Orsted Onshore Ireland Midco Limited

Proposed Oatfield Wind Farm

Construction Environmental Management Plan

604569

DECEMBER 2023

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1 INTRODUCTION

1.1 Introduction

RSK Ireland Ltd. has been commissioned by Orsted (the Client) on behalf of Orsted Onshore Ireland Midco Limited (the Developer/s) to prepare this Construction Environmental Management Plan (CEMP) for the proposed Oatfield Wind Farm (the Proposed Development) in Co. Clare in support of the Planning Application.

This CEMP should be read in conjunction with the EIAR and NIS for the Development.

The CEMP is intended to form the basis of providing information on the management and methodologies at the site in relation to:

- Construction of the Development,
- Operation of the Development and
- Decommissioning of the Development.

With the implementation of the design and the mitigation measures proposed in the EIAR, any potential environmental impacts can be appropriately managed and mitigated, thus ensuring that there will be no likely significant environmental effects from the development.

This CEMP is a live document and should be treated as such. It will be updated to include any planning conditions and recommendations of the Planning Authority. It will be continuously reviewed and updated during the construction phase of the development.

Reviews can be triggered by the following events:

- Changes in the relevant legislation which could impact on the mitigation requirements of the construction phase.
- Where non-compliance with mitigation arises which require an update of the CEMP.
- Where issues arise as a result of site auditing for environmental compliance.
- Where complaints are received that necessitate a change in work practices that should be reflected in the CEMP.

Updated copies are to be provided to the Planning Authority within one week of updating.

1.2 Scope

This CEMP co-ordinates the mitigation recommendations in the EIAR chapters and details the mitigation measures within the EIAR chapters. The CEMP identifies the key environmental and construction contract constraints which the Contractor must adhere to. Multiple environmental receptors are present in the surrounding area.

This CEMP will be expanded and updated by the appointed construction Contractors prior to construction works commencing as some items can only be finalised with input from them when they have been appointed.

The Project is also currently at planning stage. The CEMP will also be updated to reflect any granted planning permissions and conditions.

The revised document will contain the site-specific control measures that will be applied by the Contractors and where relevant their sub-contractors during the construction stages of each element of the proposal.

The CEMP allows for the inclusion of any additional constraints applied from planning conditions to be included in updates. As such it should be considered a live document which will be constantly updated during the construction phase. The aims of the CEMP will be to;

- Ensure construction works and activities are completed in accordance with design, mitigation and best practice approach presented in the EIAR and any associated planning documentation;
- Ensure construction works and activities are completed in accordance with all planning conditions for the development and that the CEMP is updated as required;
- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure construction works and activities have no adverse effect on the integrity of any European Site;
- Ensure that construction traffic to and from the site is strictly managed to avoid unnecessary traffic movements;
- Identify a dedicated person on site to liaise with the Public regarding any concerns that they may have in relation to the site activities;
- Adopt a sustainable approach to construction; and,
- Provide adequate environmental training and awareness for all Project personnel.

A copy of the CEMP will be provided to each specific Contractor working on behalf of the client. A copy will be maintained on site for reference by the entire workforce. It will be accessible to all site personnel, subcontractors and representatives of the relevant enforcement authority.

The CEMP will be a key construction contract document, which will ensure that the mitigation measures, which are considered necessary to protect the environment are implemented.

Suitably qualified and experienced Environmental / Ecological Clerk of Works (ECoW) will be appointed to provide ecological and environmental advice during construction. The ECoW will monitor construction to ensure compliance with the CEMP and help to reduce risks and delays.

Any breaches of the CEMP will be reported to the appointed Project Manager who will have the authority to stop construction works.

1.3 Document Structure

This CEMP is structured as follows:

- Section 1 provides an introduction, with scope of the CEMP;
- Section 2 describes the site and project;
- Section 3 : summary of environmental setting;
- Section 4: objectives of the CEMP
- Section 5: Construction Activities
- Section 6: environmental policies and legal requirements;
- Section 7: environmental management implementation
- Section 8 Environmental management of site activities
- Section 9 Monitoring and environmental clerk
- Section 10: Communication
- Section 11: environmental training and awareness
- Section 12: emergency preparedness and response
- Section 13: compliance and auditing.

2 SITE AND DEVELOPMENT DESCRIPTION

2.1 Site Location and Plan

The site of the Proposed Development is located in the Oatfield and Gortacullin areas. At the nearest point, the Proposed Development site is approximately 1.3km to the South of Broadford, 4.7km to the East of Sixmilebridge, 7.6km North of Ardnacrusha, 9.2km North of Limerick, and 19.7km South of Ennis.

The Proposed Development site boundary (which is the planning boundary) includes:

- Two distinct areas containing the wind farm infrastructure, including turbines and on-site substation. Each distinct area is referred to as the Western DA and the Eastern DA (comprising principally of conifer plantation, transitional woodland scrub, mixed forest, pastures, agricultural lands, and peat lands.
- An IPP connection route from the Eastern DA to the 110kV substation located in the Western DA. The IPP cables will be installed within the body of the local public road network and public access trackway on approach to the Western DA. The overall length of this interconnecting IPP cable route is ca. 10.6km.
- Electrical energy generated from the wind farm will be exported to the national grid via double circuit underground grid connection cables to the proposed 110kV loop-in masts at Ballycar North, County Clare, where it will connect to the existing overhead 110kV line. Two options for the interconnection with the OHL are proposed.
    - The first is a loop-in to the existing Ardnacrusha – Ennis 110kV OHL at Ballycar North (ca. 3.83km cable length) and the second is a loop-in to the existing Ardnacrusha – Drumline 110kV OHL, also at Ballycar North (ca. 4.16km cable length).
    - Once the 110kV double circuit export cable leaves the Proposed Development site, the grid connection infrastructure will be installed within the body of the public road network along the route until it reaches third party lands where the loop-in towers will be located, beneath the existing OHL in the townland of Ballycar North.
- An area of land take required for accommodation works along the proposed turbine delivery route from Foynes Port to the Proposed Development Areas site (see Section 5.2.8.4 of **Chapter 5: Description of the Proposed Development for further details**).

The location of the Eastern and Western DA, including the layout of the proposed development is presented in **Figure 2.1**.

Existing land use in the area comprises coniferous forest, mixed forest, transitional woodland scrub, pastures, agricultural lands, and peatlands. Details of the land use type associated with the Proposed Development is included in **Figure 2.2** below.

Figure 2.1: Location of the Eastern and Western PDA showing IPP cable route

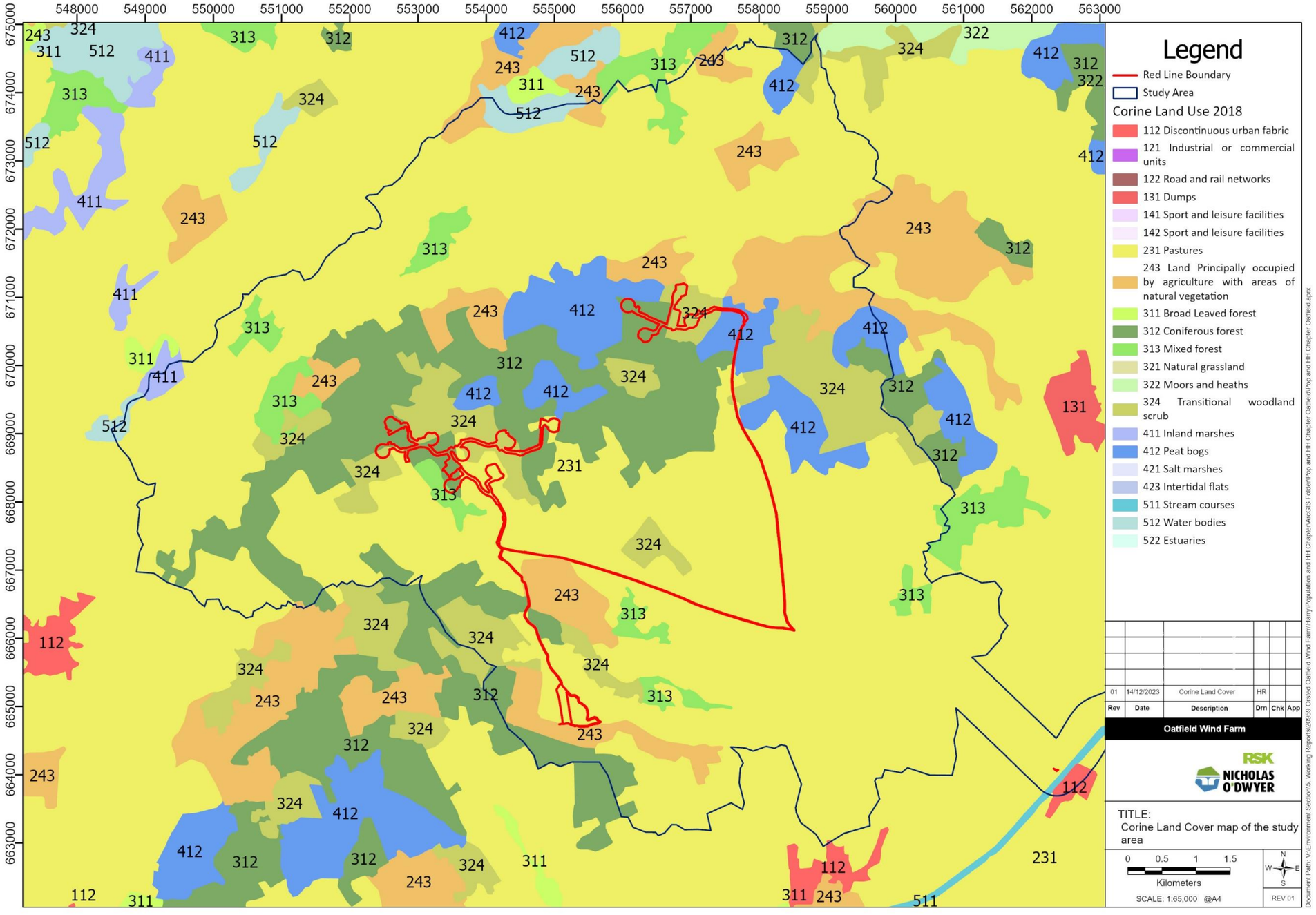

Figure 2.2 Corine land cover map of the proposed development area

2.2 Description of the Proposed Development

The Proposed Development comprises:

- 11 no. three-blade wind turbines with an overall ground to blade tip height range of 176.5m to 180m, a rotor diameter range of 133m to 150m and a hub height range of 105m to 110m;
- Construction of associated reinforced concrete foundations, crane pad hard-standing areas and associated plant/switching gear;
- Construction of new permanent, internal site tracks and upgrading of existing tracks and associated drainage infrastructure including a clear-span bridge (circa 10m length), concrete culverts and the installation of an on-site Sustainable Drainage System (SuDS);
- 2 no. temporary spoil storage areas (one in the western DA and one in the eastern DA;
- Erection of 1 no. permanent meteorological mast in the western development area with a height of 100 m above existing ground level;
- All associated internal, underground electrical and communications cabling connecting the wind turbines to an on-site substation located in the western DA;
- Provision of underground interconnecting 33kV IPP cabling and underground cable joint bays circa. every 750-1,000m for circa. 10.6km (joining eastern and western DAs) within the public road network including the R471;
- Provision of 1 no. 110kV onsite substation and parking in the western DA (Townland of Oatfield), along with associated control and switchgear;
- All works associated with the connection of the wind farm to the national electricity grid, which will be via a loop-in 110kV underground cable connection in the townland of Ballycar North, with 2 no. new 16m steel lattice end masts & associated overhead line (OHL) electrical infrastructure, located at the interface with the existing 110kV OHL. Two tie-in options to the existing overhead 110kV lines are proposed as follows:
    - Option A (loop-in to Ardnacrusha to Ennis 110kV OHL via 3.83km of double circuit underground cables and joint bays every 700 m from the onsite 110kV substation to two new 16m steel lattice loop-in masts located in the townland of Ballycar North.
    - Option B (loop-in to Ardnacrusha to Drumline 110kV OHL via 4.16km of double circuit underground cables and joint bays every 700 m from the onsite 110kV substation to two new 16m steel lattice loop-in masts located in the townland of Ballycar North.
- 2 nos. temporary construction compounds, including offices/meeting rooms, parking and transformer;

- 10 no. individual site access points and tracks to turbines, on-site sub-station, met mast, temporary spoil storage & temporary construction compound areas from the local road network/public trackway running north of the R471;
- Forest & tree felling to facilitate construction and operation of the proposed development;
- Temporary works to accommodate turbine delivery route (TDR) in the townland of Knockbrack Lower;
- All associated site development works including Construction, Operation and Decommissioning stage site-lighting, fencing and signage.

2.2.1 Removal of Forestry and Replant Lands

The construction of the Proposed Development will require the clear-felling of commercial conifer plantation and replanting in accordance with the licensing requirements of the Forest Service of the Department of Agriculture, Food and the Marine. A total of ca. 54 hectares of conifer forest plantation will be felled to facilitate the Proposed Development.

The felling will be the subject of a felling licence application to the Forest Service prior to construction as per the Forest Service's policy on granting felling licenses for wind farm developments. The Forest Service Policy requires that a copy of the planning permission for the wind farm be submitted with a felling license application. Therefore, the felling license cannot be applied for until planning permission is received for the Proposed Development. Felling will be carried only upon receipt of the appropriate permits and will be undertaken by a licenced felling contractor.

Replacement replanting of forestry in Ireland is subject to license in compliance with the Forestry Act 2014 as amended. The consent for such replanting is covered by the Forestry Regulations 2017 (S.I. No. 191 of 2017). The associated afforestation of alternative lands equivalent in area to those lands being permanently clear felled is also subject to licensing ('afforestation licensing').

The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing. In light of the foregoing and for the purposes of the Proposed Development, the developer commits that the location of any replanting (alternative afforestation) associated with the Proposed Development will be greater than 10km from the wind farm site and also outside any potential hydrological pathways of connectivity i.e. outside the catchment within which the proposed development is located. In addition, the developer commits to not commencing works until both felling and afforestation licences are in place and this ensures the afforested lands are identified, assessed and licensed appropriately by the relevant consenting authority.

2.2.2 Turbine Delivery Route

Large components associated with the wind farm construction will be transported to site via the identified Turbine Delivery Route (TDR).

The options initially considered for the turbine delivery route from Foynes Port to the Proposed Development site were assessed as part of an abnormal loads assessment. This is detailed in the Turbine Delivery Route Report which is provided in **Appendix 16.5** of **EIAR Chapter 16 Traffic and Transport** (see also **Chapter 4 Project Need and**

Alternatives Considered). A preferred route was selected for further assessment within the EIAR.

The RSK project team have assessed the selected preferred route for pinch points where temporary accommodating works may be required (e.g., cutting back vegetation, installing temporary road surfaces, removing fencing, signs, and street furniture, etc.) for the delivery of turbine components.

The selected route (see Figure 2.3) crosses the Shannon River at Killaloe - Ballina and will utilise the new Killaloe Bypass (see Figure 2.4), which includes a new bridge crossing of the River Shannon and an upgrade of the existing R494 regional road from Ballina to the N7 at Birdhill. The bypass is currently under construction and is scheduled for completion in 2025. This route optimises the balance between using appropriate road infrastructure i.e., national roads, motorways, regional roads, and some local roads.

Along the route, tree and hedgerow trimming will also be required and these will only be carried out at the appropriate time of the year and in accordance with any licencing requirements.

One land take requirement along this route has been identified at the turn from R463 to the R471 in County Clare (for which planning permission is being applied for), see Figure 2.5. This will involve the temporary loss of agricultural lands and some hedgerow.

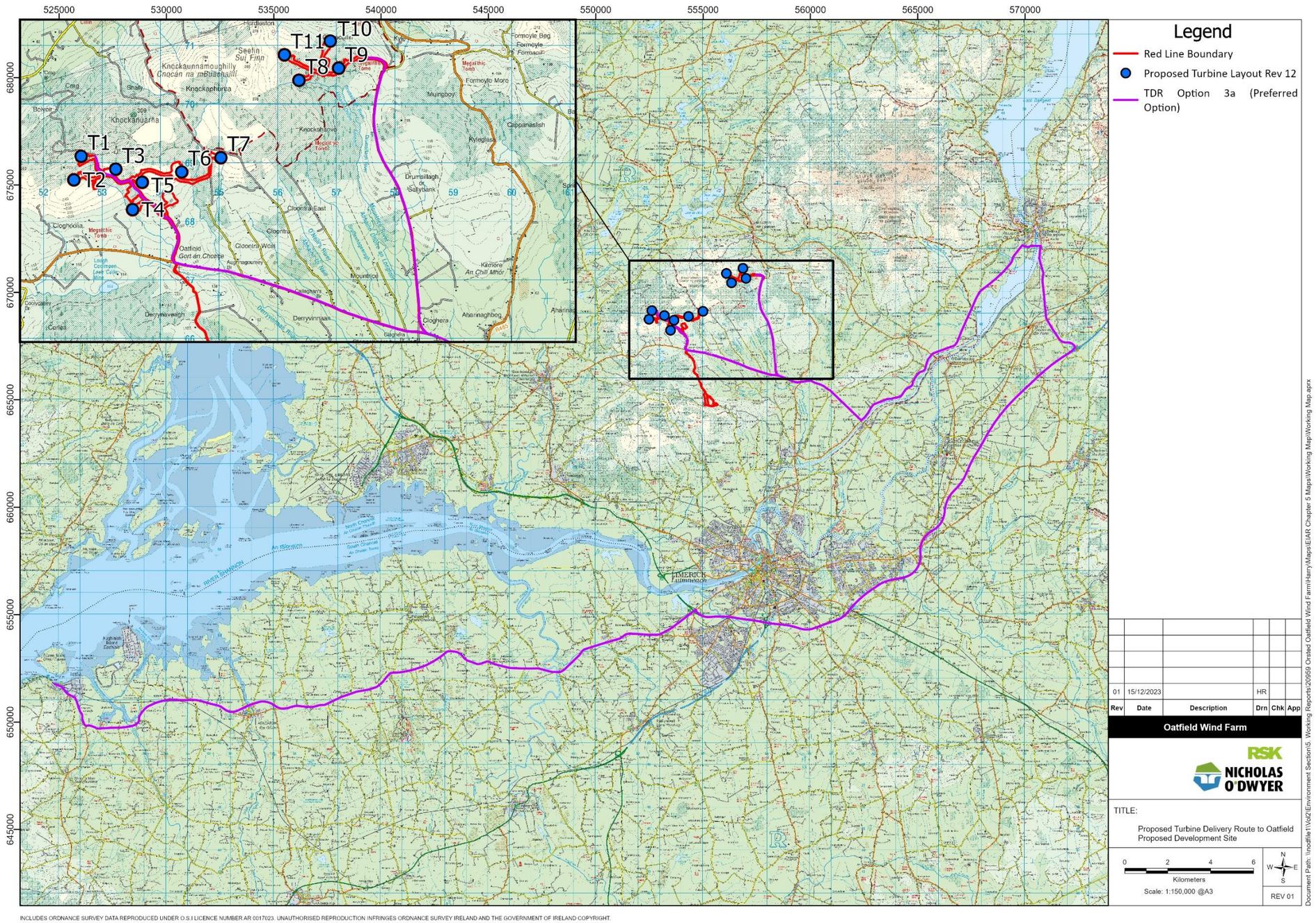

Figure 2.3: Proposed Turbine Delivery Route to Proposed Development Site

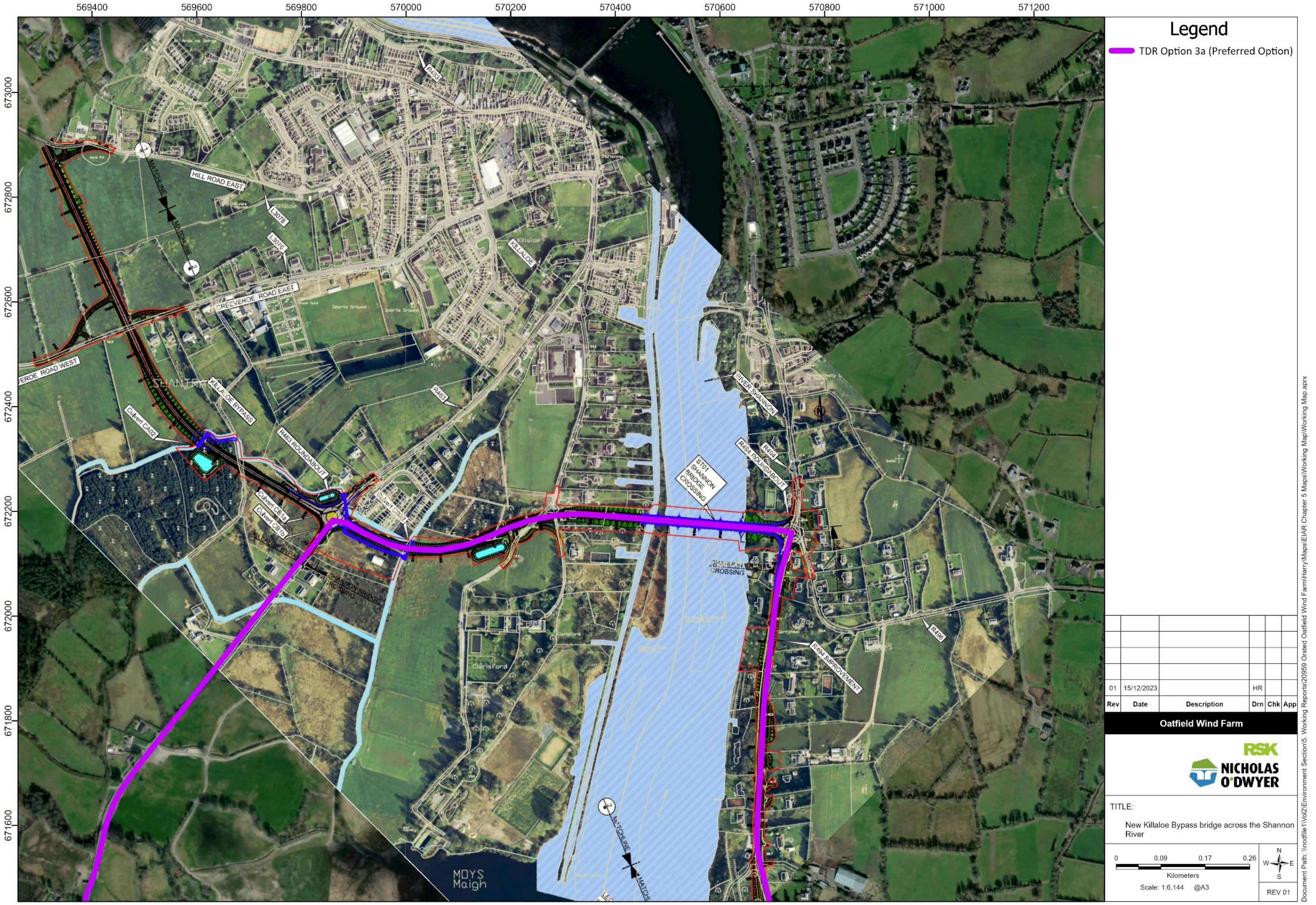

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Figure 2.4: New Killaloe Bypass bridge across the Shannon River

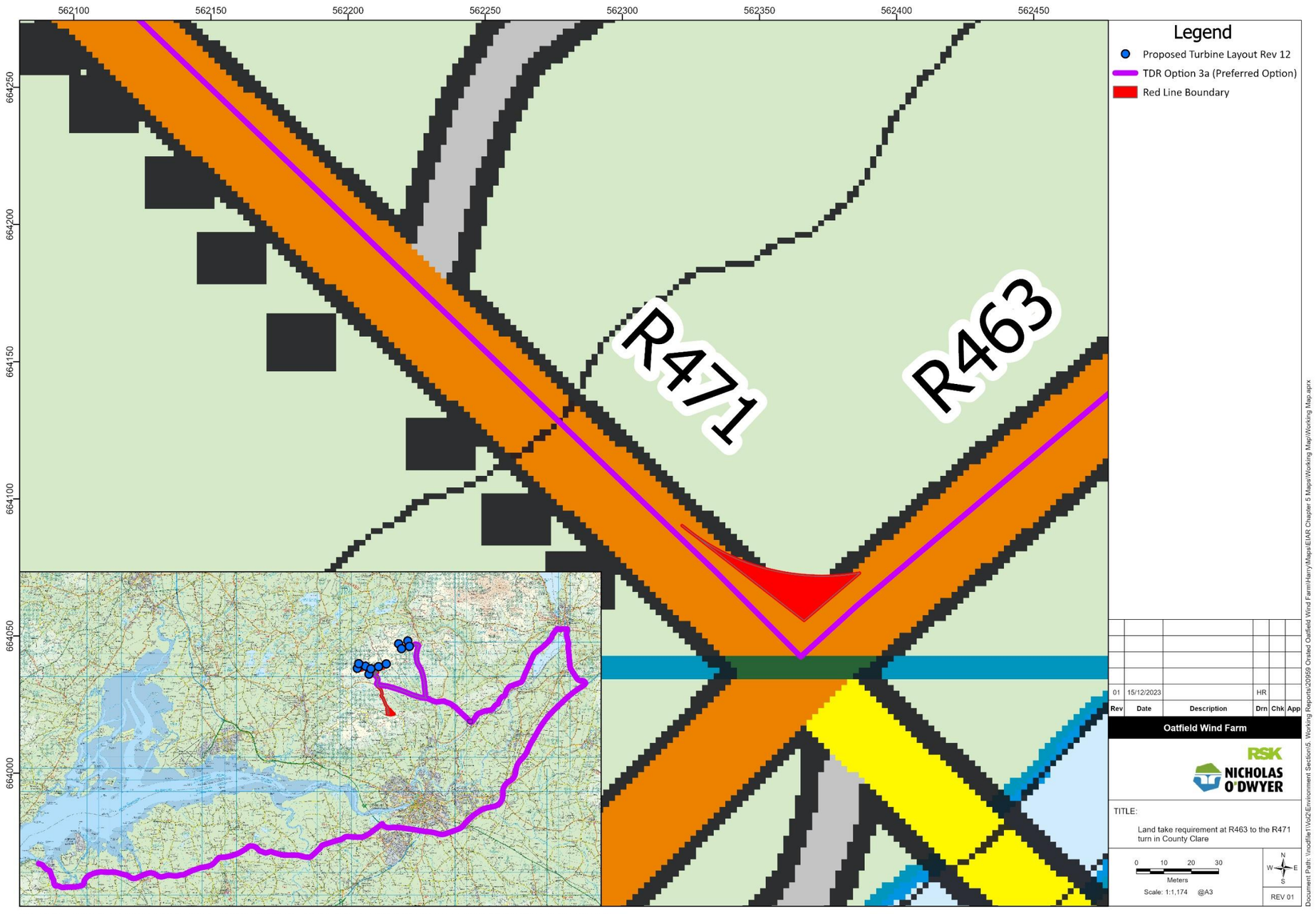


Figure 2.5: Land take requirement at R463 to the R471 turn in County Clare

The TDR Option 3a route to site is as follows:

- Loads will depart Foynes Port and travel West-East via the N69 for approximately 30km until it joins the N18;
- Loads will travel west along the N18 for approximately before continuing onto the M7;
- Loads will continue east on the M7 exiting at the junction with the R494 at Coolderry;
- Loads will continue to travel north to Ballina/Killaloe north on the R494 before crossing the Shannon on the new Killaloe by-pass bridge scheduled for completion in 2025, turning south onto the R463;
- Loads will continue south on the R463 turning northwest on the R471 at Cloonlara and then along two unnamed roads to the proposed site entrances.

