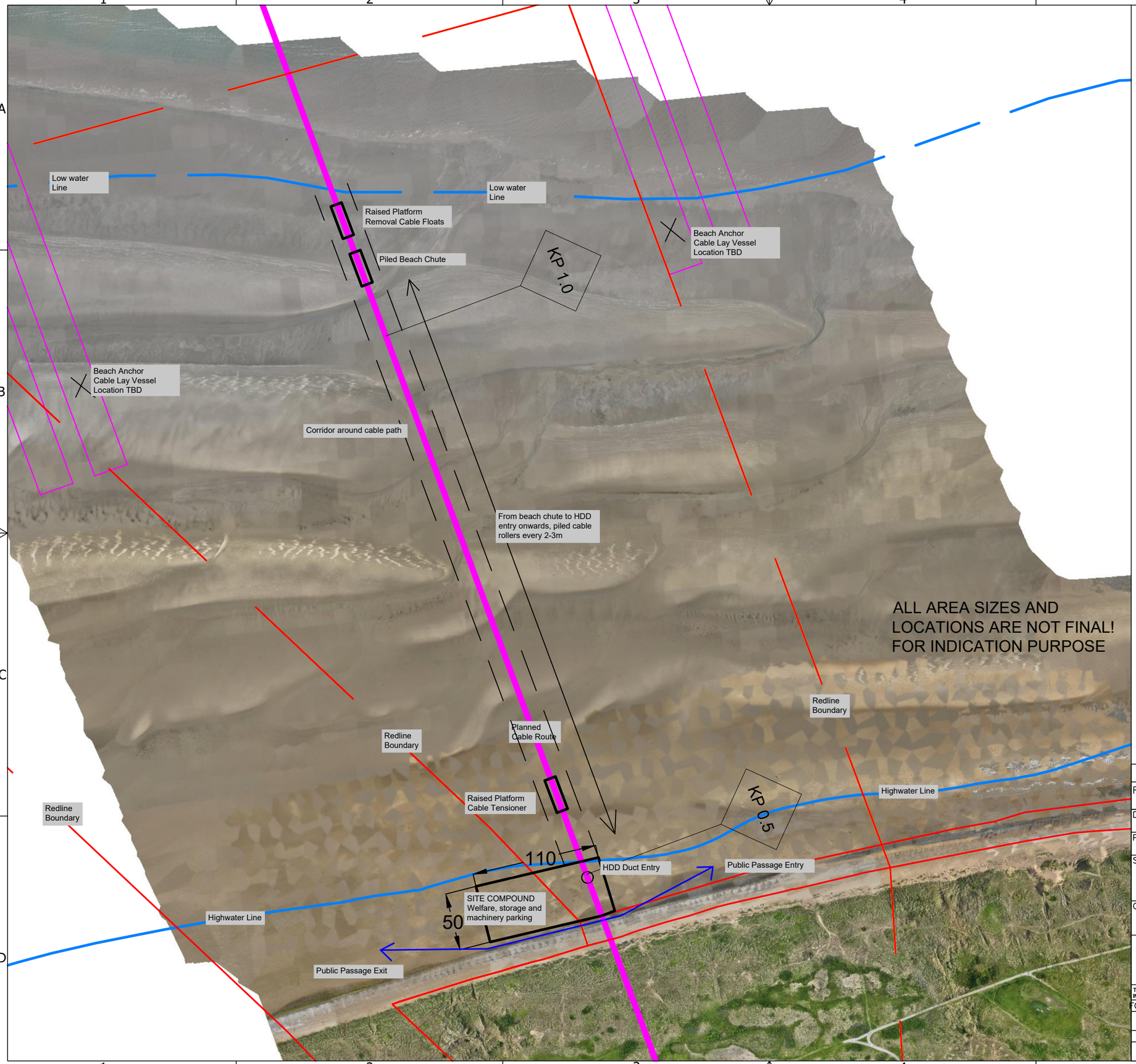
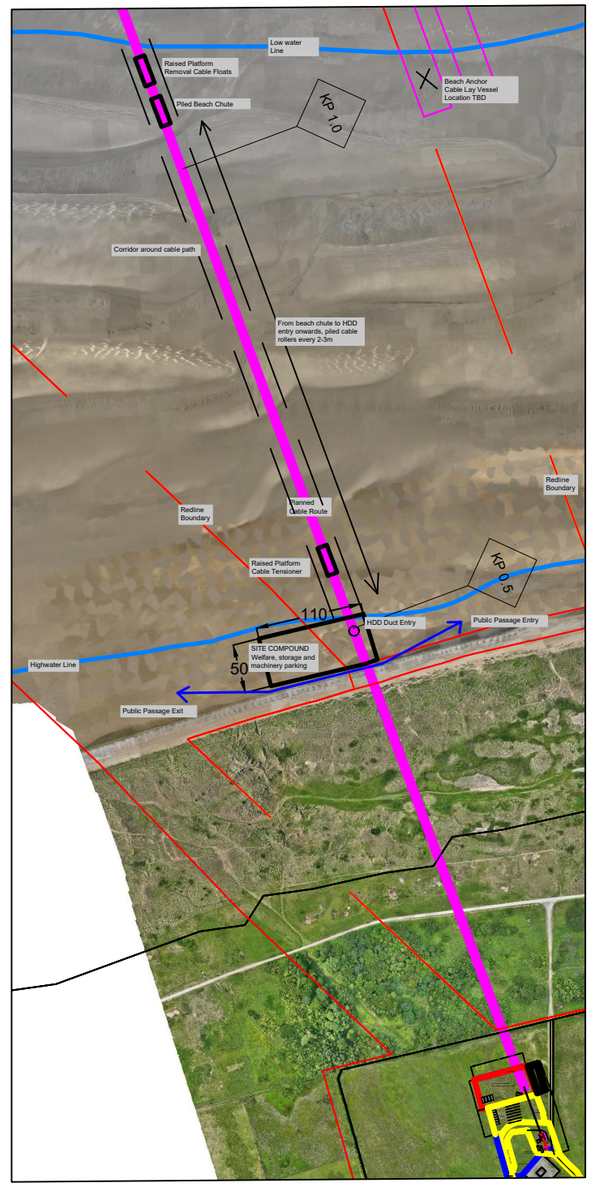
| SCALE | | BOSKALIS DRAWING NO. | SHEET / REV. |
| 1:100 | 20250923 WARREN FARM CABLE | | Warren Cable / A |

## APPENDIX F – SITE PLAN BEACH – CABLE WORKS

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| REV. | DD/MM/YY | REVISION REASON | CKD. ORG. | CKD. DISP. | CKD. INT. | APP. OPS. | APP. PM. |

DEVELOPMENT: Liverpool Bay CCS

PROJECT:

SUBJECT: Beach Site – Cable Works (INDICATIVE ONLY)

CLIENT: ENI / LB CCS

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| SCALE | | BOSKALIS DRAWING NO. | SHEET | REV. |
| 1:100 | | 20250923 WARREN FARM CABLE Beach Cable | 1 | A |