Accommodation works required for each turbine delivery route have been identified and are provided in **Chapter 16, Appendix 16.5 Table 2**.

All temporary accommodation works associated with the Project shall be fully reinstated following the construction stage. Overhead utilities and obstructions will require removal at several locations to provide adequate overhead clearance. The removal of overhead utilities will involve temporary disconnections. Such works will be carried out by the utility providers in advance of turbine delivery to site.

A pre-condition survey will be carried out on all public roads that will be used in connection with the development to record the condition of the public roads in advance of construction commencing. A postconstruction survey will also be carried out after the works are completed.

All roads will be reinstated in a timely manner upon completion of the construction works.

Letter drops will be carried out to notify members of the public living near the proposed work locations to advise them of any particular upcoming traffic related matters.

Clear signage relating to the development, both temporary and permanent, will be provided for accessing the site. The entrances to the site will be secured when the site is not in use. When necessary, a flagman/ banksman will be utilised to assist traffic movements at the site entrance or in other areas as required.

Turbine delivery will require the transportation of abnormal loads. This will be undertaken at off-peak times under agreement with the local authority and An Garda Síochána.

5.2.8.5 Construction materials delivery route

Haulage to the site will consist of transporting other turbine components (e.g., turbine towers, nacelles, hubs) as well as general construction materials such as steel reinforcement, stone and concrete, cables, and other construction materials and electrical components. These will be brought into the site using the local roads in the region.

Construction haul routes have been assessed with respect to safety of all road users. Road safety improvement measures during construction stage may include tree trimming, signage and the construction of temporary passing bays in consultation with Clare County Roads Authority. The traffic management measures proposed for the Proposed

Development are outlined in a Construction Traffic Management Plan (CTMP) provided in **Appendix 5.2 of EIAR Chapter 5: Project Description.**

2.2.3 Grid Connection Route

The Proposed Development will be connected into either the existing Ardnacrusha to Ennis 110kV OHL (Option A) or the existing Ardnacrusha to Drumline 110kV OHL, Option B), via an underground 110kV double circuit underground cable to loop-in masts at the townland of Ballycar North. Both options are included for planning purposes and have been assessed in the EIAR.

The UGC works will require a double circuit which entails that two trenches in parallel are required for the entire length of the cable route with a minimum separation distance of 2000mm required between each circuit.

2.2.4 Project Programme

A procurement process will commence upon full planning approval to appoint a competent and experienced Contractor for the proposed works at the Site. It is estimated that the Proposed Development construction will take approximately 18 - 24 months to complete. The Development proposed timeline is set out in Figure 2.6.

The Contractor, once appointed, will develop a detailed construction work programme including plans to minimise risks to construction workers and local residents from dust, noise and vibration and to watercourses from pollution during each phase of the Development.

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Mobilisation and site setup																		
Site Clearance, Tree Felling and Fencing																		
Internal Access Tracks and Drainage																		
Turbine Hard Standings																		
Turbine / Metmast Foundation																		
Onsite Substation																		
On-site Cable Installation																		
Grid Route cable works (off site section only)																		
Turbine / Metmast Installation																		
Energisation, Commissioning & Testing																		
Biodiversity Enhancement																		
Landscaping, Fencing, Reinstatement, Demobilisation																		

Figure 2.6 Expected construction programme

3 SUMMARY OF ENVIRONMENTAL SITE SETTING

3.1 Local Hydrology

All references to Hydrology and Hydrogeology figures which are not presented in the text of this CEMP document can be found in **Appendix 9.6 of EIAR Chapter 9: Hydrology and Hydrogeology**.

Surface water networks associated with particular turbine locations are presented in **EIAR Chapter 9: Hydrology and Hydrogeology**, the Surface Water Flow Chart in Figure 9.3 and in the FRA Appendix 9.1.

The Oatfield Wind Farm Development is situated within the Lower Shannon Catchment (Code:25; Area 1041.26km2) and Shannon Estuary North (ID: 27; Area: 1,651.27km2). The Grid Connection Route 'Loopin1' is situated solely in the Lower Shannon Catchment. The Turbine Delivery Route is situated in the Lower Shannon Catchment (Code:25; Area 1041.26km2) and Shannon Estuary South Code:24; 2033.96 km2).

Surface water runoff associated with the wind farm site drains into two sub catchments (five river sub basins), nine no. rivers (the rivers are the Broadford River, Owenogarney River, Gourna River, Mountrice River and Blackwater (Clare) and two Loughs (the loughs are the Duin CE and Castle CE) (Figure 9.4a and Figure 9.5a):

- Sub Catchment: Shannon [Lower]_SC_100, River Sub Basins: Mountrice_010, Blackwater [Clare]_010 and Owenogarney_030
- Sub Catchment: Owenogarney_SC_010; River Sub Basins: Broadford_030 and Gourna_010

The Grid Connection Route drains into one sub catchment and river sub basins, or seven no. rivers (Figure 9.4b and Figure 9.5b):

- Sub Catchment: Shannon [Lower]_SC_100;
- River Sub Basin: Blackwater (Clare)_010, Blackwater (Clare)_020, Shannon (Lower)_060, Ballynaclogh_010.

The Turbine Delivery Route 'Foynes' drains into ten sub catchments and twenty- eight river sub basins (Figure 9.4c and Figure 9.5c):

- Sub Catchment: Owenogarney_SC_010; River Sub Basin: Broadford_030
- Sub Catchment: Shannon [Lower]_SC_100; River Sub Basins: Shannon (Lower)_060, Blackwater (Clare)_020, Glenomra Wood Stream_010, Blackwater (Clare)_010, Mountrice_010
- Sub Catchment: Shannon [Lower]_SC_080; River Sub Basins: Kilmastulla_050, Shannon (Lower)_050, Ardcloony_010, Bridgetown (Clare)_010
- Sub Catchment: Kileengariff_SC_010; River Sub Basin: Ballyard_020, Ballyyard_SC_010

- Sub Catchment: Shannon [Lower]_SC_090; River Sub Basins: Shannon (Lower)_060, Mulkear (Limerick)_050
- Sub Catchment: Ballynaclogh_SC_010; River Sub Basins: Barnakyle_020, Ballynaclogh_010
- Sub Catchment: Greanagh_SC_010;River Sub Basins: Tobermurry_010, Tonlegee_010
- Sub Catchment: Deel[Newcastlewest]_SC_050; River Sub Basins: Deegerty_020, Deegerty_010, Dromlohan_010
- Sub Catchment: Deel[Newcastlewest]_SC_040; River Sub Basin: Deel (Newcastlewest)_140
- Sub Catchment: Shanagolden[Stream]_SC_010; River Sub Basins: Foynes_010, Shanagolden Stream_010, Dooncaha Stream_010, Ahacronane_020, Glenbane West Stream_010, Lismakeery Stream_010

3.2 Site Drainage

All references to Hydrology and Hydrogeology figures which are not presented in the text of this CEMP document can be found in **Appendix 9.6 of EIAR Chapter 9: Hydrology and Hydrogeology**.

3.2.1 Existing drainage features

The site is characterised by a relatively extensive network of non-mapped natural and artificial drainage channels. The existing surface water runoff is contained within natural and artificial drainage channels that include stream and river waterbodies, drainage ditches, and other minor natural and artificial manmade drainage features.

Drainage channels identified during desk study assessment and during site surveys are presented in Figure 3.1 to 3.5.

As noted in EIAR **Chapter 9 Hydrology and Hydrogeology,** historical maps were reviewed as part of the desktop assessment.

Drainage channels are mapped using four categories:

1. Historically Mapped Surface Water (Not mapped by EPA/WFD);
2. Forestry Drainage;
3. Inferred Drainage; and
4. Minor Drainage.

3.2.2 Drainage design principles

Constructed drainage will be provided to manage runoff from tracks, hardstanding areas, turbine bases, and storage areas for excavated materials. These will minimise the potential for silt runoff during construction works and during the operational phase. The Proposed Development will adopt a surface water management plan and site drainage design using the principles of Sustainable Drainage, promoting on-site retention of flows and the use of buffers and other silt removal techniques. All drainage-related mitigation measures will form part of a robust Sustainable Drainage System (SuDS) on the site.

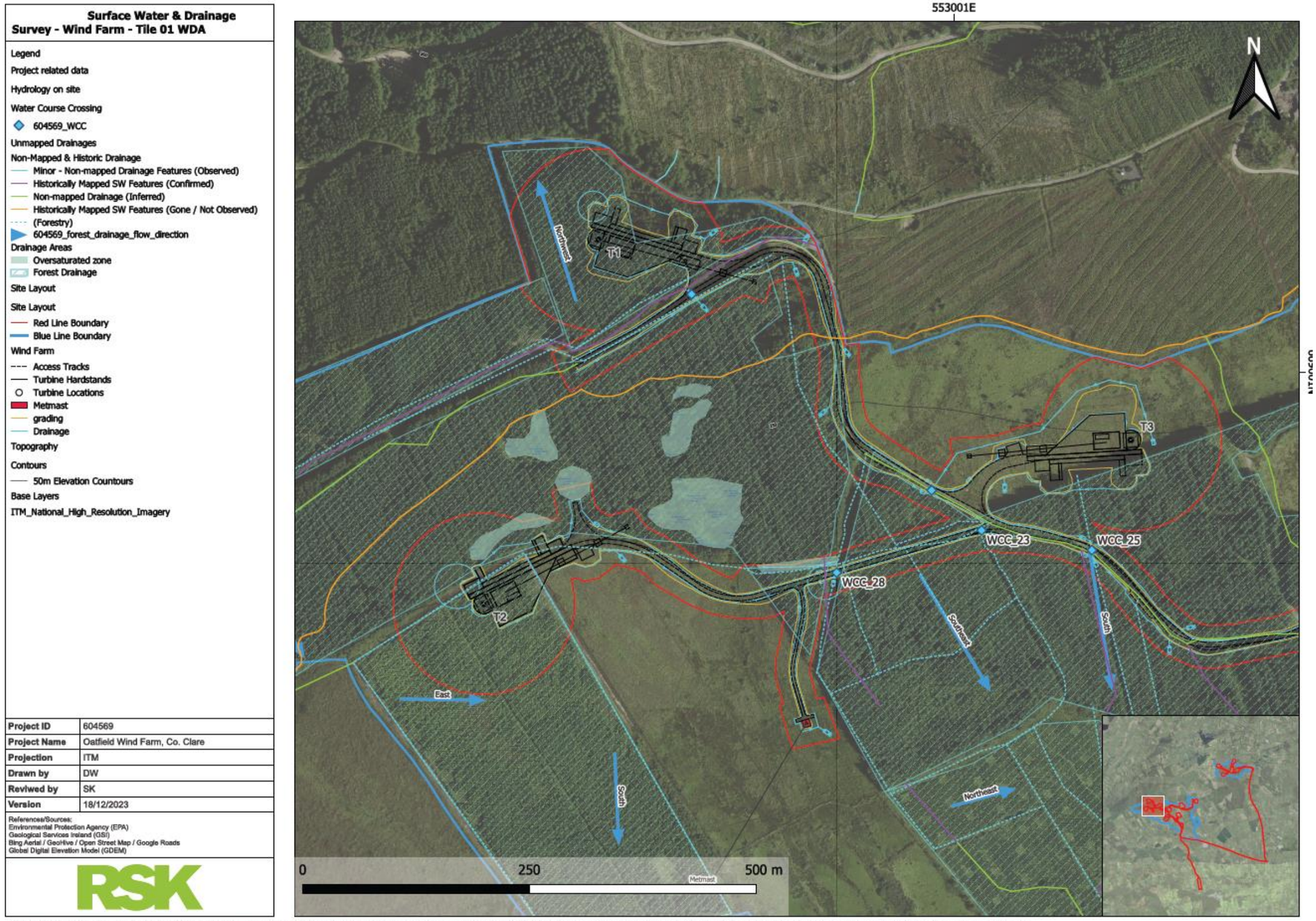
Drainage design as incorporated into the Proposed Development will ensure adequate protection of the environment and will be further refined at the detailed drainage design stage within the parameters set out in this EIAR to minimise modification and disruption of the existing hydrology. SuDS features will be designed in accordance with best practice guidance in "The SuDS Manual (Document ref: C753; CIRIA (2015))". The design principles, in summary, are as described below:

- Maintaining existing overland flow routes and channels. Existing natural flow paths lateral to access roads will be maintained through the use of piped crossings under the track alignments at natural depressions and at regular intermediate intervals. The spacing and exact position of cross drains will be specified at detailed design stage;
- Avoiding transporting rainfall runoff in long linear drainage swales by providing regular channel "breakouts", where water is encouraged to flow overland, thus maintaining existing natural hydrological patterns;
- Reducing surface water flow rates and volumes by attenuating runoff from tracks and hard standings "at source" by providing attenuation via check-dams in swales, whereby the flow velocity and rate of discharge are artificially reduced to mimic natural properties;
- Providing settlement ponds at turbine hardstanding areas and other main surface water discharge locations, where runoff from significant new impermeable areas will be treated and attenuated before being released overland; and
- All swales, crossings and other hydraulic features will be engineered to ensure that dimensions are suitable to convey predicted flows and so prevent the build-up of surface water and / or flooding.

3.2.3 Preliminary drainage design

There is one new watercourse crossing over a mapped stream between T6 and T7 which is included as part of the Proposed Development within the Western DA. This crossing will be achieved by a new clear span bridge. There a several existing drainage culverts to be upgraded on site. Drainage details are indicated in planning **Drawing Nos. 20959-NOD-XX-XX-DR-C-08301** and **20959-NOD-XX-XX-DR-C-08302.**

In order to avoid any impact to the lands due to construction, operation and decommissioning works, berms with a drainage ditch are proposed on either side of the permanent access tracks and around the turbine hardstands. These will be located such that any waste generated will be collected at check dams along the proposed drainage ditch before being rerouted towards existing stilling ponds. Refer to **Drawing No. 20959-NOD-XX-XX-DR-C-08301_S4_P01** for details on the proposed drainage ditch and roadside berms.



Note: Data points presented are georeferenced using open source data and/or a handheld GPS. This drawing / map is considered a conceptual model with reasonable accuracy for the purposes of environmental assessment. This drawing should not be relied upon for detailed design puporses.

Figure 3.1: Mapped drainage of the Western DA tile 1

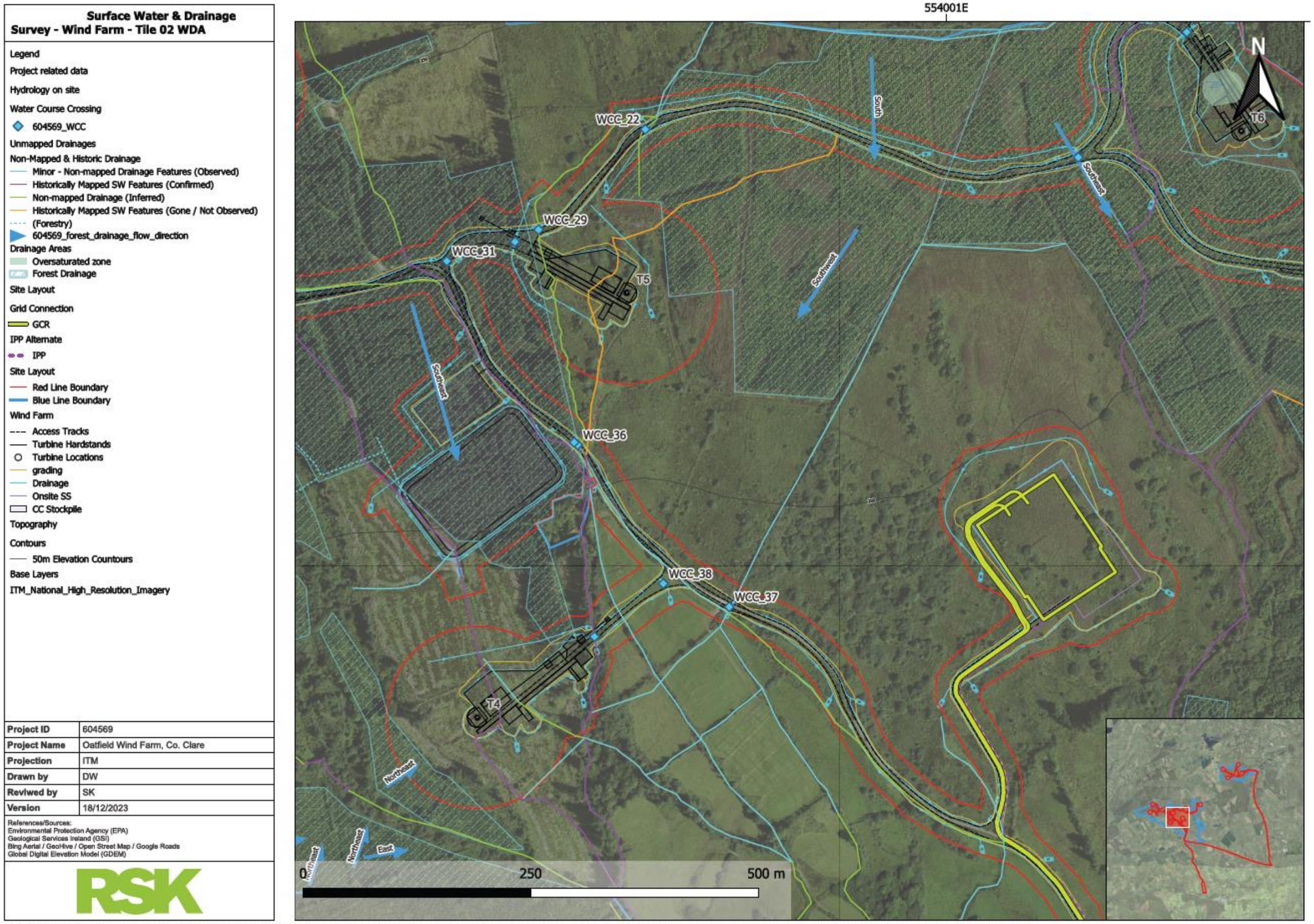


Figure 3.2: Mapped drainage of the Western DA tile 2

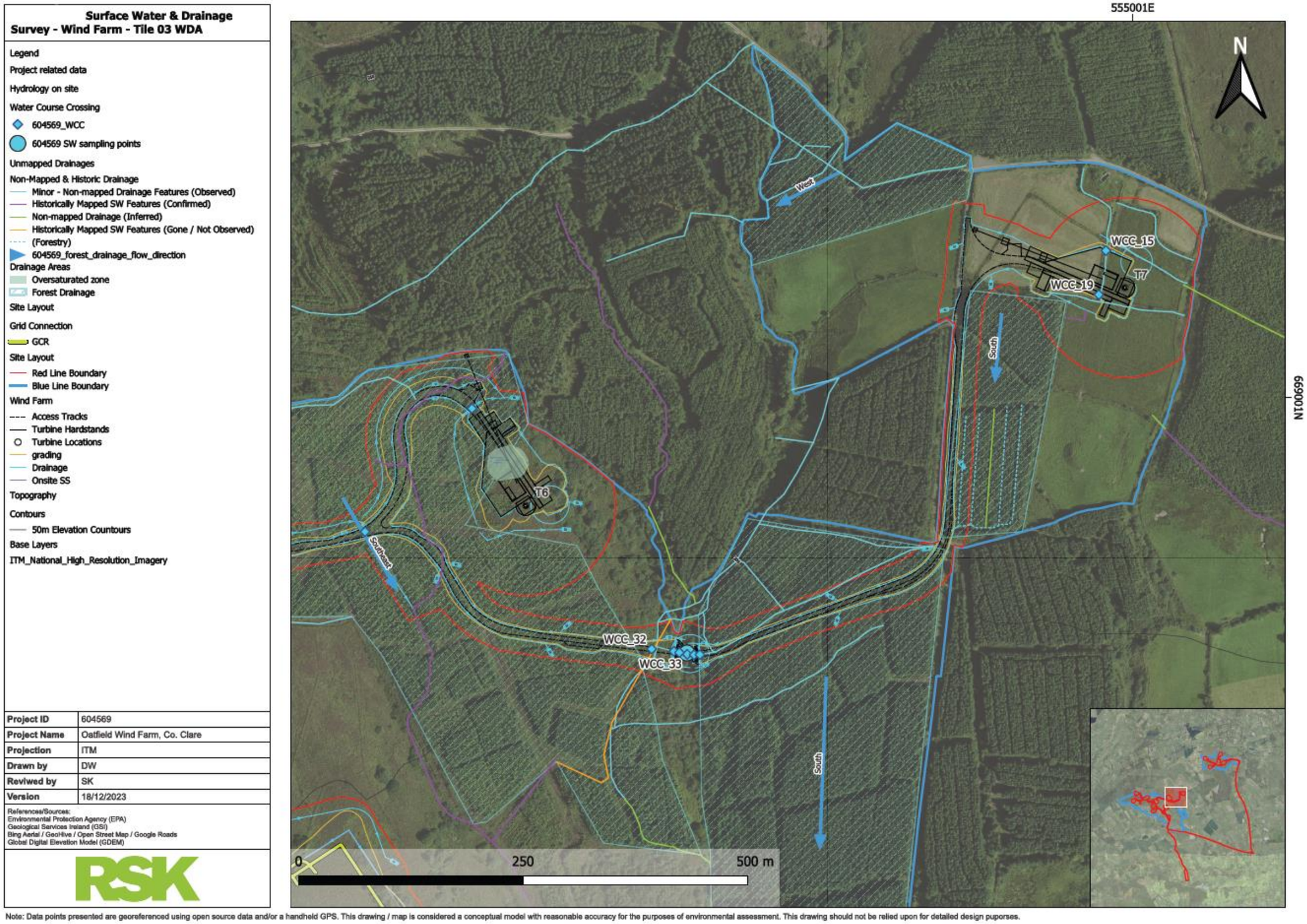
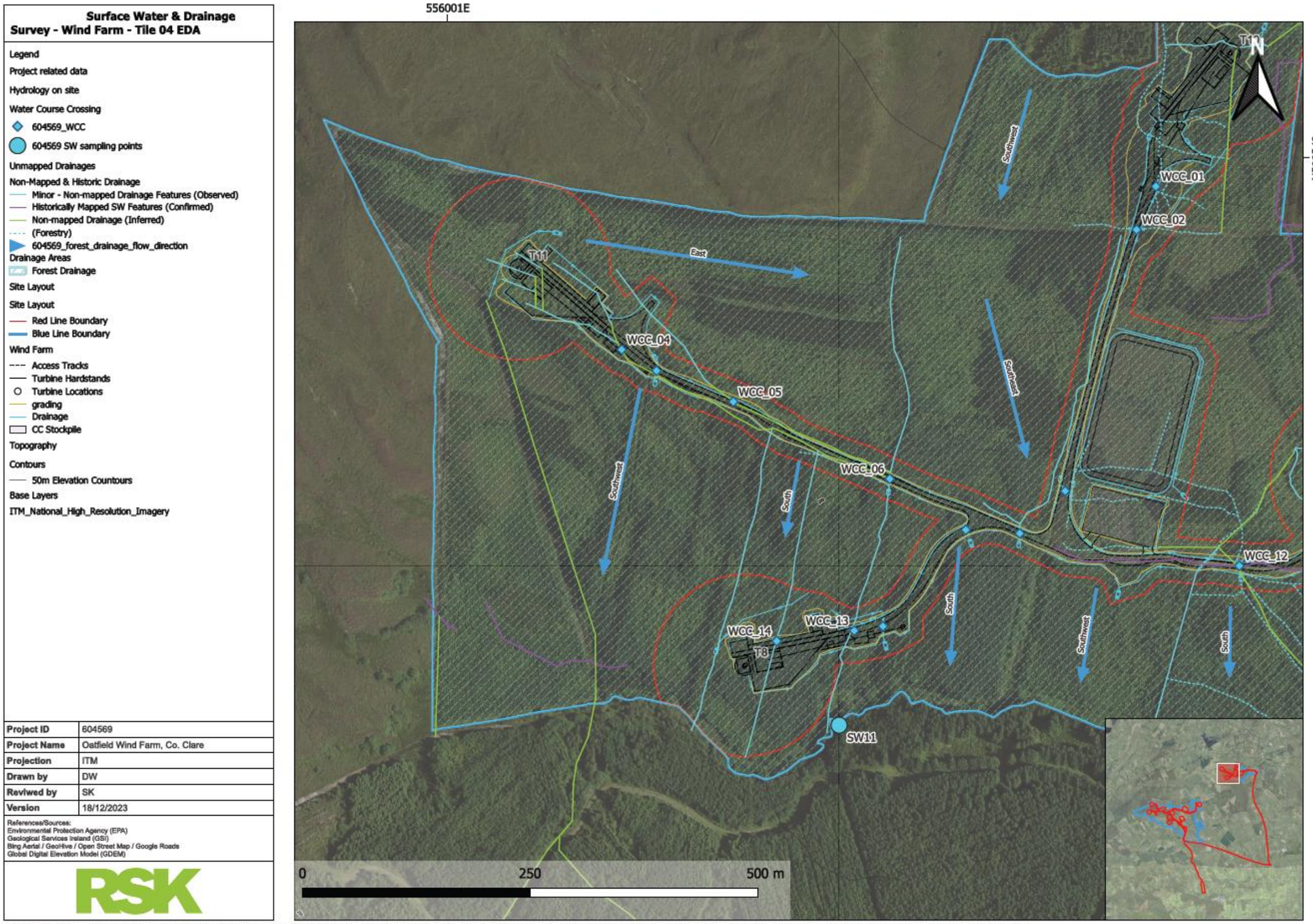


Figure 3.3: Mapped drainage of the Western DA tile 3



Note: Data points presented are georeferenced using open source data and/or a handheld GPS. This drawing / map is considered a conceptual model with reasonable accuracy for the purposes of environmental assessment. This drawing should not be relied upon for detailed design puporses.

Figure 3.4: Mapped drainage of the Eastern DA tile 4

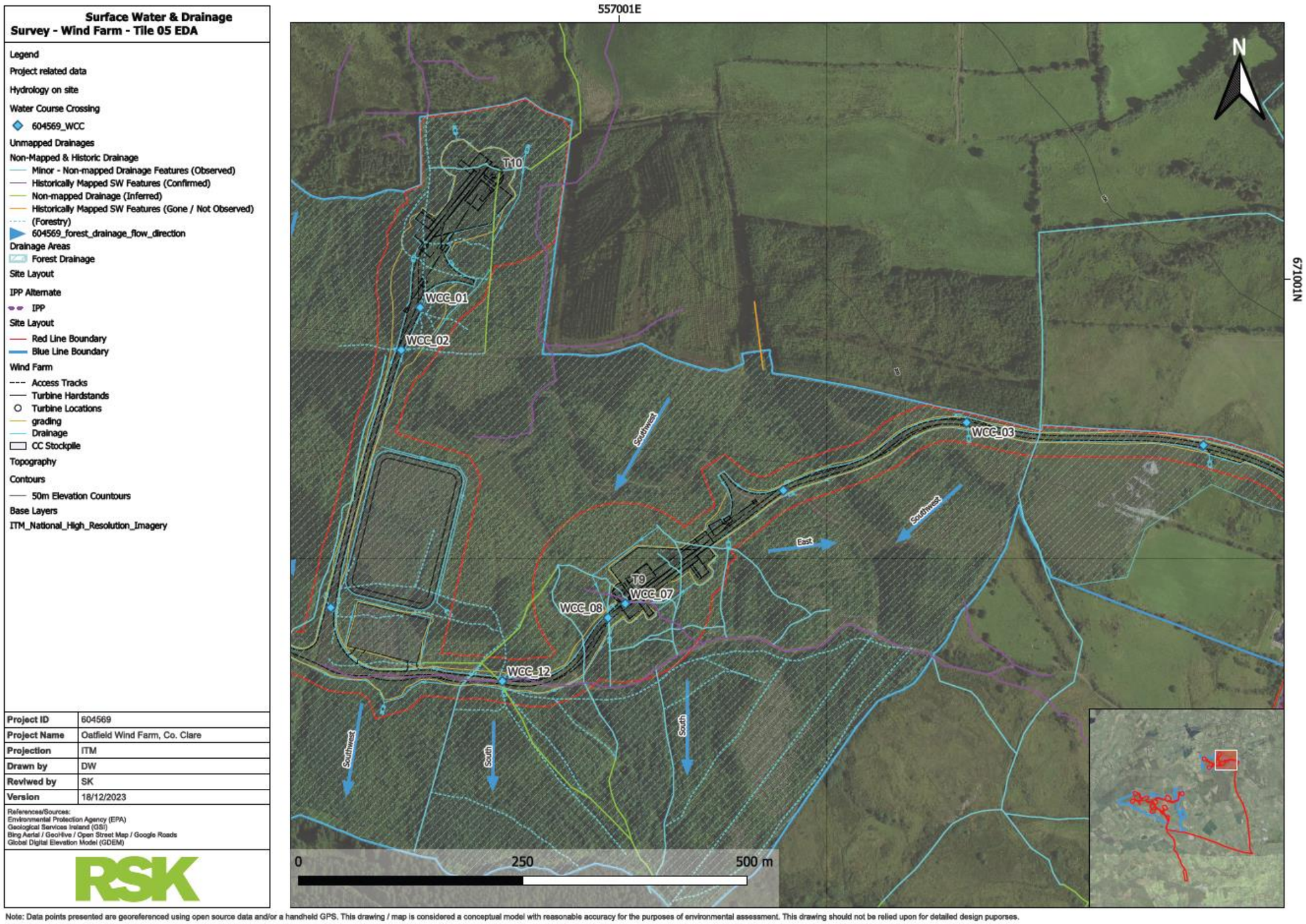


Figure 3.5: Mapped drainage of the eastern DA tile 5

3.3 Hydrogeology – Bedrock Aquifer

All references to Hydrology and Hydrogeology figures which are not presented in the text of this CEMP document can be found in **Appendix 9.6 of EIAR Chapter 9: Hydrology and Hydrogeology**.

Consultation with GSI Groundwater maps (2023) indicate that the Western PDA of the wind farm site (encompassing the location of T1 – T7) is underlain by a 'Poor Aquifer (Pl)' that is, bedrock which is generally unproductive except for local zones and small areas of aquifers with classifications of 'Locally Important Aquifer (Ll)'. The Eastern PDA (encompassing T8 – T11) of the development is underlain by a 'Locally Important Aquifer (Ll)' that is, bedrock which is moderately productive only in local zones (Chapter 9 of the EIAR, Figure 9.9a).

The Grid Connection Route is underlain by the same classification of aquifers (PI and Ll) as the development in Chapter 9 of the EIAR, Figure 9.9b.

The Turbine Delivery Route is underlain by the same classification of aquifers (PI and Ll) as the development but also Regionally Important Aquifer - Karstified (diffuse) (Rkd), Regionally Important Aquifer - Karstified (conduit) (Rkc) and Locally Important Aquifer - Bedrock which is Generally Moderately Productive (Lm) , **Chapter 9, Figure 9.9c**.

3.4 Groundwater Vulnerability

All references to Hydrology and Hydrogeology figures which are not presented in the text of this CEMP document can be found in **Appendix 9.6 of EIAR Chapter 9: Hydrology and Hydrogeology**.

Consultation with the GSI Groundwater Map Viewer (2023) indicates that the Wind Farm Site is underlain by areas classified predominantly mapped as 'Extreme (E)' vulnerability rating, with some areas mapped as 'Rock at or Near Surface (X)' vulnerability rating. The proposed location of T1, T3, T6, T10 and T11 have been mapped as areas with 'Rock near surface (X)' vulnerability rating. The proposed locations of T2, T4, T5, T7, T8 and T9 are in areas of 'Extreme (E)' vulnerability. (Figure 9.10a – Groundwater Vulnerability). Both the Turbine Delivery Route and Grid Connections traverse land with groundwater vulnerability ratings ranging from 'Low Vulnerability' to 'Extreme Vulnerability' including 'X' which is described as "Rock at or near Surface or Karst" Figure 9.10b – Groundwater Vulnerability.

3.5 Designated Site and Habitats

Designated and Protected Areas associated with the Development are detailed in EIAR **Chapter 7: Biodiversity**.

The nearest downstream designated areas include the following as outlined below:

- Gortacullin Bog NHA (EPA Site Code: 002401) 0.1km to the north of eastern portion
- Doon Lough NHA (EPA Site Code: 000337) 3.81km to the northwest of eastern portion
- Danes Hole, Poulnalecka SAC (EPA Site Code: 002401) 4km to the west of eastern portion

- Ratty Cave SAC (EPA Site Code: 002316) 6.29km to the west of western portion
- Lower River Shannon SAC (EPA Site Code: 002165) 13.2 km south of site,
- River Shannon and River Fergus Estuaries SPA (EPA Site Code: 004077) 13.2 km south of site

Proposed Natural Heritage Areas and non-hydrologically connected designated areas

- Castle Lake (EPA Site Code: 000239) 6km to the west of the western portion
- Knockalisheen Marsh (EPA Site Code: 002001) 6km to the south of the western portion
- Glenomra Wood NHA (EPA Site Code: 001013) 5.1 km southeast of eastern portion
- Glenomra Wood SAC (EPA Site Code: 001013) 5.1 km southeast of eastern portion
- Slieve Bernagh Bog SAC (EPA Site Code: 002312) 8.1 km northeast of eastern portion

No sections of the proposed grid connection traverse designated SAC, SPA or NHAs.

3.6 Landslide Susceptibility

All references to Land, Soils and Geology figures which are not presented in the text of this CEMP document can be found in **Appendix 10.5 of EIAR Chapter 10: Land, Soils and Geology**.

The Geological Survey of Ireland (GSI) has developed a Landslide Susceptibility map10 of Ireland. In consultation with this map (Figure 10.6a), the Proposed Development is considered to be of 'Low Risk' to 'Moderate Risk' in terms of landslide susceptibility. T6 and T10 are in areas which have been identified as 'moderately high' risk of landslide susceptibility. There is potential of 'High Risk' to landslide susceptibility to the north of the proposed T1 location.

The closest mapped Landslide Event (GSI, Landslide Events, 2023) recorded is c. 12km to the northeast which was described as a peat flow.

The Landslide Susceptibility along the Grid Connection Route (Figure 10.6b) is 'Low' Risk with some minor areas of 'Moderately Low' and 'Moderately High' Risk.

The Landslide Susceptibility along the Turbine Delivery Route (Figure 10.6c) is 'Low' Risk with some minor areas of 'Moderately Low' and 'Moderately High' Risk. The closest mapped Landslide Event (GSI, Landslide Events, 2023) recorded close to the TDR is c. 2.5km to the north at Killaloe which was described as a riverbank slide and occurred in 1948.

3.7 Constraint Buffers

As part of mitigation by avoidance during the design phase of the Development, groundwater, surface water, and drainage buffer zones were established where applicable.

The layout of the proposed wind farm has therefore been designed to minimise potential environmental effects. The layout was informed by the following objectives and constraints:

- Maintaining a setback from proposed turbines of 720m (four times the tip height) to the nearest point of non-financially involved dwellings), subject to a mandatory minimum distance of 500m for all dwellings (per Section 6.18 of the 2019 Draft Revised Wind Energy Guidelines);
- Maintaining a buffer of at least 20m from known archaeological monuments and cultural heritage features;
- Maintaining a buffer of at least 15m from minor watercourses and land drains (except where they are crossed by tracks or, in in the case of minor land drains, where a lesser buffer is applied or where the drain is re-directed);
- Maintaining a buffer of at least 50m from major surface water features;
- Maintaining a buffer of at least 25m from known karst features;
- Avoiding known buffers of existing telecommunications infrastructure links; and,
- Avoiding defined buffers for known areas of protected nesting birds, in accordance with good practice guidance (**refer to EIAR Chapter 7: Biodiversity, Appendix 7.1 SHMP**).

In relation to watercourses the following conservative approach has been applied:

- 50m Surface Water Buffer Zone applied to mapped surface water features i.e., mapped streams, rivers, lakes. Source for mapped surface water features; EPA.
- 15m Drainage Buffer Zone - Non-mapped drainage features i.e., non-mapped streams, natural and artificial drainage features.

Recommended groundwater buffer zones ranging from e.g., 15m (exclusion zone karst swallow holes) to entire catchments (source protection in regionally important karstified aquifer) depending on site specific characteristics such as:

- 250m Groundwater Buffer Zone – Groundwater abstraction points in relation to foundations, proposed access tracks and cable trenches. Source for mapped abstraction points: GSI. Not applicable, none within 250m of the Site.

Source Protection Areas – The entire area mapped as a public or group groundwater supply protection area. Source: EPA. This is applicable.

the following conservative approach has been applied:

- 100m Groundwater Buffer Zone – Groundwater abstraction points in relation to proposed access tracks and cable trenches i.e., shallow excavation. Source for mapped abstraction points: GSI. Applicable to the Site, Grid Connection and Turbine Delivery Routes.
- 250m Groundwater Buffer Zone – Groundwater abstraction points in relation to proposed borrow pit and foundations. Source for mapped abstraction points: GSI. Not applicable, none within 250m of the Site.

Not applicable to this Site:

- Source Protection Areas – The entire area mapped as a public or group groundwater supply protection area. Source: EPA. This is not applicable.
- Entire Catchment (Karst aquifer) – The entire catchment associated with a public or groundwater supply protection area which is underlain with a karstified aquifer. This will be assessed in detail as applicable. Not applicable.
- 15m Karst Features – No karst features identified on Site, depressions, sink holes, swallow holes etc.

While not applicable to this Development, some of the Development infrastructure footprint could typically fall within buffer zones due to the limiting circumstances associated with the Site and the Development, such as constraints related to other environmental disciplines including; ecology, ornithology, etc. restricted due to the proposed infrastructure itself whereby the proposed turbines require a minimum distance from each other to ensure the potential for wind turbulence impacting on downwind locations is minimised.

Some portions of the Development footprint fall within assigned buffer areas, including;

- One new Surface Water Crossing i.e., bridge, and associated access track and infrastructure is within a surface water 50m buffer.
- Forty-one new Surface Water Crossings i.e., culverts, and associated access track and infrastructure is within a surface water 15m buffer.
- Some sections of access track and Turbine Hardstands are within a drainage water 15m buffer.
- Cut and Fill around T4 falls within the 50m buffer of a mapped river; Blackwater (Clare), however it is kept out of the minimum requirement of 25m buffer.

4 OBJECTIVES OF THE CEMP

4.1 Overall Objective

The Overall Objective is to implement the construction of the development in a sustainable manner, as set out in the development design, construction standards and codes of practice, fully in compliance with the requirements of the EIAR, NIS and planning conditions ensuring no significant effect on the environment, amenity of the area or on human population.

4.2 Key Development Objectives

- Construct the development in a sustainable manner using sustainable sources of materials where possible, maximising reuse potential of natural materials, maximising waste recycling and minimising waste production requiring off-site disposal;
- Ensure all mitigation requirements as set out in the EIAR, NIS and which may be included in any Planning Consent are fully implemented;
- In particular prevent suspended solids, concrete, oils and debris from excavations, construction activities and material deposition from entering watercourses;
- Ensuring that emergency measures are in place should an unforeseen pollution incident or potential impact arise on site;
- Ensure compliance with the requirements of mitigation with respect to air and noise;
- Where incidents arise which trigger a review of the CEMP ensure that the CEMP is updated to include any additional mitigation measures or change of practices required;
- Ensure Good waste management and housekeeping is implemented, including having clearly labelled proper segregated waste management facilities on site, proper segregation is carried out and waste is removed by a Licensed waste Contractor;
- Maximising the reuse of excavated materials: stone, soil and subsoil material and avoidance of disposal off site to the extent possible;
- Ensure site security to avoid potential environmental impacts through unauthorised activity;
- Implement a Water Quality Monitoring Plan (Appendix A) to ensure no adverse effects on the environment or human population;
- Ensure compliance with environmental legislation particularly as it pertains to water quality, wildlife protection, Biodiversity, protected habitats and species and human health;
- Ensure construction works and activities are completed in accordance with any planning conditions for the development;

- Minimise the impact on local landowners and the local community which may arise from construction of the wind farm and the grid connection; and
- Provide adequate environmental training and awareness for all Project personnel at the commencement of the Project and periodically as required.

5 CONSTRUCTION ACTIVITIES

Experienced main Civil Contractor, Electrical Contractor and associated Subcontractors will be appointed to undertake the construction works required for the Development.

All Contractors and Subcontractors will be required to comply fully with this CEMP and any updates during the construction phase of the Project.

All Contractors and Subcontractors will be required to provide induction training, setting out the requirements of the CEMP, EIAR and NIS, with respect to protection of the environment and Human population, to all staff before commencement of construction activities.

Periodic toolbox talks must be held when any non-compliance incidents as a result of audit are identified which require updating of the CEMP, when complaints are received as a result of construction activities and when changes of legislation occur which trigger an update of the CEMP.

All Contractors and Subcontractors will be required to comply fully with the Health and Safety requirements as set out in National legislation.

Construction activity will involve all the necessary operations to construct the development as described. Note also that the precise order in which these activities will take place is not known at this stage.

- Site compound, Site Offices / Staff Welfare Units and Storage Compound;
- Temporary staff parking;
- Vegetation removal, topsoil stripping and excavation
- Subsoil excavation,
- Storage of topsoil and subsoil for future reuse, breakout and crushing of hardstanding,
- Construction of the drainage network, drainage and silt control measures including stilling ponds
- Importation of fill;
- Importation of steel
- Importation of concrete
- Construction of new units - foundation trenching, establishment of foundations, installation of utilities, SuDS, importation of building materials by HGV, storage of building materials, erection of units, erection of scaffolding, roofing, internal fit out and painting;
- Construction of access routes and parking areas - site levelling, earthworks, soil compaction, installation of road base, kerbing, road drainage, tarmacking and paving surface; and,
- Removal of hedgerows and reinstatement
- Construction of site tracks and upgrade of water course crossing as required;

- Construction of turbine crane hardstandings;
- Construction of turbine foundations and wind turbine assembly
- Construction of control building/substation;
- Construction of meteorological mast foundations and erection of met mast;
- Internal site cabling installation;
- Construction of Control building and substation including
    - Installation of switchgear/metering;
    - Installation of transformer and externals;
- Landscaping and Signage.
- Construction of the grid connection including;
    - Linear trenching, ducting along the road network;
    - Construction of cable joint bays (at intervals along the route;
    - Cable pulling and interface with the wind farm;
    - Off-site remedial works associated;

5.1 Typical Equipment

A list of typical equipment to be used on site during the construction period is summarised below;

Site Preparation

- Wheeled Loader Lorry
- Diesel generator
- Tracked Excavators
- Dozer
- Dump Truck

Ground Works/Piling

- Excavator mounted rock breaker
- Pile driver/Crane Mounted Auger
- Tracked Excavator
- Wheeled Lorry Loader
- Dump Truck
- Pump
- Compressor

General Turbine Construction

- Articulated Lorry

- Haulage and delivery vehicles articulated and non-articulated;
- Wheeled Mobile Crane
- Tracked Mobile Crane
- Concrete Mixer Truck and Pump
- Pump
- Compressor

Access track construction

- Tracked Excavators
- Haulage and delivery vehicles articulated and non-articulated;
- Dozer
- Dump Truck
- Road roller

Miscellaneous

- Fuel tank delivery vehicles Heavy goods vehicle, Haulage and Delivery vehicles
- Hand Tools including Hammers, Crow Bars, Shovels, Wheelbarrows;
- Power Tools including Stihl Saws, Battery Drills, Angle Grinders;
- Forklift, Scaffold including Hop Ups and Aluminium Towers;
- Pumps to enable excavation and service trenches to remain dry;

5.2 Site Clearance and Earthworks

It is anticipated that significant vegetation clearance, vegetation maintenance, earthworks and ground preparation from cut and fill works will be required as part of the development. It is currently estimated that the quantity of excavated material due to site clearance and preparation of foundations, access tracks and substation will be approximately **100,744m³** of topsoil, **72,769m³** of subsoil and **15,363m³** of rock inclusive of Option A grid connection and **101,091m³** of topsoil, **74,390 m³** of subsoil and **15,363m³** of rock inclusive of Option B grid connection.

Removal of the existing topsoil layer (approx. 300mm thick) will occur at the wind turbine locations, hardstand areas, drainage network, substation location, meteorological mast location, pond areas, contractors' compound and along the road network, which will equate to an estimated **100,744m³** to **101,091m³** of material generated. Stripping and removal of the topsoil layer will be coordinated with the proposed staging for the development. The extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work area(s) and will be programmed to minimise soil handling / double soil movements. Stripped topsoil will be temporarily stockpiled and reused on site for roadside and hardstand berm construction. Topsoil will also be spread on site adjacent to the infrastructure. Approximately, **100,939m³** of topsoil will be reused on site for the purpose of berm construction and landscaping purposes.

The residual topsoil material, approximately **152m³**, will be stockpiled in designated areas for later use in site decommissioning.

Excavation of subsoil layers will be required as part of turbine foundation excavation, drainage, substation and meteorological mast installation. It is estimated that the quantity of subsoils to be excavated due to site clearance and preparation will be **72,769m³** to **74,390m³**depending on the Grid connection option constructed.

Disturbed subsoil layers will be stabilised as soon as practicable and reused in road construction for gradient purposes, in construction of berms, hardstand areas, underlying wind turbine foundations and for internal grid construction. An estimated to **83,706m³** to **85,052m³** of subsoil will be reused for this purpose. Approximately 10,937m3 of fill subsoil will be imported to site meet the overall requirement.

An estimated **15,363m³** of weathered rock and bedrock will be excavated and transported off site where it will be crushed and graded and then reused on site.

All suitable non-hazardous excavated material will be reused on site where possible. Any excavated material that cannot be reused shall be handled and transported to designated stockpile areas on site.

A summary table of material excavations, reuse and imported is provide in Table 5.1 below, which represents the worst case with the grid connection to Option B, the Ardnacrusha to Drumline 110kV Overhead Line loop-in connection.

Table 5.1 Excavations and Import Quantities

	Excavation			Construction					
Imported Sand (m^3)	**Total Excavated Topsoil (m^3)**	**Total Excavated Subsoil (m^3)**	**Total Excavated Rock (m^3)**	**Material requirement topsoil (m^3)**	**Material requirement subsoil (m^3)**	**Imported aggregate (m^3)**	**Reused aggregate(m^3)**	**Imported Concrete (m^3)**	**Imported Sand (m^3)**
Access Tracks	26,733.82	5,153.72	-	-	-	12,622.76	5,624.13	-	-
Access Track Berms	-	-	-	38,984.32	8,005.71	-	-	-	-
Compound	990.00	-	-	-	-	990.00	-	-	-
Drainage	6,214.32	6,214.32	-	-	-	-	-	-	-
Hardstands	22,251.70	-	-	1,294.70	2,589.40	-	9,808.92	-	-
Hardstand Berms	-	-	-	24,084.79	24,473.26	-	-	-	-
Wind Turbine Foundations	2,187.43	10,207.99	9,478.85	-	6,704.30	8,363.24	-	6,806.72	-
Substation	4,995.87	825.42	-	-	-	4,710.91	-	1,423.76	-
OHL Mast	31.10	176.26	103.68	-	-	15.55	-	311.04	-
Meteorological Mast	11.52	65.28	19.20	-	-	-	-	96.00	-
Internal grid	1,400.58	3,268.02	-	-	4,493.53	-	-	-	175.07
GCR and IPP	11,703.97	36,080.57	-	-	38,786.00	-	-	-	2,838.00
Topsoil Spreading	-	-	-	36,574.97	-	-	-	-	-
Summary Totals	76,520.30	61,991.58	9,601.73	**100,938.78**	**85,052.19**	**26,702.47**	**15,433.05**	**8,637.53**	**3,013.07**
Summary with Bulking Factors	**101,090.97**	**74,389.89**	**15,362.76**	-	-	-	-	-	-

Pre-earthworks drainage measures will be installed prior to earthwork activities such as access track and other infrastructure construction in order to Divert ‘clean’ surface water run-off and stormwater away from exposed soils of earthworks preventing further erosion; and to Prevent ‘clean’ water from mixing with potentially silt-laden water generated from construction works.

Best practice pre-earthworks drainage measures may include:

- Cut-off/ diversion ditches;
- Temporary interception bunds;
- Swales; and
- Retention ponds

Stilling ponds will be constructed on construction works drainage to allow silt laden water to settle out before discharge into the main drainage network.

The presence of Japanese Knotweed has been identified at seven locations on the Proposed Development (see **Chapter 7 Biodiversity, Appendic C, Figure 7.18)** of the EIAR). The removal, treatment and disposal of any identified invasive non-native plants will be undertaken in accordance with the latest guidance. An Invasive Species Management Plan has been developed to prevent further growth or spread beyond the Proposed Development.

5.3 Culverts / Crossings

Watercourse crossings will be by means of Flat bed or Horizontal Directional Drilling (HDD) Methodologies. The exact method will be confirmed at detailed design stage of the proposed Development construction. A typical flatbed method of crossing is shown in Figure 5.1**.**

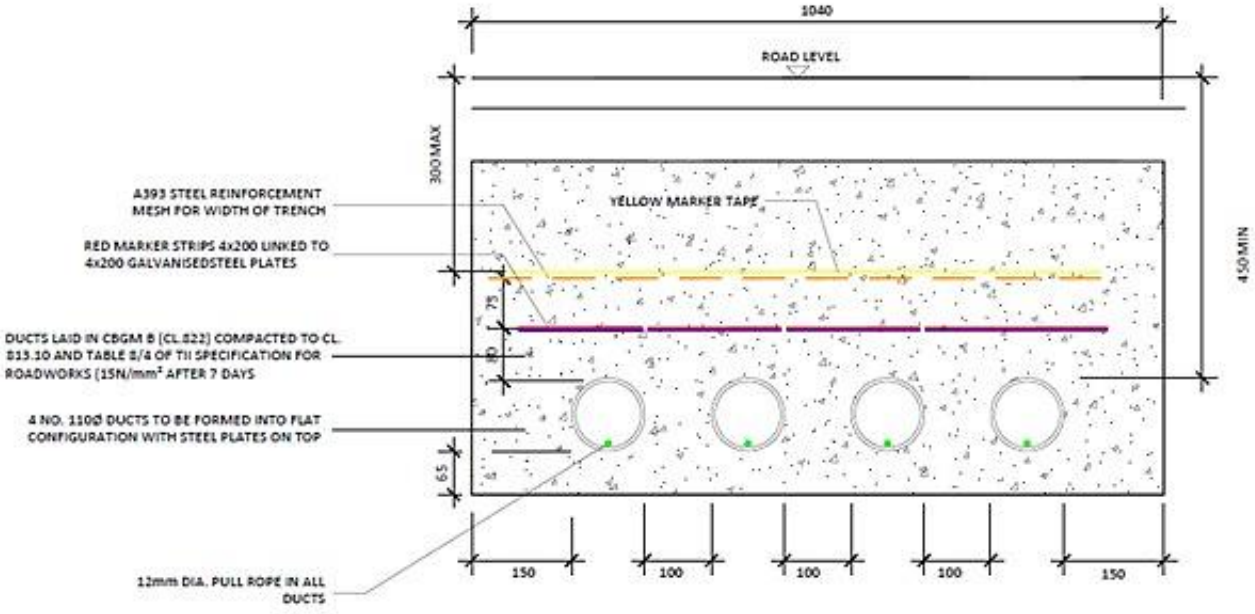


Figure 5.1. Typical Flat Bed method of watercourse/culvert crossing

In a typical Flatbed formation crossing, ducts are laid in flat formation in compacted cement bound granular material and protected by a steel plate and steel reinforcement mesh. In a typical HDD crossing, **see Figure 5.2**, cable ducts are directionally drilled under the watercourse/culvert from a launch to a retrieval pit.

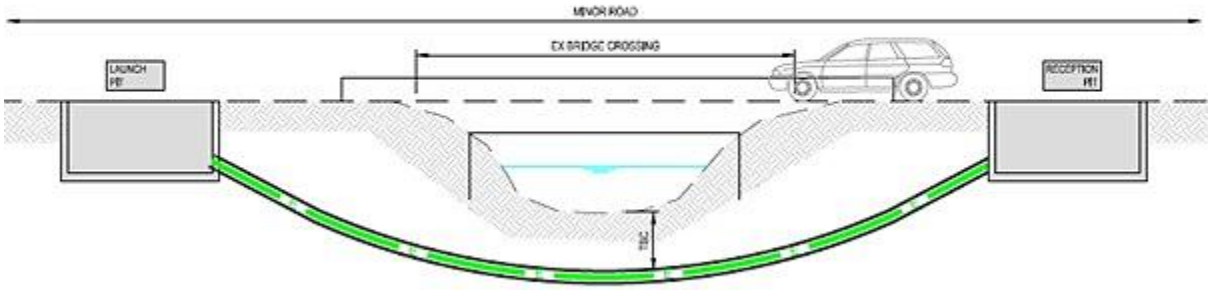


Figure 5.2: Typical Horizontal Directional Drill method of watercourse/culvert crossing

Watercourse crossings over mapped rivers at the Proposed Development Site are listed in the following **Table 5-2** and shown in Chapter 9 Hydrology and Hydrogeology on **Figure 9.2 and 9.6;**

Table 5-2 Watercourse crossings on site

Crossing Number	Type	E ITM	N ITM
WCC_01	New Culvert	556778	670969
WCC_02	New Culvert	556757	670922
WCC_03	New Culvert	557468	670825
WCC_04	New Culvert	556192	670791
WCC_05	New Culvert	556315	670733
WCC_06	New Culvert	556488	670652
WCC_07	New Culvert	557007	670639
WCC_08	New Culvert	556988	670623
WCC_09	New Culvert	556681	670596
WCC_10	New Culvert	556707	670560
WCC_11	New Culvert	556830	670557
WCC_12	Culvert to be upgraded	556867	670553
WCC_13	New Culvert	556448	670482
WCC_14	New Culvert	556362	670470
WCC_15	New Culvert	554971	669165
WCC_16	New Culvert	554837	669151
WCC_17	Culvert to be upgraded	552786	669132

Crossing Number	Type	E ITM	N ITM
WCC_18	New Culvert	552739	669118
WCC_19	Culvert to be upgraded	554963	669116
WCC_20	New Culvert	552871	669038
WCC_21	New Culvert	554188	668929
WCC_22	New Culvert	553670	668883
WCC_23	New Culvert	553042	668833
WCC_24	New Culvert	554234	668813
WCC_25	New Culvert	553153	668805
WCC_26	New Culvert	552950	668803
WCC_27	New Culvert	552665	668803
WCC_28	New Culvert	552872	668780
WCC_29	New Culvert	553553	668772
WCC_30	New Culvert	553558	668739
WCC_31	New Culvert	553420	668731
WCC_32	New Culvert	554465	668721
WCC_33	New Bridge	554505	668715
WCC_34	New Culvert	553254	668706
WCC_35	New Culvert	553490	668633
WCC_36	Culvert to be upgraded	553596	668536
WCC_37	New Culvert	553763	668358
WCC_38	New Culvert	553644	668351
WCC_39	New Culvert	553615	668327
WCC_40	New Culvert	553512	668240
WCC_41	New Culvert	554057	668127
WCC_42	Culvert to be upgraded	554070	668099

A new watercourse crossing is associated with the proposed new Site Access Roads. Existing watercourse crossings are associated with existing Site Access Roads and will require upgrading.

Watercourse crossings listed above, locations are identified by means of assessing the Site layout and where it intersects existing drainage mapped as part of this assessment. There remains the potential for location of clear span bridges as part of the detailed design, particularly if associated with minor drainage which will be subject to modification and diversion in some instances.

Watercourse Crossings Grid Connection

The Grid Connection Route crosses over the Blackwater (Clare) River twice. These water crossing, **Table 5-3,** will either be in the existing bridge deck using the reduced cover method, or if the bridge cannot accommodate the cable, a Horizontal Directional Drill (HDD) may be required, see **Chapter 5, Section 5.5.11**.

Table 5-3: Watercourse crossings on Grid Connection Route

Crossing Number	Type	E ITM	N ITM
WCC_42	Culvert to be upgraded	554070	668099
WCC_43	Existing Bridge – HDD required	554211	667228
WCC_44	Existing Bridge – HDD required	555101	665329

The grid connection route crosses a section of the R471 southeast of the western portion of the site, where it crosses the Gourna_010 River before splitting. They then reconverge once they cross the Cloverhill stream_010, east of Shannon.

In total Option A has seven (No. 7) watercourse crossings and Option B has nineteen (No. 19) watercourse crossings.

Watercourse Crossings IPP Cabling

The IPP Cabling crosses over the Blackwater (Clare) River and other smaller streams, see Table 5.2. These water crossing will either be in the existing bridge deck using the reduced cover method, or if the bridge cannot accommodate the cable, a Horizontal Directional Drill (HDD) may be required, see **Chapter 5 Section 6.2**.

Table 5.2: Watercourse crossing IPP Cable

Crossing Number	Type	E ITM	N ITM
No. 10A	Crossing watercourse_unnamed culverted bridge – HDD or Flat Bed	555079	667192
No. 19A	Crossing watercourse CL-R471-011.00 culverted bridge - HDD or Flat bed	556656	666677
No. 26A	Crossing watercourse CL-R471-012.00 culverted bridge - HDD or Flat Bed	557545	666339
No. 32A	Crossing watercourse culverted bridge River Blackwater - HDD or Flat Bed	557915	666228

Crossing Number	Type	E ITM	N ITM
No. 36A	Crossing watercourse CL-R471-014.00 culverted bridge – HDD or Flat Bed	557915	666228
No. 43A	Crossing watercourse_unnamed culverted bridge – HDD or Flatbed	558312	667258
No. 47A	Typical Trenching in public road corridor along the local road at the East side of Site (Crossing watercourse_unnamed culverted bridge)	558235	667912
No. 48A	Typical Trenching in public road corridor along the local road at the East side of Site (Crossing watercourse_unnamed culverted road)	558155	668223

5.4 Grid Connection

5.4.1 Grid Connection

The proposed design for the 110kV Loop-In to the existing OHL will require two new Interface Mast structures which will be constructed under the existing 110kV OHL. The existing OHL conductor will be terminated at these two new structures in order to transition from an overhead line to an underground cable arrangement to facilitate the loop into Proposed Development 110kV Substation via cable chairs. The existing conductor will be removed between the Interface Mast structures with the new connection looped through to the new Proposed Development 110kV Substation.

The new interface mast structure locations were selected based on ground surveys, ground profiles, allowable angles and ruling span checks. The expected duration of works is expected to be approx. 4 weeks. Construction of foundation circa. 7 days each, erection of the Interface masts circa 5 days, weather dependant.

The cable route for Option A follows the existing trackway (which will be updraded) and road infrastructure from the Proposed Development 110kV substation, located in the Western DA) to the proposed loop-in location to the existing Ardnacrusha – Ennis 110kV OHL at Ballycar North. A short section of the cable route will be ducted from the existing road network through third party lands at Ballycar North to the loop-in masts location. An access track will be constructed on these third-party lands to facilitate construction of the cable ducts and maintenance of the cables. This Option is 3.83 km in length. This is shown on Figure 5.1.

Figure 5.3: Location of the Eastern and Western DA

Cable ducting trenches will be 2000mm in width and 1200mm deep. The section of road leading from the Western DA to the junction with the R471 will also accommodate the IPP cable from the Eastern DA to the proposed 110kV substation. Each cable trench will accommodate 3 cable ducts (three phases of electricity and two communication ducts).

A total of ten cable joint bays will be constructed along the cable route to the Loop-in masts in Ballycar North, five on each circuit. The cable joint bays will be staggered within the existing roadway at the cable joint bay locations. Each joint bay will comprise a concrete bay 4.5m in length 2.3m in width and 2.4m in depth.

Two communication chambers will also be constructed at each cable joint bay associated with each 110kV underground cable. These chambers will be 1.25m in length, 1.1m in width and 1.25m in depth.

The cable ducting will be placed into the prepared trench, inspected, and then the trench will be backfilled and the surface of the road reinstated.

110kV cables will be pulled from truck or trailer mounted cable reels through the ductwork from the proposed development 110kV substation to the Loop in location on the Ardnacrusha to Ennis 110kV Overhead Line Sections of cable will be jointed along the cable route at the cable joint bay locations.

The method of connection will be via a substation/CSE towers at the identified loop in area. The grid connection from the proposed wind farm substation to the loop-in substation/CSE towers will be over approximately 3.3km via a 110kV cable which will be underground and constructed primarily within the existing road corridor. The design of the grid connection into the 110kV over headline will comply with ESBN / EirGrid specifications and technical and operational requirements.

The existing 110kV OHL conductor will be terminated at these two new structures to transition from an overhead line to an underground cable arrangement to facilitate the loop in via cable chairs. The existing conductor will be removed between the Interface Mast structures with the new connection looped through to the new Proposed Development 110kV Substation.

The cable route for Option B (Ardnacrusha to Drumline) follows the exact same cable route as Option A with the only difference being that the 110kV double circuit continues further south for a distance of 300m on third party lands to the interface location with the existing Ardnacrusha to Drumline 110kV OHL. Again, the interface will occur via two new interface masts beneath the line. The existing 110kV OHL conductor will be terminated at these two new structures in order to transition from an overhead line to an underground cable arrangement to facilitate the loop in via cable chairs. The existing conductor will be removed between the Interface Mast structures with the new connection looped through to the new Proposed Development 110kV Substation. The total length of this option is 4.16km.

As part of the detailed engineering design, site investigation works will be undertaken to determine ground conditions, the extent of any underground features (i.e., bridge foundations) and depth of cover to inform detailed design of the grid connection. Further consultations with utility providers such as Uisce Éireann, Gas Networks Ireland, and the Clare Country Roads Authority will be undertaken as part of detailed design to confirm methods of construction for the grid connection.

The grid connection cabling will be installed in trenches (c.1.25m deep and 2.0m wide), which will be laid with five cable ducts through which the three electrical cables,

communications cables, and copper cables (if required), will be pulled. The ducts will be laid on bedding sand and then surrounded by concrete, red cable protection strip and yellow warning tape and steel protective plates, if required at the location, will be placed in the trench before the top of the trench is backfilled and reinstated.

In areas where a watercourse must be crossed, and where HDD is required, HDD crossing will be utilised with a launch and reception pit on either side of the crossing. The HDD crossing has been used in 2 locations in Grid Route Option 1 (Crossing point No.1 **(Plate 1)** and Crossing point No. 2 **(Plate 4).**

Plate 1: HDD crossing point no.1

Plate 1: HDD crossing point no. 2

Temporary land take will be required to facilitate the HDD at these locations which will result in excavation in adjacent farmland and temporary loss of hedgerow which will be reinstated post construction.

In terms of the HDD process, small-scale quantities of greases known as 'drilling fluids' are also commonly used during the drilling process to keep components of the drill rig cool and lubricated. These drilling fluids are commonly composed of a mixture of bentonite clay, which can be harmful to the environment. Drilling fluids such as Clearbore, which is an environmentally friendly, High-Performance Water-Based Mud suitable for tunnelling and drilling operations, or fluids with similar environmental properties will be used in drilling operations. Where the proposed grid connection cable route encounters minor culverts, the ducts will be installed above or below the culvert depending on its depth. The cable ducting will be installed so as not to impact the existing culvert.

The cables will be pulled through the ducts and joined together at joint bays located along the route. The Joint Bay will comprise three underground pre-cast concrete chambers – a joint bay chamber (6m long, 2.5m wide and 2m deep), along with two smaller communication link box chambers see **Drawing No. 20959-NOD-XX-XX-DR-C-08245**. Cable pulling, jointing and testing will be carried out at the start and end point and at each Joint Bay. Once the cables have been jointed and commissioned, the entry and exit and joint bay chamber will be filled with sand and a concrete cover fitted on top.

A man-hole type cover will be fitted over the start and end points of the grid connection cable route and over the Link Bay chambers. Over-ground identification marker posts and marker plates will be installed along the route. The manhole covers and marker plates/posts will be the only surface expression of the cabling when works are completed.

Over-ground identification marker posts and marker plates will be installed along the route. The manhole covers and marker plates/posts will be the only surface expression of the cabling when works are completed. Cables will be installed in accordance with the EirGrid Functional Specification for the installation of 110kV underground cables and in accordance with any updates.

Joint bays will be approximately 700m apart and their proposed locations are provided in in Figure 5.4 below. Joint Bay locations may be refined further following detailed design and in further consultation with ESB and/or Eirgrid.

A total of ten cable joint bays, with associated communication chamber boxes will be constructed along the cable route.

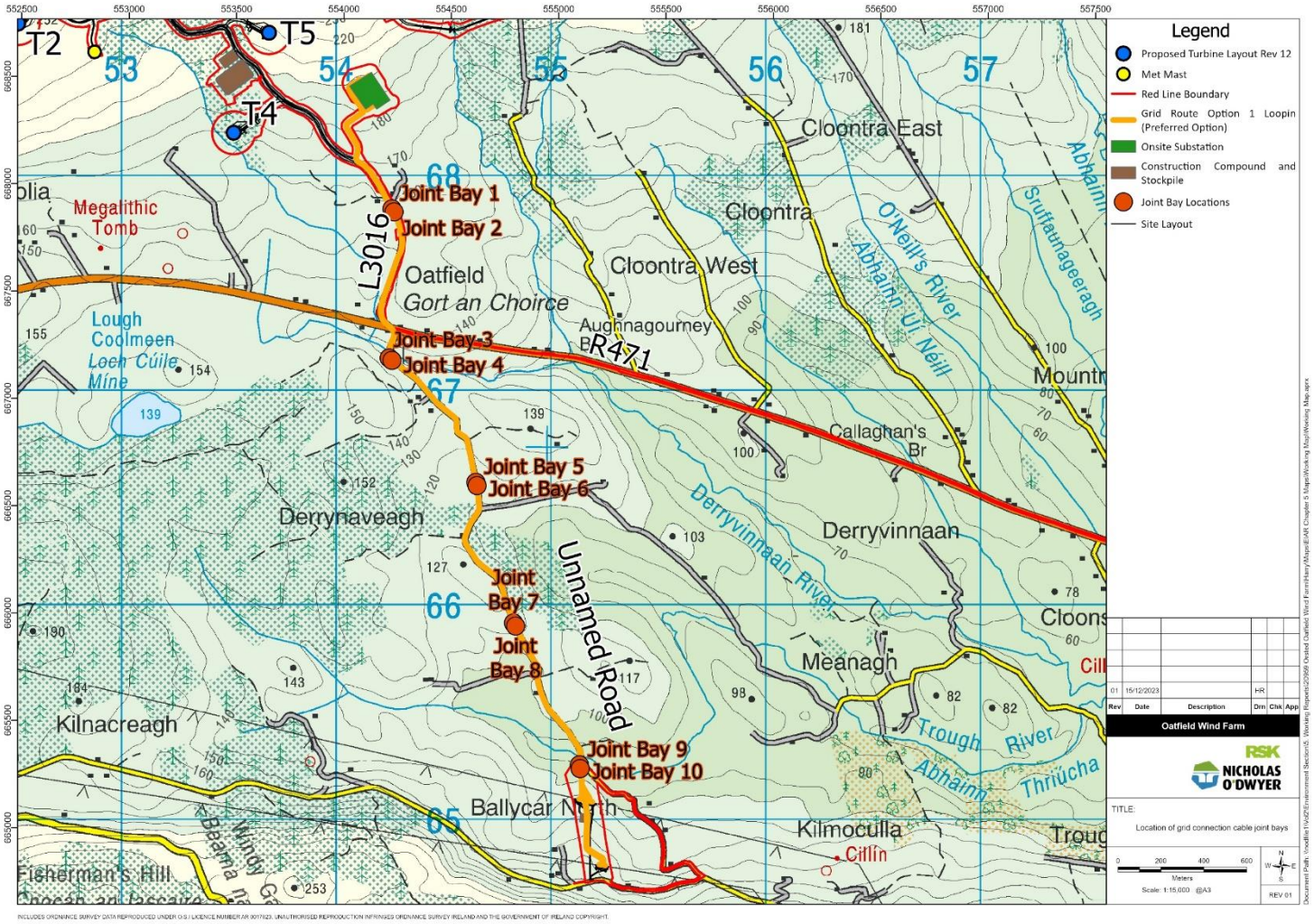


Figure 5.4 Locations of grid connection cable joint bays

5.5 Management of Surplus Material

It is envisaged that material excavated to construct all infrastructure elements of the wind farm (foundations, tracks, hardstands, etc.) will be used as access track backfill, berm construction, for site reinstatement and landscaping purposes.

A Spoil Management Plan has been prepared for the Development and is included as **Appendix B** to this CEMP.

As per Table 5.1 above, the majority of spoil generated on site will be of subsoils and till with some rock excavated at foundation locations.

As stated above, the majority of rock excavated on site will be reused for the enhancement of site ponds following removal from site, crushing and degrading and returned to site for this purpose.

A summary estimate of materials excavated at the wind farm site and reused in construction is provided in Table 5.3 below.

Table 5.3: Balance of Materials Generated and Reused

Balance of materials following reuse on site	Generated (m^3)	Reused on site (m^3)	Balance of material (m^3)
Topsoil	101,091	100,939	152
Subsoil	74,390	74,390	-
Aggregate/rock on site	15,363	15,363	-

The balance of surplus material will be temporarily stored for a relatively short period during the construction phase. It will be stored in designated temporary spoil deposition storage areas to be used during reinstatement and will be limited to 1m height.

The material excavated for the construction and upgrade of site access tracks will be placed mainly in berms alongside the wind farm access tracks and/or stockpiled in designated temporary storage areas (at a height not exceeding 1m).

In relation to excavated material removed during the grid connection network installation, any earthen (sod) banks to be excavated will be carefully removed and stored separately, maintained and used during reinstatement. Surplus excavated material from roadways will be reused if suitable or disposed of to a licenced waste facility.

The use of soil stockpiles will be minimised by earthworks planning. However, where stockpiles are used, silt fences and silt mats will be employed to minimise sediment levels in run-off.

All stockpiled material will be stored at least 50m from permanent mapped watercourses in order to reduce the potential for sediment to be transferred into the wider surface water system and will be regularly inspected to ensure that erosion of the material is not taking place. Any surplus materials will be removed from site by a Licenced Waste Contractor

With regard to excess material from the construction of the cable joint bays and communication chambers an estimated 1,485m^3 will be removed from the construction site and brought to a licensed waste handling facility.

5.6 Importation of Fill for Wind Farm Construction

The importation of fill material will be required for access track construction, wind turbine base and backfill, substation, hardstand area and temporary construction compound. It is estimated that **26,702.47m³** of material will be required to be imported onto the site.

Fill material will be sourced locally and will comprise of coarse aggregate or finer partial engineering fill or clay depending on geotechnical engineered specifications.

Any infill material/landscaping that is required will be placed and levelled in appropriate lift thicknesses to ensure the material is not over compacted thereby retaining its drainage properties.

Only suitable material will be allowed on site, this may be achieved through chemical testing prior to importation. Provided the imported material is a product with known characteristics, minimal monitoring or validatory sampling of imported loads of the material will be required, however visual inspection of all material in each load will be conducted as a minimum.

Temporary stockpiles of imported material will be kept to a minimum. Fill areas, when target elevation has been achieved, will be stabilised as quickly and efficiently as possible.

5.7 Importation of Concrete for Proposed Development Construction

The importation of approximately **8,638m³** of imported concrete will be required for construction of the wind farm foundations, substation buildings and meteorological mast foundations.

5.8 Road and Utility Crossings

An engineering assessment was undertaken on the proposed grid connection route. This included field survey and engagement with the Clare County Roads, Transport Infrastructure Ireland, Gas Networks Ireland, and Iarnród Éireann to determine the best engineering solution for crossings of National Roads, bridges and watercourses.

5.9 Wind Farm site and Underground Cabling

All power, communication and control cabling on the wind farm will be installed underground in excavated trenches which will be routed from the wind turbines to the wind farm substation, which is located in the Western PDA. Electricity generated by the wind turbines will be fed through internal site power cables to the wind farm substation along the path of site access tracks to where these join the local road network and then along these roads. The eastern section will be connected to the wind farm substation by an IPP cable ducted in the existing local road network as shown on **Figure 5.6**. The IPP cable will be ducted from the turbine cluster in the Eastern DA along the unnamed local road for approximately 5.1km to where it joins the R471 Regional Road. It will then be ducted westwards along the R471 for approximately 4.3km to the junction with an unnamed road leading to the Western DA and will be ducted along this road to the substation location itself, a further distance of approximately 1.1km.

Similarly, the wind turbine internal cabling in the Western DA will be ducted along the local unnamed road southwards to the windfarm substation, a distance of 1.9km.

When trench excavation works commence, the surface vegetated topsoil will be removed from the trench path and retained on the ground surface adjacent to the trench.

Along the access tracks the excavated cable trenches will be approximately 600mm in width and up to approximately 900mm deep. The cable ducting will be placed into the prepared trench, inspected, and then the trench will be backfilled. Excavated material will be employed to backfill the trench, and any surplus material will be used as berms along the access tracks or deposited in one of the designated storage locations. Cable ducts will have warning tape buried below the finished ground level. The retained topsoil will be used to reinstate vegetative cover immediately after the cables have been installed and the trench filled in.

Along the existing local roads cable ducting will be installed within the road structure itself. Cable ducting trenches will be approximately 600mm in width and up to approximately 900mm deep with the exception of the short section of local road leading from the wind farm substation to the R471. This section of road will also accommodate the 110kV export cable from the wind farm to the proposed Loop-in substation. The cable ducting trench along this section will be 2,000 mm in width and 900mm deep to avoid electrical conflicts in accordance with EirGrid Technical Specification requirements. The cable ducting will be placed into the prepared trench, inspected, and then the trench will be backfilled and the surface of the road reinstated.

The total length of the IPP cable route from the Eastern PDA to the Western PDA is approximately 10.6km. Cable ducting will be installed along this length in a trench 900mm deep by 600mm in width. Excavation of approximately 5,697m3 of surface material and subsoil will be required. Where suitable this will be required to backfill around the cable ducting with excess material removed from the construction areas and disposed of to a Licenced waste facility by a licensed waste contractor.

The cable ducting will cross watercourses at eight locations, as set out in Table 5.2. These will be crossed using the flatbed method of HH as outlined in Section 5.3 above.

During the construction period, traffic management measures will be put in place as set out in the Construction Management Plan for the Proposed Development.

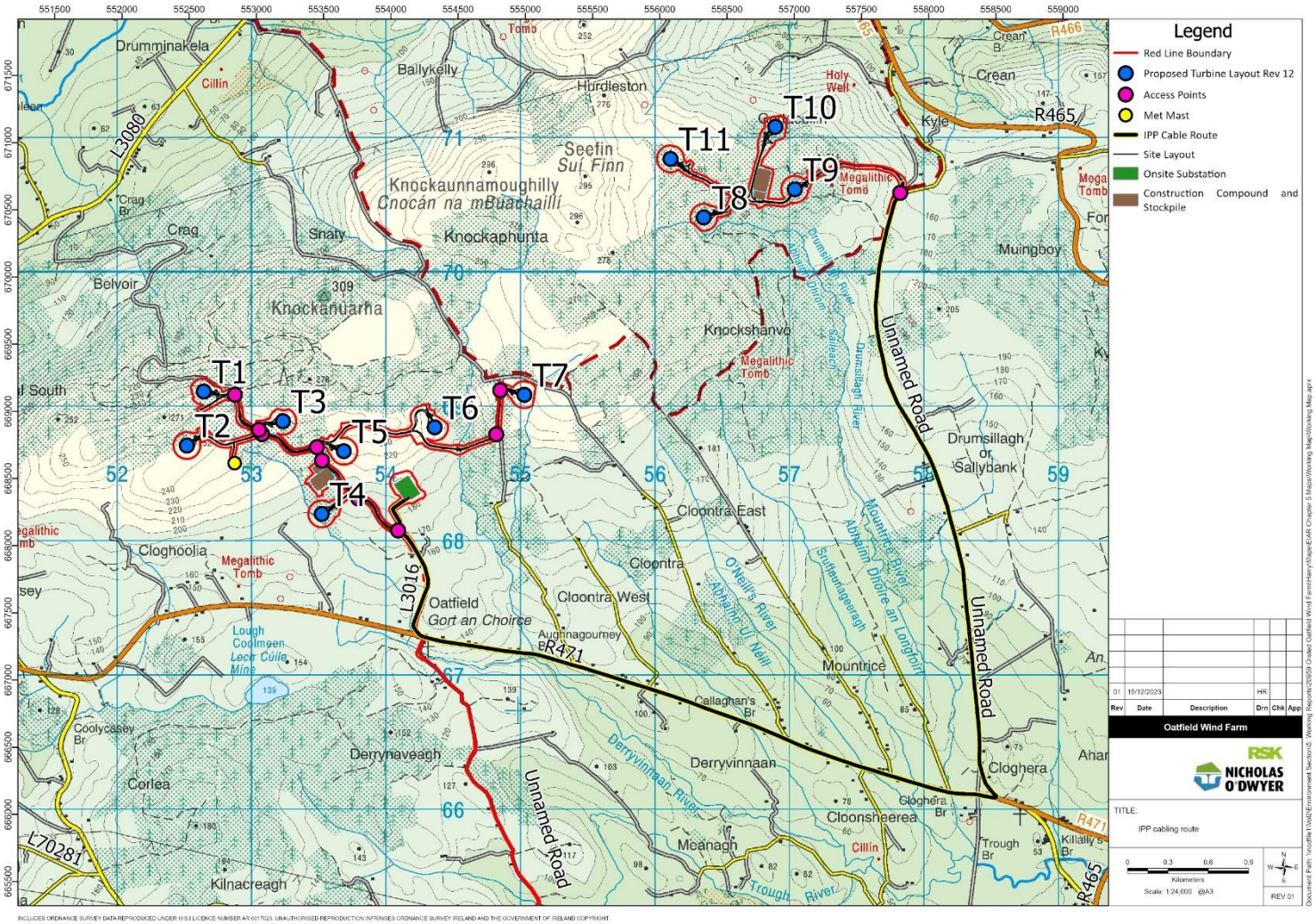


Figure 5.5: IPP cabling route

5.10 Substation

A 110kV substation will be located in the Western DA as shown on **Drawing No. 20959-NOD-XX-XX-00-DR-C-4210** and **20959-NOD-XX-XX-DR-C-42**. The electricity from the turbines (both the Eastern DA and Western DA) will be cabled into the substation where it will be transformed, metered, and regulated for export to the national electricity system. The substation will be connected to the proposed loop-in location at Ballycar via underground cable. The final layout and design of the substation will be to ESBN specifications within the parameters assessed in this EIAR.

The proposed substation contains the following:

- IPP control room;
- ESB control room;
- Switch room;
- Storeroom;
- Office;
- A water connection system supplied by rainwater harvesting with storage, to supply the proposed Water Closet (WC) and wash hand basin. Potable water will be supplied by bottled water;
- A WC with connection to a sealed wastewater holding tank fitted with a high-level alarm;
- Diesel tank and generator;
- Transformer bund and associated infrastructure (busbars, circuit breakers, cable supports and cabling);
- Lighting and fencing; and,
- Parking.

5.11 Permanent meteorological mast

For wind farms with an MEC exceeding 10MW it is a grid operator requirement (per EirGrid Grid Code PPM1.7.1.2 and ESB Networks Distribution Code DCC11.5.1.6) to have continuous on-site meteorological monitoring during operation. These signals are essential in providing high-quality forecasting now and into the future to maintain system security.

A 100m meteorological mast (met mast) is proposed at the Proposed Development site (in the Western DA) to supply continuous, real-time wind speed, wind direction, air temperature and air pressure data. The height of the proposed met mast will be agreed with ESBN / EirGrid during detailed design.

The proposed mast will be a free-standing lattice type structure as shown in **Drawing No. 20959-NOD-XX-XX-DR-C-08106**. It will be accessed via a short section of track from the internal access track. A turning head will be constructed adjacent to the mast site. The met mast access track will be 3.5m in width and will include associated drainage.

The met mast foundation will be 8m x 8m and the mast will be affixed to a concrete plinth with a depth of 1.5m. The plinth will be designed and constructed similarly to the turbine

foundations. It will encompass a cast-in insert or bolts to connect to the bottom of the met mast and reinforced bar structural elements. The area around and above the foundation will be backfilled with compacted crushed rock. The met mast will be linked to the closest turbine via buried internal cabling for power and communication.

5.12 Decommissioning

The proposed turbines will have a design lifetime of approximately 35 years. In certain circumstances, the operator may wish to replace turbines prior to the end of the design lifetime. Such a decision would be made following assessment by the operator and turbine supplier, in consultation with the local authority.

In the decommissioning phase, cranes will be used to disassemble each turbine section and they will be removed from the site. The upper sections of the foundations Projecting above ground will be removed, and the remainder of the foundations will be covered by soils typical of the surrounding environment and then reseeded or left to re-vegetate according to ecological requirements. Leaving the turbine foundations in situ is considered a more environmentally sensible option as to remove the reinforced concrete associated with each turbine would result in environmental nuisances such as noise and vibration and dust. Underground cables will be cut back at the turbine termination points and will be recycled. It is proposed that site access tracks will remain to allow access through the site for farm access, as considered appropriate at the time. Decommissioning the proposed development will take approximately 6 months to complete.

Site materials will be recycled where practicable or disposed of in accordance with waste legislation and best practice guidelines at the time of decommissioning.

As with construction, decommissioning works have could result in potential significant effects on identified sensitive receptors. Details of decommissioning will be agreed with the local authority prior to any decommissioning taking place. The potential for effects during the decommissioning phase of the proposed renewable energy development has been fully assessed in the EIAR.

A site-specific Decommissioning Management Plan will be prepared by the Developer for the approval of the Planning Authority before Decommissioning work can commence.

6 ENVIRONMENTAL POLICIES AND LEGAL REQUIREMENTS

All site works shall be undertaken in compliance with the CEMP and with all applicable legal and regulatory requirements.

6.1 Environmental Policies

As part of the appointment, the Contractor will provide a copy of their Safety and Environmental Policy. They will ensure that a copy of their Health, Safety and Environmental Policy is clearly displayed on site notice boards during the construction period. All employees will be required to comply with the requirements of the Environmental Policy.

The Contractor will ensure their employees and support staff (contractors, sub-contractors, suppliers etc.) actively promote and administer a strong environmental culture. To achieve this, a number of initiatives will be in operation during the life of the Project. This will include the use of poster campaigns to raise awareness of topical subjects, and toolbox talks involving all members of the Project team and site workforce.

6.2 Health and Safety Management

The Contractor shall be responsible for ensuring that the construction works Health and Safety Plan is implemented and followed on site. The works will be carried out in accordance with all relevant health and safety legislation and Codes of Practice and site rules relating to the works will be observed.

6.3 Legislation and other legal requirements

The Contractor shall comply as necessary with all relevant Statutory requirements such as the 2005 Safety Health and Welfare at Work Act (as amended, The Construction Regulations (SI 291 of 2013), the General Application Regulations (SI 299 of 2007), etc. (and any amendments thereof).

In addition, the Contractor shall comply with all the reasonable safety requirements of the Client, the Project Supervisor for the Design Process and the Project Supervisor for the Construction Stage.

A legislation register shall be held by the Contractor and reviewed periodically and updated as necessary. Any legislative changes shall be disseminated to Project management immediately, after which the method statements of any affected operations shall be changed accordingly.

A consents and licenses register shall also be held by the Contractor which will contain a schedule of all consent submissions and a tracker to confirm they are in place for the start of works. This will be tracked and managed by the Site Manager and confirmation and approved documentation will be sent to the HSEQ manager before works begin, when new consents are obtained, or when consent is withdrawn, or terminated.

7 ENVIRONMENTAL MANAGEMENT IMPLEMENTATION

7.1 Roles and Responsibilities

The appointed Contractor and all sub-contractors will be responsible for ensuring that the potential risks to the environment and local community are adequately avoided or controlled by the application of measures documented within this CEMP. These will be further developed in their amended CEMP and shall be complied with throughout the construction phase. The main organisations and persons involved in the construction stage works are set out below.

7.2 The Client

Orsted shall be responsible for:

- Securing the land including access required for all works;
- Appointment of the Contractor;
- Setting and communicating appropriate standards for environmental management and ensuring that their environmental policy is delivered; and,
- Review and approval of the CEMP.

7.3 Appointed Contractor

The Contractor shall be responsible for:

- Appointing a Site Manager / Site Supervisor.

7.4 Site Manager / Site Supervisor

The Site Manager shall be responsible for:

- Undertaking weekly Site Compound Checks, and appointing persons to supervise refuelling of tanks and bowsers;
- Ensuring the required consents are in place before work starts;
- Ensuring environmental and waste requirements are included on requisitions and in subcontracts and orders;
- Ensuring oil, including diesel is stored in properly bunded tanks / drip trays;
- Ensuring Waste Transfer Notes / Waste Consignment Notes are checked against invoices before payment;
- Liaising with statutory authorities as required and ensuring records of communication (including verbal communication) are kept. Statutory authorities should always be accompanied on site visits;
- Ensuring employees, contractors and subcontractors implement the controls set out in the CEMP;

- Ensuring employees, contractors and subcontractors receive Induction Training (including Project environmental issues) and Toolbox Talks, as appropriate;
- Ensuring personnel needed for audits are available when required;
- Verifying actions resulting from Corrective Action Requests and Observations raised during audits are completed by the deadlines;
- Ensuring environmental training is provided;
- Reporting incidents immediately, and to statutory authorities where required;
- Logging and monitoring incidents and non-conformances;
- Disseminating information, including changes to legislation, and relay to relevant contractor's employees;
- Identifying employees who require environmental training and maintain training records in line with the contract for the works;
- Providing advice and dealing with queries and correspondence on environmental issues;
- Identifying significant environmental impacts for the Project and assist in setting up contracts to include the necessary controls;
- Monitoring the progress in closing out Corrective Action Requests and Observations raised during audits;
- Ensuring all records are retained and readily available;
- Carrying out monthly site audits; and,
- Appointing any third-party specialists as required.

7.5 All Staff

All staff have responsibility for the environment, responsibilities include but are not limited to:

- In the case of an incident, stopping work, implementing control procedures and reporting it to the Site Manager;
- Contacting the Waste Representative when waste needs collecting;
- Passing any queries or correspondence on public health or environmental issues to the Site Manager; and,
- Working in accordance with environmental procedures, the CEMP and Method Statements.
- Working in accordance with instructions issued by the Ecological Clerk of Works and/or the Environmental Clerk of Works.

7.6 The Community Liaison Officer

The Community Liaison Officer shall be responsible for:

- Responding to telephone and email queries within 48 hours of receipt;

- Sharing key contact information associated with site development with key stakeholders and update these details as required;
- As a general courtesy, alerting the community to any disruptive works one week in advance of commencement, where reasonably practicable;
- Minimising the impact of site traffic and associated parking on the local road network;
- Arranging any necessary meetings that may be requested by community representatives regarding any on-site issues; and,
- Circulating updates as required on the Projects progress to include information of relevance and interest to the local community.

7.7 Environmental / Ecological Clerk of Works

An Ecological Clerk of Works (ECoW) will be appointed to address issues relating to ecological features during the construction and decommissioning phases, as described within the CEMP. Their responsibilities will include:

- Undertaking a pre-construction survey to ensure that significant effects to ecological features will be avoided;
- Inform and educate site personnel of sensitive ecological features within the Project site and how effects on these features could occur;
- Oversee management of ecological issues during the construction and decommissioning period and advise on ecological issues as they arise;
- Provide guidance to contractors to ensure legal compliance with respect to protected habitats and species on site; and
- Liaise with officers from consenting authorities and other relevant bodies and contractors with regular updates in relation to construction and/or decommissioning progress.

7.8 Ecological Clerk of Works (ECoW)

The Contractor will implement the mitigation measures as set out in the EIAR Chapter 7 on Biodiversity, EIAR Chapter 8 Birds and in the NIS prepared in respect of the Development.

The Contractor will adhere to the instructions of the appointed Ecological Clerk of Works (ECoW) for the Development.

The appointed ECoW will have responsibility for monitoring activities that have the potential to impact on ecology or biodiversity associated with the site or linked to the site arising from site construction activities.

The ECoW will ensure that all the mitigation measures set out in Chapter 7 Biodiversity and in the Natura Impact Statement are being fully implemented.

The appointed ECoW will have the authority to issue Stop Work Orders until such time that issues which may impact on ecology or biodiversity are resolved.

8 ENVIRONMENTAL MANAGEMENT OF SITE ACTIVITIES

8.1 Best Practice Guidance

The Contractor will adhere to best practice guidance and requirements as detailed below, particularly the

- CIRIA guidance document C532 Control of water pollution from construction sites and
- the EU Construction and Demolition Waste Management Protocol – BIBM and
- IEMA's latest Impact Assessment Guidance, 'A New Perspective on Land and Soil in Environmental Impact Assessment' (Feb 2022)
- Machinery Directive. See Guide to application of the Machinery Directive 2006/42/EC Edition 2.2 – October 2019 (Update of 2nd Edition)

The construction approach will also adhere to the requirements set out in the Inland Fisheries Ireland guidance document Requirements for the Protection of Fisheries Habitat during Construction and Development Works and Development Sites.

- PPG 1: Understanding your environmental responsibilities - good environmental practices. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/485211/LIT_1404.pdf
- GPP 2: Above ground oil storage tanks. https://www.netregs.org.uk/media/1899/guidance-for-pollution-prevention-3-2022-update-v2.pdf
- PPG 3: Use and design of oil separators in surface water drainage systems. https://www.netregs.org.uk/media/1899/guidance-for-pollution-prevention-3-2022-update-v2.pdf
- GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer. https://www.netregs.org.uk/media/1887/guidance-for-pollution-prevention-4-2022-update.pdf
- GPP 5: Works and maintenance in or near water. https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf
- PPG 6: Working at construction and demolition sites Pollution Prevention Guidelines. https://www.netregs.org.uk/media/1672/ppg-6.pdf
- PPG 7: Safe storage - The safe operation of refuelling facilities. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/485206/pmho0711btzl-e-e.pdf
- GPP 8: Safe storage and disposal of used oils. https://www.netregs.org.uk/media/1900/guidance-for-pollution-prevention-8-2022-update.pdf

- GPP 19: Vehicles: Service and Repair. https://www.netregs.org.uk/media/1417/gpp-19-vehicles-sevice-and-repair-no-e.pdf
- GPP 21: Pollution incident response planning. https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/gpp-21-pollution-incident-response-planning/
- GPP 22: Dealing with spills.

  https://www.netregs.org.uk/media/1643/gpp-22-dealing-with-spills.pdf
- GPP 26 Safe storage - drums and intermediate bulk containers. https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/gpp-26-safe-storage-drums-and-intermediate-bulk-containers/
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8.2 Construction Phase Prevention of Pollution

The appointed Contractor(s) will implement at a minimum all of the Mitigation Measures as set out in the following Chapters of the EIAR and NIS prepared for the Proposed Development's Construction:

- Chapter 6 Population and Human Health
- Chapter 7 Biodiversity
- Chapter 8 Birds
- Chapter 9 Hydrology and Hydrogeology
- Chapter 10 Land, Soils and Geology
- Chapter 11 material Assets
- Chapter 12 Shadow Flicker
- Chapter 13 Noise &Vibration
- Chapter 14 Landscape and Visual
- Chapter 15 Archaeology, Architecture & Cultural Heritage
- Chapter 16 Traffic and Transport
- Chapter 17 Air Quality
- Chapter 18 Climate

A Summary Table of Mitigation Measures is provided in **EIAR Chapter 21: Summary of Mitigation Measures.**

The summary table will be reviewed and updated with additional mitigation measures to suit the needs of this CEMP, should these be required during the construction phase.

8.3 Hydrology and Drainage Management

Site drainage and drainage management and control is set out in Chapter 9 of the EIAR.

The Project Hydrologist/Design Engineer will attend the site during the Construction Phase to ensure that the drainage design and drainage controls are constructed in accordance with the detailed drawings and mitigation measures set out in Chapter 9.

A Surface Water Management Plan has been prepared for Development, see in **Appendix C** of this CEMP The Contractor will implement in full the requirements of the Surface Water Management Plan provided.

8.4 Resource Waste Management

To ensure effective control of waste arising from the development construction activities and to minimise waste generation and final disposal requirements the Contractor will adhere to the requirements of the Resource Waste Management Plan for the Site which is provided in **Appendix D**.

The Resource Waste Management Plan sets out the principles and approach to waste Management and must be fully adhered to by the Contractor(s) and all subcontractors appointed to construct the Development.

8.5 Horizontal Directional Drilling (HDD) drilling

All chemical fluids used in the boring process are to be inert to the environment (environmentally safe) and follow the relevant legislation. The Contractor is to retain a chemical register and have Safety Data Sheet (SDS) documents available onsite during the operation. The Contractor will also be responsible for a Fluid Management procedure which should include:

- Drilling Fluid program and MSDS
- Management of spoil including volume on site, specialised site storage
- Management of drilling fluid displacement (expected volumes and proposed storage)

Considering the high volumes, high flow rates and high contaminant content (drilling spoil) of water arising for drilling activities, water will be managed and treated by means of a settlement tank and/or associated infrastructure.

If a separation (recycling) system is to be used it must be adequately sized and bunded to handle the through-put of the drilling fluid so continuous drilling and reaming operation can be maintained. A separation system must be complete with screens and hydro - cyclones to separate the solids from liquid. Drilling fluids and drill spoils will be disposed off-site at an approved licensed location or discharged to the local surround area with approved licencing permits.

All equipment used during HDD will be in good working order, checked regularly and maintained when necessary. Fluid return lines used in HDD process should be tested for leaks prior to use to check their reliability. Plant machinery not in use is required to have drip trays below engines as well as at refuelling points, if necessary.

All practices involving bentonite will be monitored closely, that is: pumping pressure, drilling mud formulation i.e., drilling fluid volume and the volume of mud returns.

Fuels, lubricants and hydraulic fluids for equipment use on Site will be carefully handled to avoid spillage, properly secured and provided with spill containment kits in case of incident to ensure best practice.

Spill kits, hydrocarbon mats, oil booms etc., will be maintained at areas of works for emergency use and replaced when necessary.

8.6 Traffic Management

A Construction Traffic Management Plan (CTMP) has been prepared for the Project and is presented in **Appendix 5.2 of EIAR Chapter 5: Project Description**.

9 MONITORING & ENVIRONMENTAL CLERK

To ensure effective implementation of mitigation measures, environmental auditing, and monitoring of environmental obligations of the Developer, an Environmental Clerk of Works (EnvCoW) will be assigned by the Developer to carry out monitoring at the Site during the construction and operational phases of the Development.

The EnvCoW role will be to actively and continuously monitor site conditions and advise on environmental issues and monitoring compliance, and will not be responsible for implementing measures. The duty of implementing measures will be held by the Developer / contracted construction operator.

The EnvCoW will have the authority to temporarily stop works in a particular area of the site to ensure corrective measures are implemented and adverse environmental impacts are minimised if not avoided.

Monitoring of pollution prevention and mitigation undertaken by the EnvCoW assigned by the Developer will include:

- Monitoring site pollution prevention plan.
- Water quality monitoring.
- Advising on required pollution prevention measures (as described in this EIAR) and monitoring their effectiveness.
- Liaison with local authorities in relation to pollution instances if applicable.
- Considering EnvCoW will be responsible for monitoring a broad range of environmental factors at the Site, technical monitoring and advice will be sought such as from specialist consultants as the need arises e.g., installation and website for telemetry.

A detailed Water Quality Management Plan (WQMP) has been prepared and is attached as **Appendix A** to this CEMP.

The requirements of the WQMP and any updates will be fully implemented by the Contractor(s) engaged to construct the Development.

10 COMMUNICATION

10.1 Internal Communication

Environmental mitigation measures shall be incorporated into the Risk Assessments and Method Statements (RAMS) prepared by all contractors working on the site. All RAMS shall be communicated to the workforce by the Site Manager.

Weekly construction meetings shall be held during the construction phase. These meetings shall include health, safety and environmental matters such as

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

Any issues resulting from daily or weekly audits shall be discussed with appropriate corrective actions agreed. A 'weekly look ahead' shall be provided at the construction meeting where any environmental constraints or special requirements can be discussed and agreed in advance, where required.

The Site Manager shall conduct daily construction briefings, as required, to ensure site personnel are advised of any specific environmental requirements and constraints.

Toolbox talks will be scheduled as and when necessary, over the duration of the Project.

The Contractor will directly and promptly communicate any environmental issues with the relevant body/department via phone or email.

Site notice boards will display the Environmental Policy of the Client, emergency contacts list, relevant statutory and non-statutory advice and guidance; and any other relevant information. These environmental notice boards will be situated in prominent positions including the main reception area of the site office / compound.

10.2 External Communication

Prior to works commencing on site a Stakeholder Communications Plan will be developed and implemented. This may comprise of circulating information leaflets or similar to inform local residents or residents' associations of each phase of the development with particular emphasis on safety, traffic management and the control of noise and dust throughout the construction period. Communications will take place at a minimum 2-weeks in advance of the works commencement for each construction phase. The contractor will promote and aim to maintain excellent relationships with adjacent local residents, businesses, occupiers and the general public through regular communication and updates on construction activities that may affect them.

All communications received by the Contractor that are relevant to the works in site, including enquiries and complaints, shall be passed to the Site Manager.

If required by the Client any relevant contractors shall attend community engagement events, meetings, etc details of which shall be communicated to stakeholders in advance.

The Site Manager shall serve as the point of contact for the regulatory authorities for their specific activities. Communications from the regulatory authorities received at the site by the Site Manager shall be immediately reported to the Client.

The Contractor shall maintain a record of all communications.

Through the induction all members of the workforce shall be made aware that any direct approaches from members of the public should be directed to their Site Manager. The Site Manager shall record all approaches made by members of the public and shall advise the Client's Project Team of all comments received at the worksite from members of the public.

10.3 Public Liaison

The Contractor will establish early community relations with the surrounding residents and local community. All local residents and where relevant businesses shall be notified in advance of works commencing on site.

A Community Liaison Officer will be appointed for the duration of the Project and will be responsible for complaint management, public consultation and liaison with the public.

The Community Liaison Officer will manage any complaints from the community in a fair and efficient manner and share key information associated with site development such as potential disruptive works as and when necessary.

10.4 Complaints Procedure

The Contractor shall put in place a system for recording, and responding to, all complaints received from third parties. The system shall include the timely reporting of all such complaints.

As a minimum the activity leading to the complaint will be stopped immediately; or where not possible to entirely stop the activity reduce it to the lowest possible level e.g., shut off all non-essential plant.

All complaints will be acknowledged by the Contractor or Project Team on receipt and assessed to determine what information is required from all parties in order to formulate a response. The complainant will be called on the same day if a phone number is provided. Where a phone number is not provided an email response shall be given within three days. All complaints shall be recorded and investigated.

The Contractor will ensure that the complaints log is made available to the local authority if requested.

10.5 Documentation

The Site Manager 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. This CEMP shall be a controlled document and authorised latest version shall be signed and dated by the responsible person[s]. Other site data records and environmental management documentation would include, but not necessarily be limited to the following:

- Copies of relevant consents, permissions, or other approvals/ authorisations;
- Environmental data records including monitoring results, waste transfer notes/ records of waste collection and treatment/disposal;
- Records of any environmental incidents including actions taken and resolution;
- Records of complaints 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 issued by the local authority or any 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; and,
- Records of staff training including site inductions and toolbox talks.

11 ENVIRONMENTAL TRAINING AND AWARENESS

11.1 Inductions

All Project personnel and sub-contractors shall receive an Environmental Induction Presentation, prior to commencement of works onsite. No personnel, including sub-contractors, shall be permitted to commence employment on site without prior attendance at an induction.

Environmental topics covered in the induction shall include but will not be limited to:

- Water resources;
- Pollution prevention;
- Emergency response procedures;
- Waste management and housekeeping;
- Management structure;
- Duties and responsibilities;
- Relevant procedures;
- Ecologically sensitive areas;
- Incident reporting;
- Consents and licenses;
- Legislation; and,
- Environmental best practice.

11.2 Toolbox Talks

Regular 'Tool-Box Talks' on specialised topics shall supplement the induction course. Toolbox talks shall be used to highlight issues of concern and to disseminate new information not previously provided. They will also offer site personnel with the opportunity to provide feedback.

Tool-Box Talks shall include, but will not be limited to, instances where:

- There is a change to existing legislation, which requires an operational change;
- Site inspections or audits have identified corrective actions which require rolling out;
- Work is being undertaken in environmentally sensitive areas;
- There are significant changes in environmental conditions, i.e., heavy rainfall.

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

Toolbox talk topics for environmental management shall include, but will not be limited to:

- Control of noise and dust emissions.
- Environmental incident and reporting.
- Silt and water management.
- Waste management and segregation.

Records of all 'Tool-Box Talks' and attendance shall be kept in the site offices.

11.3 Specialist training

Specialist training for specific members of the construction crews will be provided as required. This may include, but will not be limited to:

- Emergency environmental crews.
- Environmental Monitoring.
- Waste representatives.
- Fuel tanker drivers and refuelling activities.
- HDD crew related to breakout of drilling fluids.

12 EMERGENCY PREPAREDNESS AND EMERGENCY RESPONSE

An Emergency Response Plan has been prepared for the Development and is attached to this CEMP as **Appendix E**.

Prior to commencement of construction, the Environmental Clerk of Works will prepare a register of corrective action and emergency response sub-contractors that can be called upon in the event of an environmental incident, and/or to give training on escalating incident where useful, including e.g. specialist hydrocarbon spill response, specialist hydrological and/or water quality response.

Mitigation measures as outlined in the previous sections will reduce the potential for contamination of waters during the construction phase of the proposed development. However, there remains the risk of accidental spillages and or leaks of contaminants, and excessive loading of surface water mitigation infrastructure.

The Emergency Response Plan Potential emergencies and respective emergency responses include:

- Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the proposed development. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.
- Significant hydrocarbon spill or leak – In the event of a significant hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons and contaminated runoff will be contained, managed and pumped to a controlled area in line with Active Management including treatment through a suitably equipped treatment tank and Granular Activate Carbon (GAC) vessels. This process will be managed by the Ecological Clerk of Works (ECoW) in conjunction with a preidentified consultant (Ecological Clerk of Works (ECoW) specialist register) in regard to effective remediation, treatment and removal of hydrocarbon contaminated water and soils Excavation and appropriate disposal of contaminated soils will be required in this instance.
- If a significant hydrocarbon spillage does occur, the contractor on behalf of the developer will have an approved and certified clean-up consultancy available on 24-hour notice to contain and clean-up the spill. The faster the containment or clean-up starts, the greater the success rate, the lower the damage caused and the lower the cost for the clean-up.
- Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example a spill kit will be established and mobilised as

part of the turbine erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand.

- In the event of a significant contamination or polluting incident the relevant authorities will be informed immediately.

The Emergency Response Plan sets out the requirements with respect to the following:

- Managing & Reporting Environmental Incidents
- Roles and Responsibilities
- HDD break out
- Spill Kits
- Fire Prevention
- Extreme Weather
- Emergency Contacts
- Incident Reporting and Investigation
- Incident Response

The Emergency Response Plan is to be considered a live document which is to be updated on a regular basis by the Site Manager.

13 COMPLIANCE AND AUDITING

13.1 Development Works Area Inspections

13.1.1 Site Inspections and Environmental Audits

The ECoW and the Site Construction Manager will carry out routine inspections of construction activities.

Site inspections will be carried out on a daily and weekly basis at locations which are relevant to the construction activities taking place on site to ensure all controls are in place and are functioning to prevent pollution events occurring.

Inspections carried out will ensure that the activities taking place are in compliance with the mitigation set out in the EIAR, the NIS and in compliance with this CEMP and all other planning application documents.

Inspections will be carried out by suitably trained staff only.

A log of all inspections shall be maintained on site by the ECoW and made available for inspection by the Local Authority on request.

Any identified failures or potential failures in pollution control measures will be logged as well as any corrective actions taken.

13.1.2 Auditing

The purpose of Environmental Audits is to identify and to highlight the underlying causes of non-compliance. Good environmental audits will result in system and performance improvement.

A schedule of environmental audits will take place during the construction phase will be set up and agreed with the Planning Authority prior to commencement of construction.

The Environmental Audits will be carried out by contractor staff or alternatively by external personnel acting on their behalf.

The results of environmental audits will be documented and provided to Project management personnel.

Corrective Actions, if required will be identified and agreed with the Contractor together with the time frame for their implementation.

13.1.3 Environmental Compliance

Identified incidents will be classified as Near Miss, Minor or Major in accordance with Table 13.1.

Table 13.1Incident Reporting and Investigation

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. • a minor fuel spill below 20 litres onto ground which is immediately cleared; • a minor spill of a chemical not classified as presenting an ecotoxic risk; • exceeding noise levels; • silt runoff from site which does not enter into a surface water feature; or • excess dust emissions.
Major Environmental Incident	Incidents that have caused or may cause significant harm or damage to the environment e.g. • a minor fuel spill which impacts a sensitive land feature, a water body, or drains; • a major fuel spillage over 20 litres; • any spillage of a chemical which is classified as presenting an ecotoxic risk; • silt runoff from site which enters a water feature; or • receipt of a nuisance complaint.

An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary.

Where Minor or Major incidents occur, Corrective Action will be taken immediately, an assessment of the impact arising from the activity will be made and recorded by the ECoW, a report generated on the issue, action taken, and effectiveness of the corrective action taken.

The Corrective Action Report will be made available to the Planning Authority or other Statutory Body on request.

The appropriate Corrective Action will be implemented by the Site Supervisor/Construction Manager, as advised by the Site Environmental Clerk of Works.

A Corrective Action Notice will be issued to the Main Contractor and will include the details of the incident and the action required to be taken.

The Corrective Action Notice will include a section to be completed when the actions required are completed.

This CEMP will be updated and reviewed prior to commencement of construction, and also every six months thereafter during the construction phase of the Project or when triggered by the need to do so due to an environmental incident, on foot of a complaint

or new legislative requirements which lead to a change in mitigation or management practices on site.

Orsted Onshore Ireland Midco Limited

Proposed Oatfield Wind Farm

Construction Environmental Management Plan

Appendix A Surface Water Management Plan

604569 SWMP

DECEMBER 2023

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1 INTRODUCTION

This Surface Water Management Plan (SWMP) forms part of the Construction Environmental Management Plan (CEMP) for the Oatfield Wind Farm Project (the Proposed Development) in Co. Clare.

The SWMP sets out the minimum surface water management requirements which must be implemented during the:

- Construction of the Development
- Operation of the Development
- Decommissioning of the Development

The SWMP should be considered a live document and is to be updated by the Contractor at the commencement of the Project and on a quarterly basis thereafter, or as more frequently as the need arises to ensure that it is current and has the most up to date information.

A copy of the SWMP and any updates shall be maintained on site as part of the Environmental Clerk of Works (EnvCoW's) Environmental Management System.

An electronic copy of the ERP and any updates shall be provided to the following:

- Oatfield Wind Farm
- Clare County Council Planning Department
- Inland Fisheries Ireland
- Contractor
- All sub contractors working on the project.

The EnvCoW shall maintain a record of all versions of the SWMP issued.

2 PROJECT DESCRIPTION

Site Location and Plan

The site of the Proposed Development is located in the Oatfield and Gortacullin areas. At the nearest point, the Proposed Development site is approximately 1.3km to the South of Broadford, 4.7km to the East of Sixmilebridge in East Clare, 7.6km North of Ardnacrusha, approximately 9.2km North of Limerick, and 19.7km South of Ennis.

The Proposed Development site boundary (which is the planning boundary) includes:

Two distinct areas; the Western Development Area (Western DA) (approximately 153 hectares) and the Eastern DA, (approximately 139 hectares) comprising of a total land area of approximately 296 hectares which principally consists of conifer plantation, transitional woodland scrub, mixed forest, pastures, agricultural lands, and peat lands. Refer to Figure 1.

IPP connection route from the Eastern DA to the 110kV substation located in the Western DA: The IPP cables will be installed within the body of the local public road network and in the public access trackway near the Western DA. The IPP connection route is illustrated in Figure 1 also. The overall length of this interconnecting IPP cable route is approximately 10.6km.

Electrical energy generated from the wind farm will be exported from the proposed 110kV Substation located in the Western DA to the national grid via underground double circuit grid connection cables to the existing overhead 110kV lines at Ballycar North, County Clare. Two options for the interconnection with the Overhead line are proposed. Option A is a Loop in to the existing Ardnacrusha – Ennis 110kV Overhead line at Ballycar North and Option B is a Loop in to the existing Ardnacrusha – Drumline 110kV Overhead line also at Ballycar North. Once it leaves the Proposed Development site, the 3.9km grid connection infrastructure will be installed within the body of the public road network along the route illustrated in Figure 1.

An area of land take required for accommodation works along the proposed turbine delivery route from Foynes Port to the Proposed Development Areas site (see Section 5.2.8.4 of Chapter 5: Description of the Proposed Development for further details).

- The application is seeking a 10-year planning permission and 35-year turbine operational period from the date of overall commissioning of the entire wind farm.
- The construction of the Project in its entirety is expected to take approximately 18 months. This will be confirmed in the Updated CEMP when the Contractor is appointed.

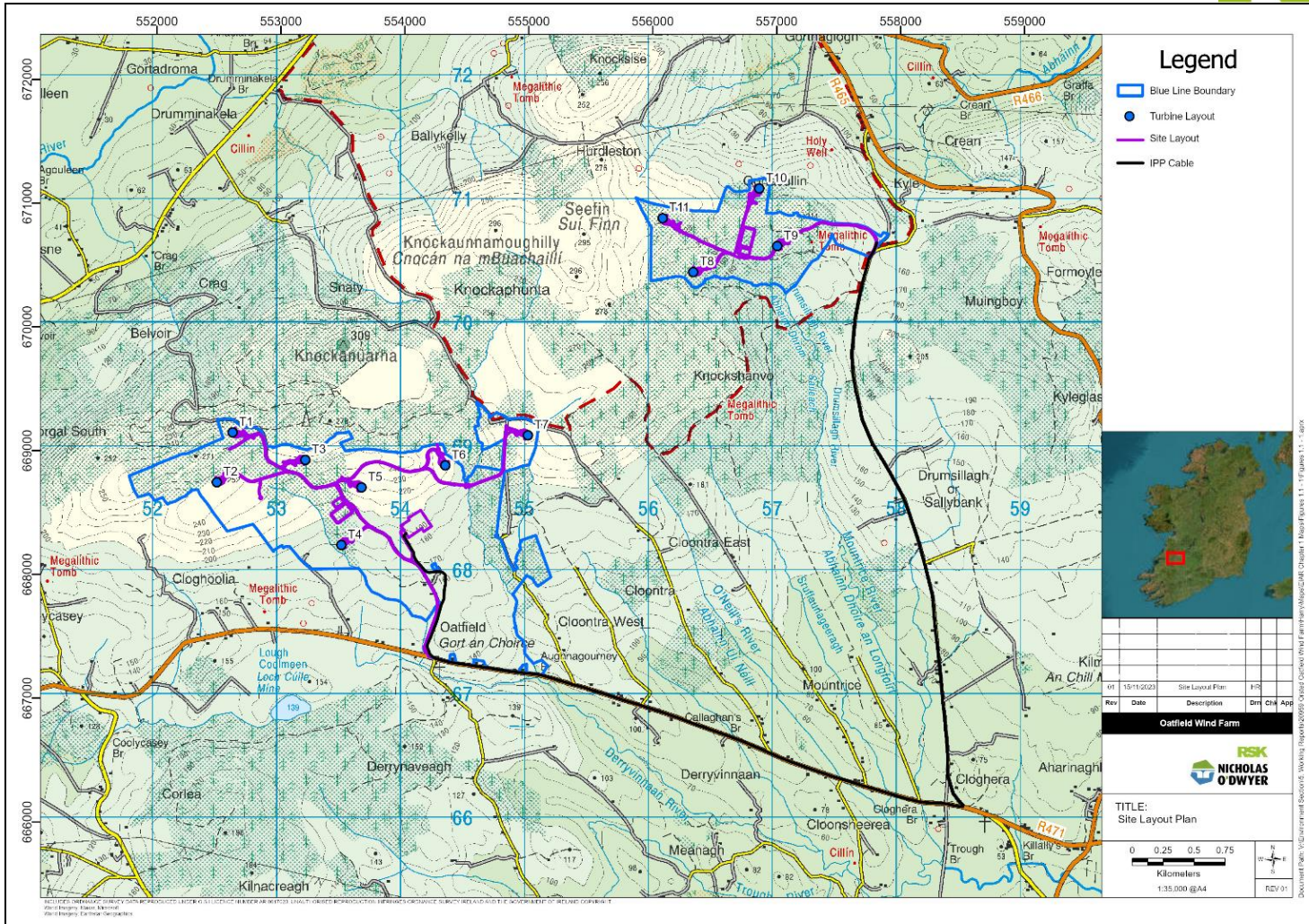


Figure 1: Proposed Development Site Location Map (Site in two parts; Western and Eastern Portions)

3 MONITORING, ENVIRONMENTAL CLERK AND EMERGENCY RESPONSE PROTOCOLS

Environmental Clerk of Work

To ensure effective implementation of mitigation measures, environmental auditing, and monitoring of environmental obligations of the Developer, an Environmental Clerk of Works (EnvCoW) will be assigned by the Developer to carry out monitoring at the Site during the construction and operational phases of the Development.

The EnvCoW role and monitoring schedule is outlined in the Water Quality Monitoring Plan (WQMP).

Managing & Reporting Environmental Incidents

Environmental incidents including accidental spillages on soils (e.g. fuel), breeches of thresholds (environmental quality standards – TSS exceeding 25mg/l), and significant environmental incidents will be reported to the Local Authority as part of emergency responses to such incidents. Incident notification will be escalated to relevant third parties where relevant e.g. Inland Fisheries Ireland (IFI) if surface water receptors are intercepted.

Emergency Response Protocols

Mitigation will set out to minimise any potential for contaminants to reach sensitive receptors identified during the construction phase of the proposed development are encompassed in passive management of construction water, however, there remains the risk of accidental spillages and or leaks of contaminants, and excessive loading of surface water mitigation infrastructure.

EnvCoW will monitor the efficacy of mitigation measures applied, and were failing to achieve the objectives set, emergency response and mitigation measures are escalated until such time as the site stabilises and objectives of mitigation are being achieved once more.

Details of these protocols are outlined in the WQMP.

4 ENVIRONMENTAL CONSTRAINTS AND MITIGATION MEASURES

The descriptive mitigation measures outlined in this report (**Section 5 & 6)** will be applied to the development design and construction methodologies with a view to avoiding and/or minimising any potential adverse effects to water quality in the receiving surface water network. The aims and examples of important considerations in relation to mitigation measures described in the EIAR are further clarified here.

The available guidance stipulates varying surface water buffer widths depending on type of activity, receptor type and sensitivity, and riparian zone characteristics including topography (steepness). Recommended surface water buffer widths range from 5m to 50m depending on site specific and activity specific characteristics. For the purposes of this assessment the following conservative approach has been applied:

- 50m Surface Water Buffer Zone - Mapped surface water features i.e., mapped streams, rivers, lakes. Source for mapped surface water features; EPA.
- 15m Drainage Buffer Zone - Non-mapped drainage features i.e., non-mapped streams, natural and artificial drainage features, except where the area is crossed at track locations. Source for non-mapped surface water features desk study and aerial photography assessment, Lidar topographic data and field observations. With exceptions where the area is crossed at track locations.

Figure 2.1 to Figure 2.3 and Figure 3.1 and Figure 3.2 present identified historic surface water features (screening 25" maps, GeoHive). Some of these features are obsolete / no longer exist. Active historic drains

Significant drainage features have been identified and mapped in so far as practical. Such drainage features, while not mapped or prescribed buffer zones in the guidance, will be treated with the same consideration as mapped drainage during the design and construction phase of the development i.e., mitigating for the potential for drainage connection to receiving surface water network.

Groundwater buffer zones are dependent on the characteristics of the receptor e.g., private well, or public supply source protection zone, and the characteristics of the underlying geology and associated aquifer e.g., poor unproductive aquifer, or regionally important karstified aquifer. Recommended groundwater buffer zones range from e.g., 15m (exclusion zone karst swallow holes) to entire catchments (source protection in regionally important karstified aquifer) depending on site specific characteristics. For the purpose of this assessment the following conservative approach on the buffer distances has been applied:

- 100m Groundwater Buffer Zone – Groundwater abstraction points in relation to proposed access tracks and cable trenches i.e., shallow excavation. Source for mapped abstraction points: GSI. Applicable to the Site, Grid Connection and Turbine Delivery Routes
- 250m Groundwater Buffer Zone – Groundwater abstraction points in relation to foundations, proposed access tracks and cable trenches. Source for mapped abstraction points: GSI. Not applicable, none within 250m of the site.

- 15m Surface Karst Feature Buffer Zone e.g., swallow holes. No karst features identified on Site, depressions, sink holes, swallow holes etc.
- Source Protection Areas – The entire area mapped as a public or group groundwater supply protection area. Source: EPA. This is not applicable.
- Entire Catchment (Karst aquifer) – The entire catchment associated with a public or groundwater supply protection area which is underlain with a karstified aquifer. This will be assessed in detail as . Not applicable.

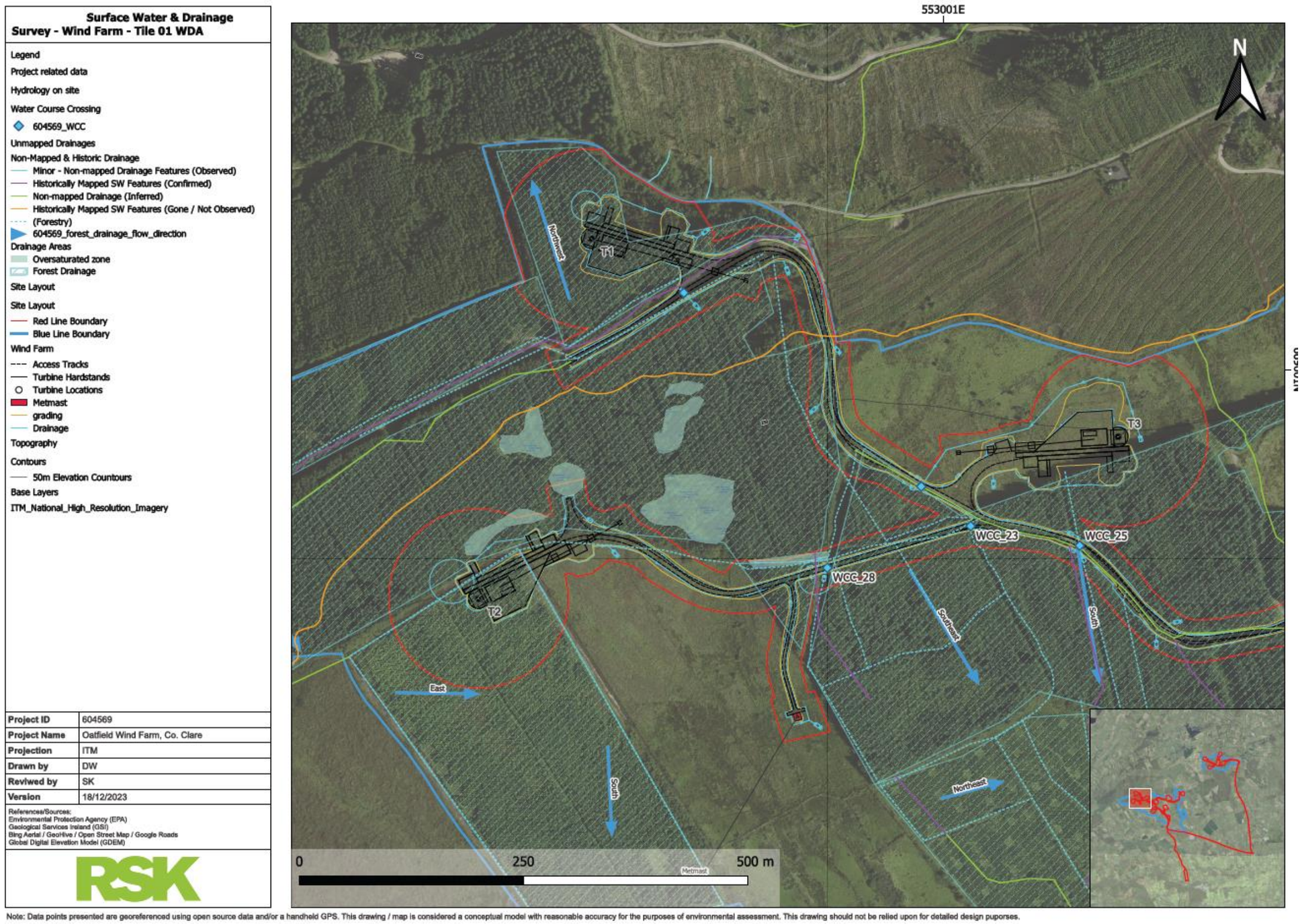
None of the proposed works fall within a buffer zone associated with an EPA mapped river. The proposed turbine delivery routes associated widening where required, at watercourse crossings etc. naturally fall within buffer zones associated with mapped streams / rivers. Some of the proposed turbine hardstands, and site access tracks fall within buffer zones associated with existing natural and constructed drainage features at various locations (**Figure 4**). These features pose an elevated risk in terms of connectivity to surface water receptors downstream.

Following site surveys significant natural and artificial drainage features observed which are relatively well connected to the mapped surface water network and/or regional groundwater bodies have been included in considering constraints. Given the extensive drainage network existing at the site the construction activities associated with the development will invariably be in close proximity to surface water / drainage features, including within the buffer zones such that there will be a requirement for further enhancing and specifying mitigation measures.

Some of the development footprint will fall within buffer zones due to the unique and limiting circumstances associated with the site and the development. Careful consideration and special attention to planning is required for the identified locations within the surface water buffer zones. Each proposed construction location will possess unique characteristics and will require assessment on a case-by-case basis to ensure adequate measures are implemented. Method statements and the proposed design of any road crossings will also require agreement from Inland Fisheries Ireland (IFI) in advance of construction which invariably must be constructed within the buffer zones. The mitigation measures described in the following sections will also be applied.

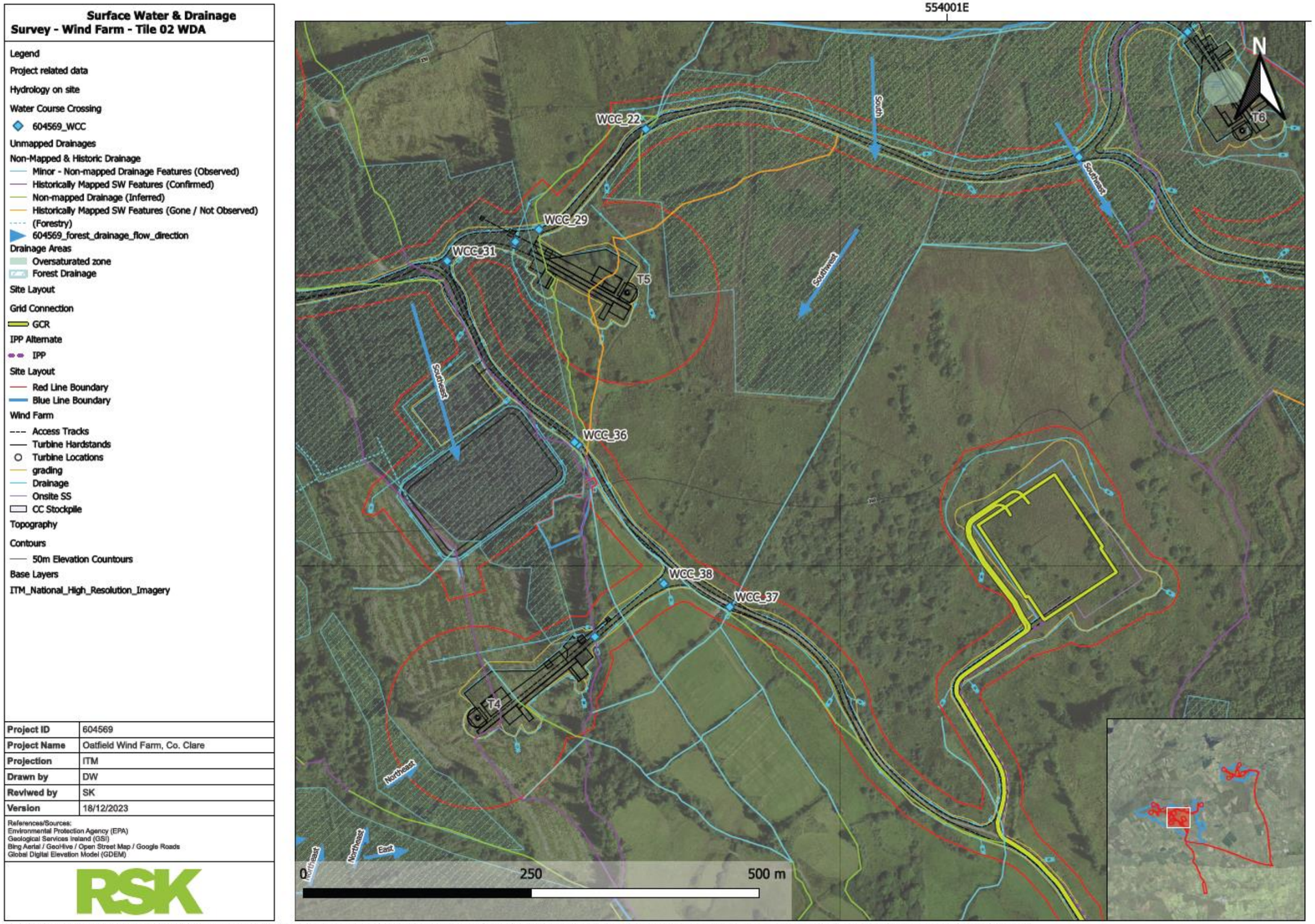
Some portions of the Development footprint fall within assigned buffer areas, including;

- One new Surface Water Crossing i.e., bridge, and associated access track and infrastructure is within a surface water 50m buffer.
- Forty-one new Surface Water Crossings i.e., culverts, and associated access track and infrastructure is within a surface water 15m buffer.
- Some sections of access track and Turbine Hardstands are within a drainage water 15m buffer.
- Cut and Fill around T4 falls within the 50m buffer of a mapped river; Blackwater (Clare), however it is kept out of the minimum requirement of 25m buffer.



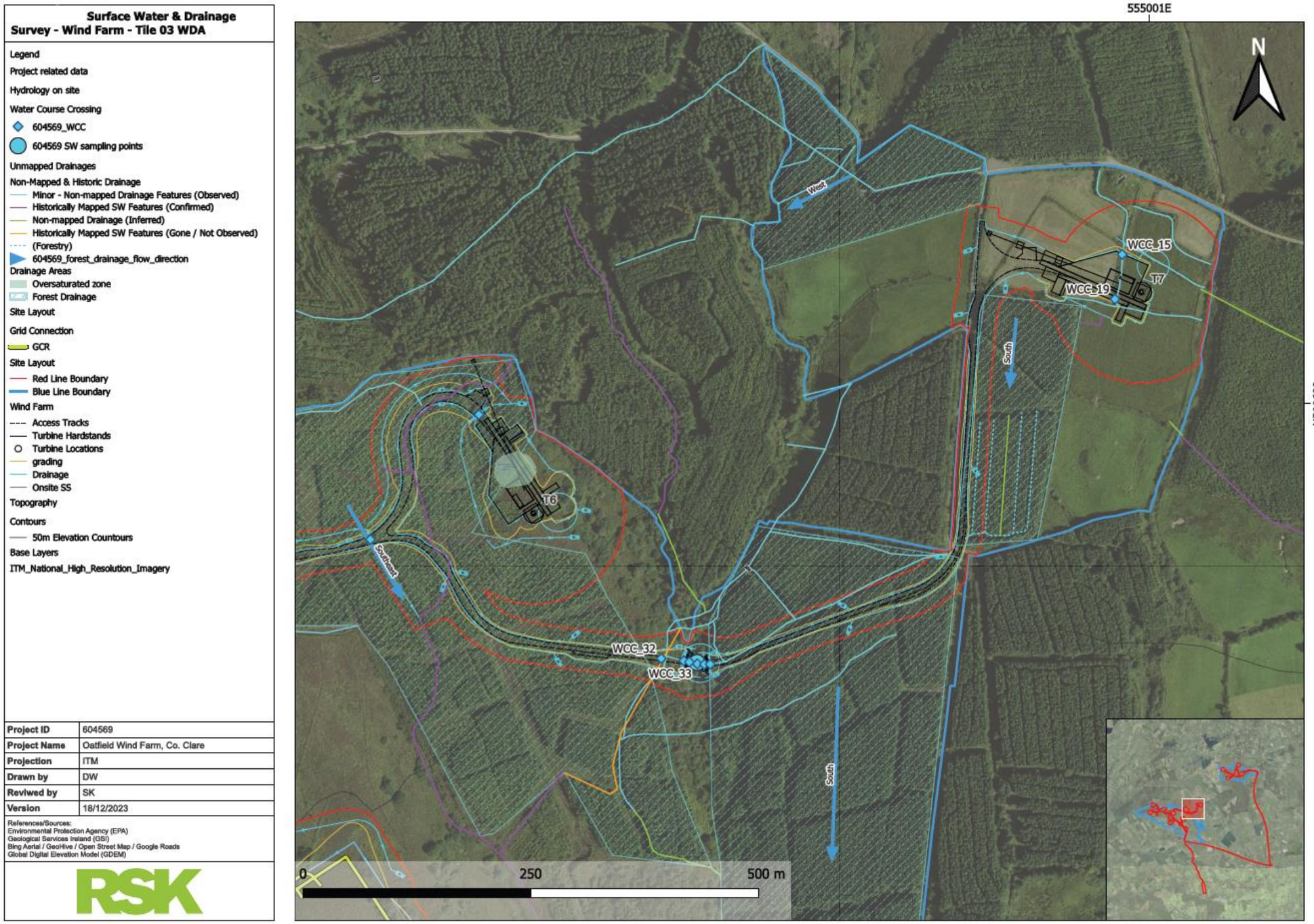
Note: Data points presented are georeferenced using open source data and/or a handheld GPS. This drawing / map is considered a conceptual model with reasonable accuracy for the purposes of environmental assessment. This drawing should not be relied upon for detailed design puporses.

Figure 2.1: Mapped drainage of the Western DA tile 1



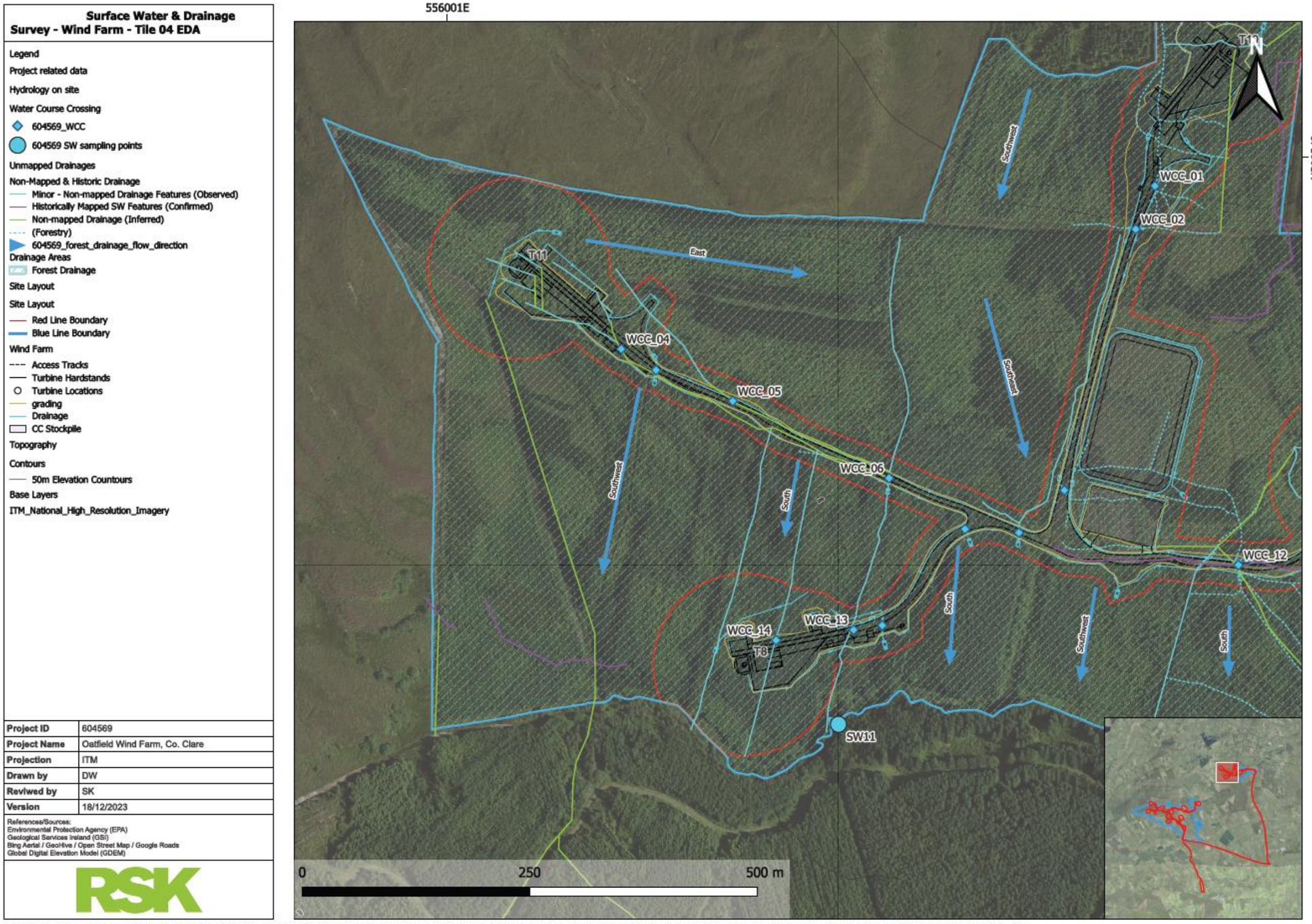
Note: Data points presented are georeferenced using open source data and/or a handheld GPS. This drawing / map is considered a conceptual model with reasonable accuracy for the purposes of environmental assessment. This drawing should not be relied upon for detailed design puporses.

Figure 2.2: Mapped drainage of the Western DA tile 2



Note: Data points presented are georeferenced using open source data and/or a handheld GPS. This drawing / map is considered a conceptual model with reasonable accuracy for the purposes of environmental assessment. This drawing should not be relied upon for detailed design puporses.

Figure 2.3: Mapped drainage of the Western DA tile 3



Note: Data points presented are georeferenced using open source data and/or a handheld GPS. This drawing / map is considered a conceptual model with reasonable accuracy for the purposes of environmental assessment. This drawing should not be relied upon for detailed design puporses.

Figure 3.1: Mapped drainage of the Eastern DA tile 4

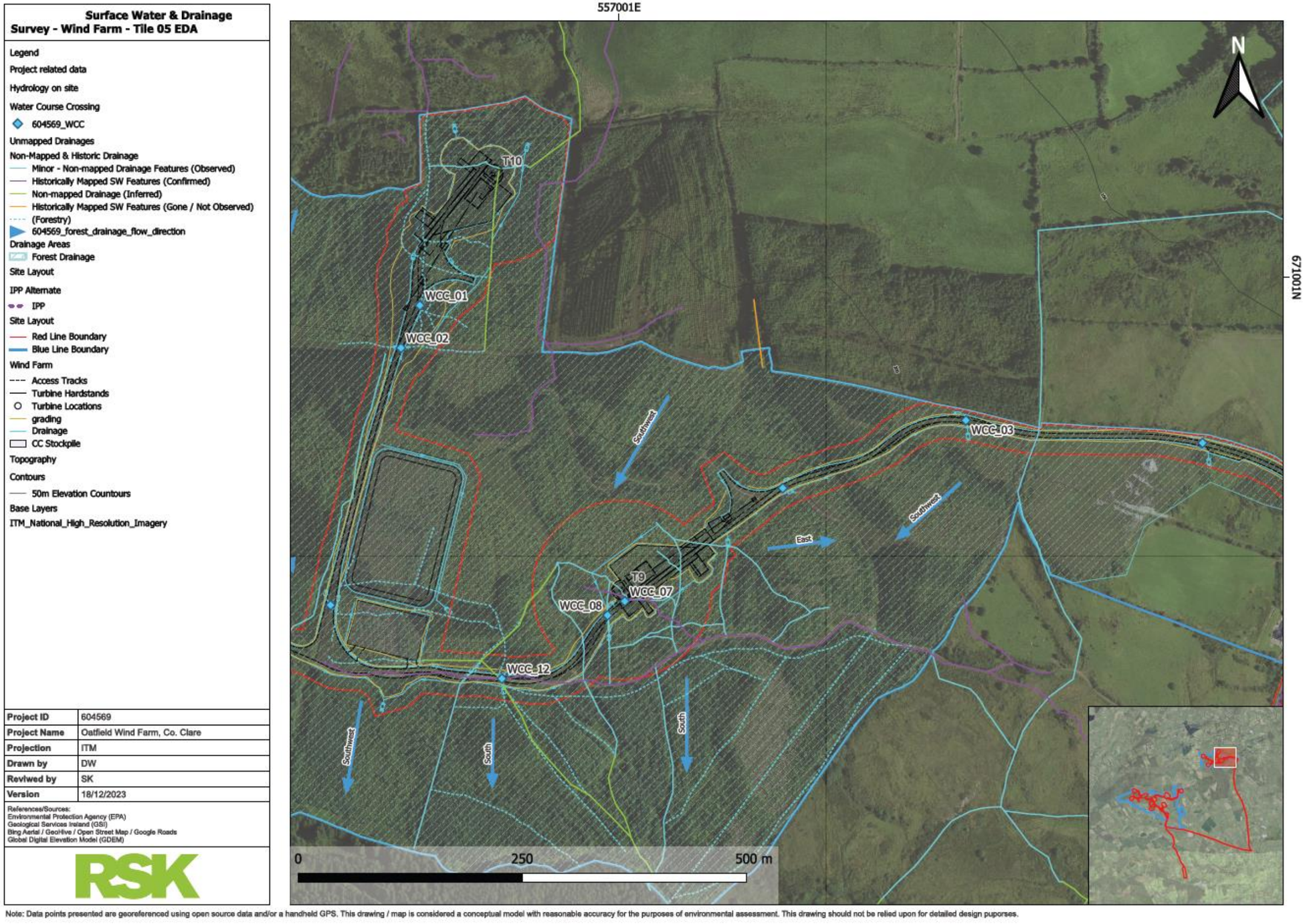


Figure 3.2: Mapped drainage of the eastern DA tile 5

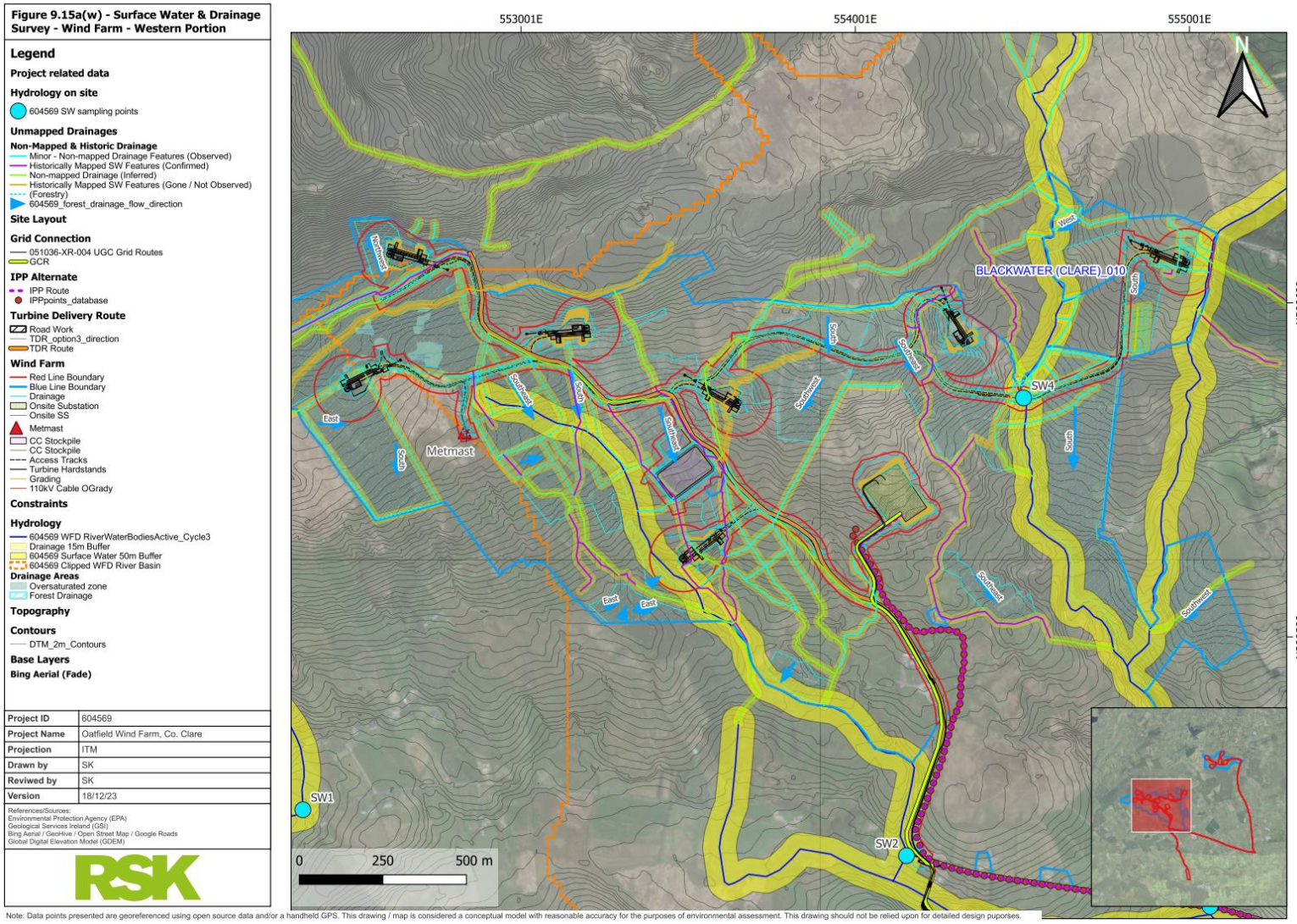


Figure 4a: Development Constraints Map – WF Western Portion

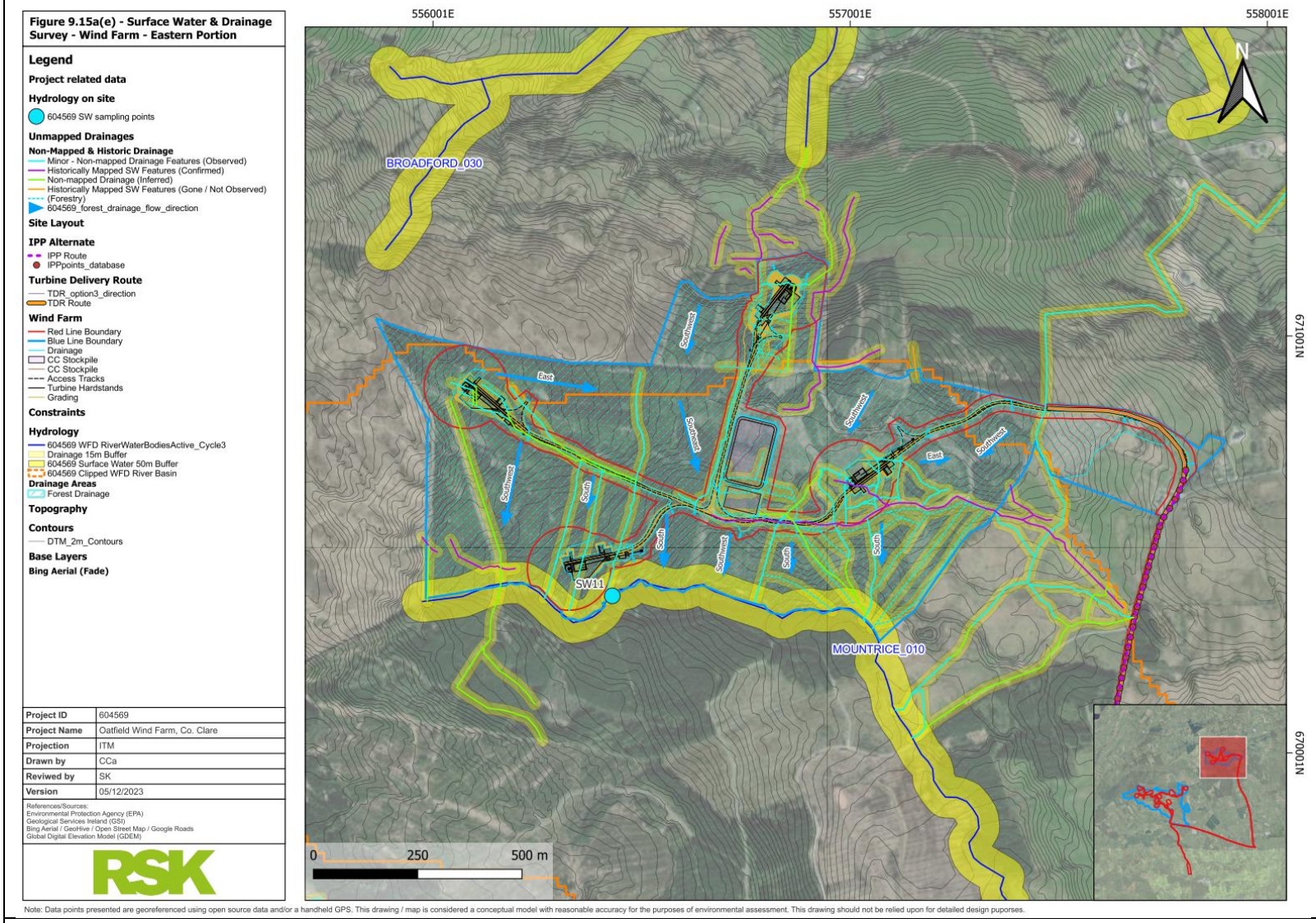


Figure 4b: Development Constraints Map – WF Eastern Portion

5 DRAINAGE SYSTEM OVERVIEW

The drainage system has been designed for this Development, considering all constraints outlined in **Section 4**. It aims to ensure the Development does not change the baseline water quality within or downstream of the Site. The drainage system includes the following:

- A 50m buffer from watercourses except at water crossings. These will be marked out prior to works beginning on site.
- Drainage will be installed in parallel with road construction.
- Check dams will be mainly used for road drainage. All road sections will drain to settlement-attenuation ponds.
- Silt fencing will be utilised during water crossings and around stockpiles
- Settlement-attenuation ponds will be used at every major excavation

SuDS Drainage Design

Drainage features constructed at a site as part of the wind farm development have the potential to significantly adversely effect on the baseline hydrological regime, particularly in areas in close proximity to existing drainage features. .

As part of mitigation by avoidance during the design phase of the development, groundwater, surface water, and drainage buffer zones were established where applicable, excluding areas crossed at track locations. Buffer zones are intended to drive the design process by minimising or avoiding the risk to surface water features by restricting construction disturbance to outside these zones, in turn protecting riparian vegetation and providing potential for filtering of runoff from the site and maintaining the baseline hydrological and drainage regime at the site.

Where drainage networks exist, collected / diverted runoff will likely be diverted back into the existing network. In such instances, it is important to include the existing drainage network in designing and specify the treatment train and attenuation features, including improving, modifying, and constructing attenuation features in drainage channels. Similar considerations for newly constructed drainage channels, the modification and/or improvements of existing drainage will be designed with a view to maintaining or improving the hydrological regime at the site.

The drainage design for the proposed site will be such that drains are positioned adjacent to the footprint of the development, therefore the proposed drainage infrastructure can be considered part of the development footprint.

Site surveys identified significant natural and artificial drainage features which are connected to the mapped surface water network and/or regional groundwater bodies ,these are outlined as constraints in **Section 4** and **Figure 2, Figure 4.** The construction activities associated with the development will invariably be in close proximity to surface

water / drainage features, including within the buffer zones such that they will be subject to further enhancement and specific mitigation measures.

There is increased potential for water pollution in these areas, in particular sedimentation to local surface water features due to the excavation and generation of spoil and emplacement of stone materials during the construction stage of the project. To ensure this is reduced and mitigated for Sustainable Drainage Systems (SuDS) will be implemented.

The design criteria for the SuDS design are as follows:

- To select and install ecologically sensitive drainage.
- To minimise alterations to the ambient site hydrology and hydrogeology.
- To provide settlement and treatment controls as close to the site footprint as possible and to replicate the existing hydrological environment of the site.
- To minimise sediment loads resulting from the development run-off during the construction phase.
- To preserve greenfield runoff rates and volumes.
- To provide settlement ponds to encourage sedimentation and storm water runoff settlement.
- To reduce stormwater runoff velocities throughout the site to prevent scouring and encourage settlement of sediment locally.
- To manage the problems of erosion and allow for the effective revegetation of bare surfaces.
- To control water within the site and allow for the discharge of runoff from the site within the limits prescribed in the Salmonid Regulations.

The purpose of incorporating a SuDS design is:

- To provide sufficient detail to ensure that water pollution will not occur as a result of construction activities at the site and to minimise the risk of any such occurrence.
- To regulate the rate of surface water run-off downslope to prevent scouring and to encourage settlement of sediment locally.
- To provide appropriate retention times such that no flooding will occur.
- To provide settlement ponds to encourage sedimentation and storm water runoff settlement.

6 DETAILED DESIGN CONSIDERATIONS

Nature based solutions couple SuDS with ecology and biodiversity mitigation can also provide opportunities to attain net biodiversity gain.

One of the main objectives of Nature Based Solutions and SuDS is to create an array of runoff stilling areas / standing water and promote diffuse discharge and recharge of runoff at the proposed site. The objective of nature-based solutions will be to reverse the effect of the development where there is the opportunity and where it is appropriate through surveying and risk assessment.

SuDS Design Principles

The approach to treatment and attenuation of storm water is as follows:

- Additional drainage measures will only be added as necessary. The dimensions of these features will avoid intercepting large volumes of water. Any changes to the SWMP must be agreed with the Environmental Manager and the EnvCoW.
- Surface water runoff from the proposed Site Access Tracks will be managed with crossfall downslope to mimic the natural drainage patterns of the Site.
- Drainage vegetation (vegetation including grasses established within a drainage channel can filter runoff water. Living and decomposing plants and roots and associated microorganisms trap sediments and take up excess nutrients used, will be similar in species to the local area and will be approved by the Environmental Clerk of Works.
- Temporary erosion protection together with silt fences may be required (**Figure 5**).
- Roads will be constructed from aggregate and will not be surfaced with geotextile materials, thus allowing for permeation and helping to reduce runoff volumes. Therefore, a reduced runoff coefficient of 65% is applicable. For hardstands, an open textured stone will be used as these will only be functional during construction of the specific turbine, a higher permeability is envisaged and the run-off co-efficient is reduced to 50%.
- An additional 20% rainfall will be included to allow for a possible increase in rainfall intensity due to climate change.
- Stormwater runoff within the trackside drainage will be treated through the provision of check dams, within a range depending on local slope of the drain as significant levels of sediment are not expected because of the surface

dressing of the roads (**Figure 6**). All trackside drainage will drain to settlement-attenuation ponds (**Figure 7**).

- Discharging directly back into the surrounding area will assist in maintaining the hydrological characteristics of the Site.
- Where vegetation is removed from sloped areas during construction, these areas will be reinstated as early as possible using the same vegetation or similar vegetation as advised by the EnvCoW.
- A sump may be required for trench dewatering. Water will subsequently be pumped into settlement-attenuation ponds or a siltbuster.
- The level of silt runoff during construction will be monitored which is detailed in **Chapter 9: Hydrology and Hydrogeology** and if found to be excessive of 25 mg/L in any area, will subsequently be managed by the provision of additional silt attenuation features such as silt fences or silt traps.

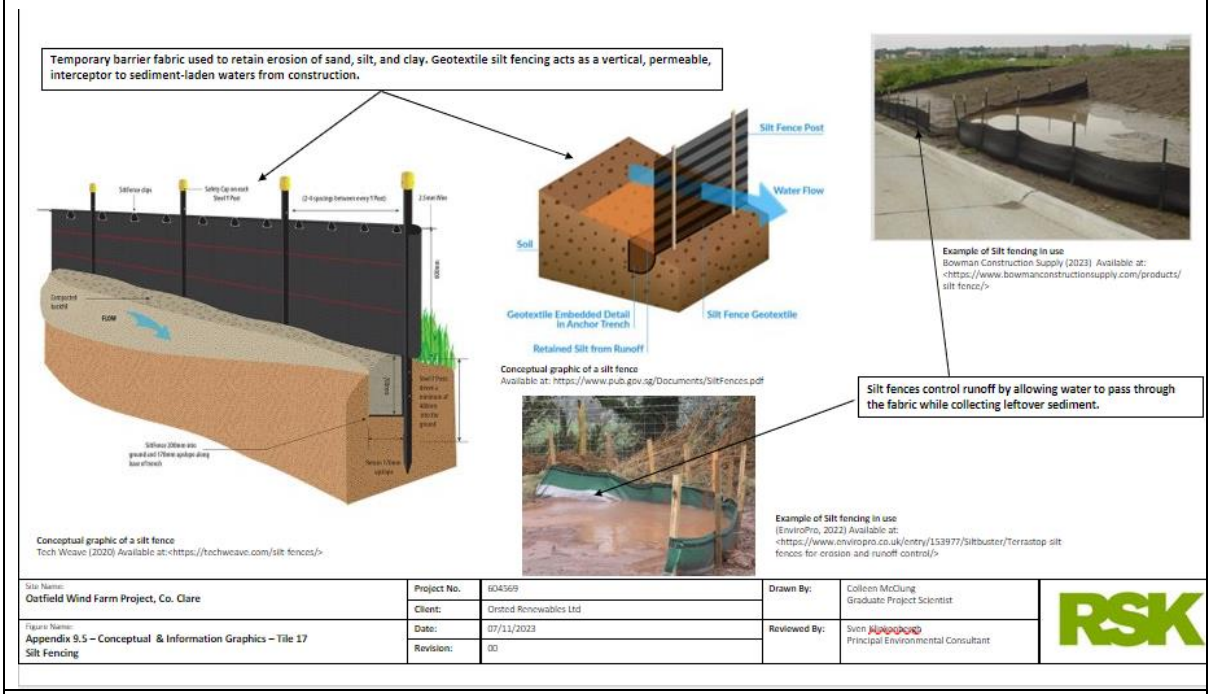


Figure 5: Silt Screen system

This system involves the installation of some semi-permeable geotextile fabric (**Figure 5**), vertically held on simple timber posts, and is used primarily as an additional means of filtering out sediments from run-off water used in conjunction with other drainage and attenuation measures. The fences can be installed (to manufacturers' recommendations) in a range of scenarios, including;

- Alongside any sensitive areas, e.g. watercourses, particularly where works occur within drainage or surface water buffers. This can include dirty water containment at watercourse crossings.

- Large areas of stripped materials i.e. soils and subsoils, and areas used for temporary storage of materials.
- Downstream from drainage or water treatment outlets, and can usually be arranged in a horse-shoe style configuration to contain and allow settlement of suspended sediments.
- Within temporary construction drains, alongside or in place of check dams.

Silt fencing works through ponding. It allows runoff water to gather, and for sediment to sink while the water itself slowly soaks into the ground or evaporates. These systems require ongoing monitoring and maintenance.

Silt Fencing is considered a temporary mitigation measure and will be removed once conditions stabilise following the construction phase of the development.

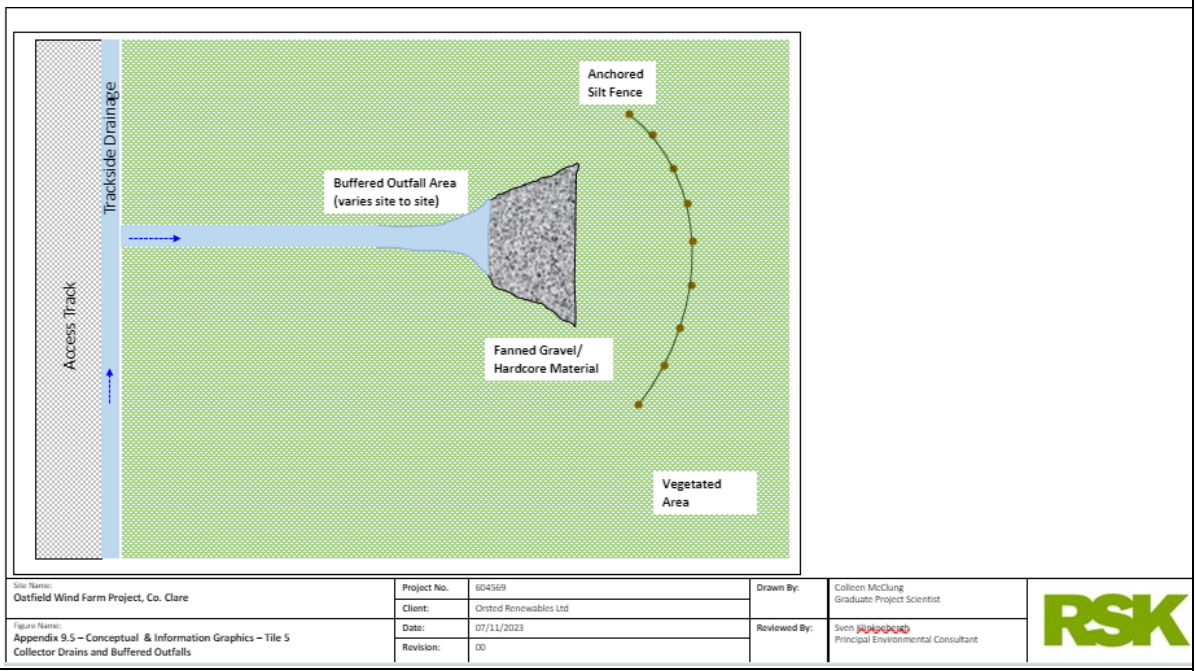


Figure 6: Collector Drains & Buffered Outfalls

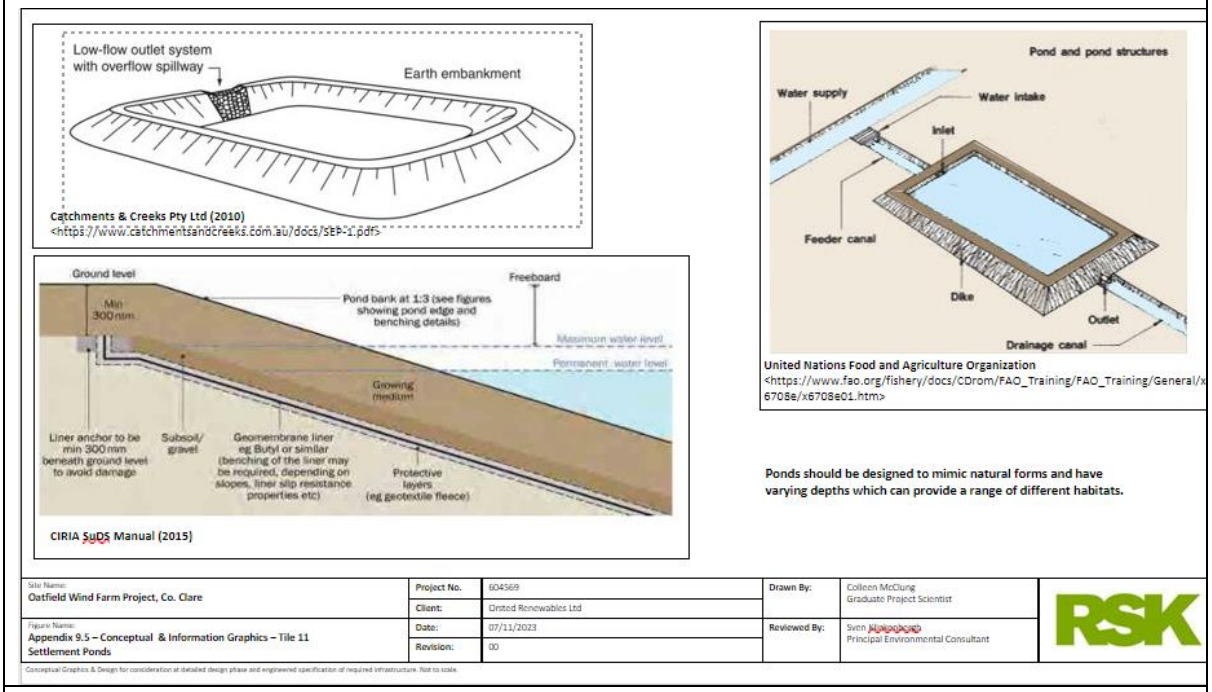


Figure 7: Settlement Ponds

Active Management Treatment Plans

In all instances where construction water, or runoff has the potential to entrain solids during excavation and other construction activities, runoff will be contained by means of temporary berms (lined geotextile of similar), bunds (lined) and sumps. This will be referred to as dewatering. Construction water (contaminated) will be pumped to the treatment train (Figure 8).

Pre-excavation, the following activities would be completed; felling of required trees and remove required vegetation from the site, including grass, shrubs, and bushes. Stockpile vegetation in a designated area for later removal or use in the restoration of the site. Remove the topsoil to the required depth to prepare the area for construction. Stockpile the topsoil in a designated area for later use in the restoration of the site. Remove the subsoil to the required depth to prepare the area for construction.

Contaminated water arising from construction works, namely, excavations, drilling and temporary stockpiling, will be contained and treated prior to release or discharge. The schematic presented here is a conceptual model of measures implemented to manage arisings and runoff (**Figure 9**).

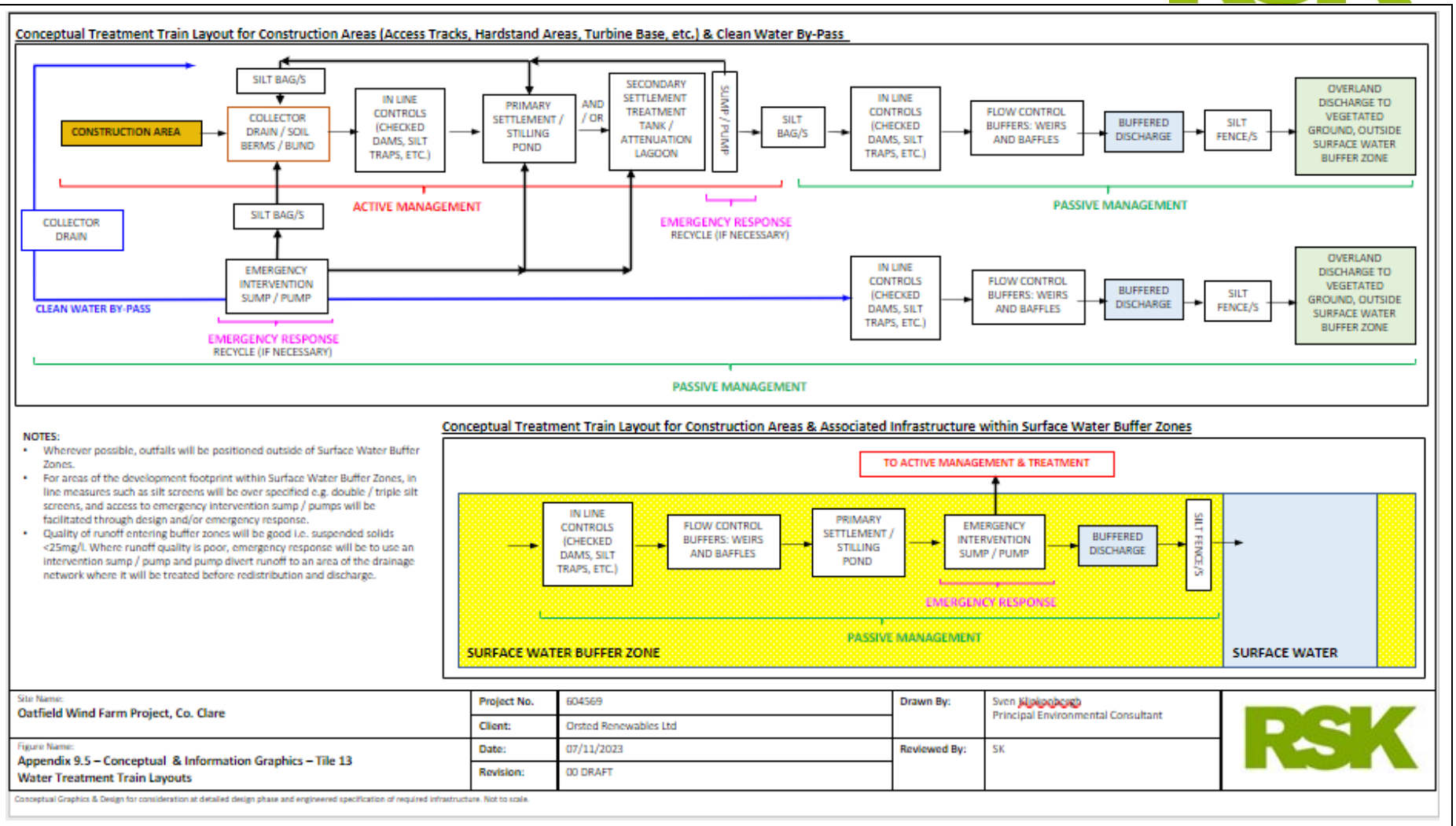


Figure 8: Passive and Active Treatment train flow Diagram

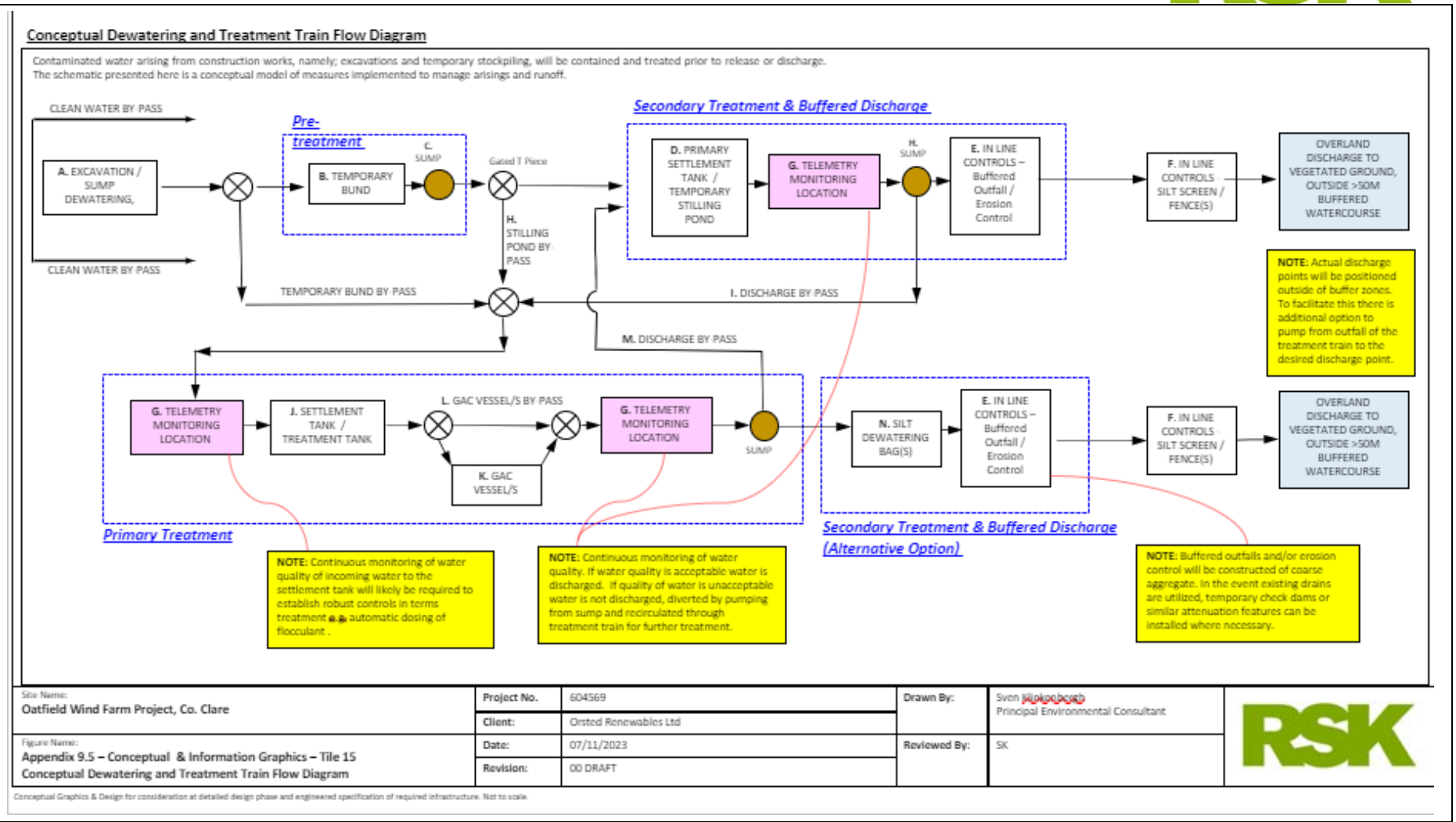


Figure 9: Treatment train flow Diagram

Active Treatment Train of Construction Waters

The following sets out the Active Treatment train for construction waters:

- Arisings. Arisings from the launch / reception pit, or any other significant excavation (e.g., cable joint bays), will be directed to the treatment train.
- Temporary Bund. Arising control area i.e., a temporary bund. Gross solids will be temporarily deposited here. Water arising with the material will be allowed to drain to sump.
- Sump / Pump. Sump will discharge by gravity / pumped to stilling pond.
- Temporary Stilling Pond. This can be constructed using soils for bunding in combination with an impermeable liner.
- Outfall. The outfall from the stilling pond will be buffered (coarse aggregate) to dissipate energy and diffuse discharging water.
- Silt Screen. A silt screen will be in place down gradient of the stilling pond outfall. This is a precautionary measure to mitigate peak loads or surcharges in the system.
- Monitoring Location/s. Discharge quality will be monitored in real time using telemetry systems. Monitoring of discharge quality will be carried out at the outfall of the stilling pond i.e., before being actually discharged to surface vegetation or surface water (licenced).
- Sump / Pump. Discharge By-Pass. If water discharging from the stilling pond exceeds quality reference limits water will be diverted (pumped) from the stilling pond to the settlement / treatment tank.
- Stilling Pond By-Pass. Similar to Discharge By-Pass, if conditions dictate water can be diverted directly to settlement / treatment tank.
- Settlement / Treatment Tank. A settlement tank will in line and ready to use if required i.e., water quality at stilling pond outfall fails to meet quality reference limits. The tank will be equipped with treatment systems which will be activated as the need arises, for example, very fine particles which are very slow to settle can be treated with a flocculant agent to promote settlement of particles.
- GAC Vessel/s. As a precautionary measure, GAC (Granulated Activated Carbon) vessel/s will be in line and ready to use if required. GAC vessels are used to filter out low concentrations of hydrocarbons. Significant hydrocarbon contamination is only envisaged under accidental circumstances. If a hydrocarbon spill does occur, normal operations will pause and the treatment train will be utilised to remediate captured contaminated runoff.
- GAC Vessel By-Pass. If the quality of the water is acceptable in terms of hydrocarbon contamination.

- Treated water will be discharge by gravity / pump to the stilling pond for additional clarification, monitoring and buffered discharge to vegetated area.
- Silt Bag. A silt bag can be used as alternative to stilling ponds. However, silt bags must only be used as primary method in lower risk areas i.e., outside of buffer zones, etc. Stilling ponds will be the primary method (D, N) is circumstances where risk is elevated, however a gate vale and silt bag can be included in the treatment train and used as an emergency discharge route in the event that the stilling pond needs remediation or maintenance.

In all instances, stilling ponds (D), silt bags (N) and outfalls (E) will be situated outside of surface water buffer zones. At many locations, works will be within buffer zones. In these instances, waters can be pumped to the treatment train which can be positioned upgradient along the road (grid connection route) where discharge to vegetated areas / roadside drains can be managed.

Discharge of non-contaminated storm runoff to vegetated land within the Site boundary is not a licenced activity however this methodology is possible only under relatively low flow conditions (e.g., <2 litres per second (l/sec) typical of runoff over a relatively small site area. In the event that the expected incoming flow rate or dewatering rate is relatively high (>2 l/sec) a discharge licence will be acquired.

The discharge points will be identified during the licence application process. As discussed previously, the main components of the treatment will be positioned outside of the 50m surface water buffer zone where possible. The developer will identify suitable locations for the establishment of temporary infrastructure considering other variable such as traffic and access management. Similarly, the preferred location of discharge points will be outside of buffer zones and into minor or non-mapped surface water / drainage features where possible. The subject drain will be inspected to ensure connection to the mapped network (not blocked).

The quality of the water being discharged will be monitored. If discharge water quality is poor (e.g., >25mg/l Toal Suspended Solids) additional measures will be implemented, for example, pausing works as required and treating construction water by dosing with coagulant to enhance the settlement of finer solids – this can be done in a controlled manner by means of a suitably equipped settlement tank, **Figure 10**. Collected and treated construction water will be discharged by gravity / pump to a vegetated area of ground within the site, (**Figure 5).** Silt fences will be established at the discharge area to ensure potential residual suspended solids are attenuated and the potential for erosion is reduced, (**Figure 6**). The discharge area will be outside of buffered areas (similar to dewatering of excavations. The quality of water discharged will be in line with licence discharge limits assigned by the local authority and will be monitored in real time (telemetry with 15 min sampling rate), as well as laboratory samples taken, analysed and reported and the frequency indicated in the licence.

Figure 10: Bunding for Hazardous Materials

7 POST CONSTRUCTION DRAINAGE MANAGEMENT

Following the completion of construction, a full review of construction stage temporary drainage will be undertaken by the appointed Contractor (in conjunction with the Environmental Manager, Site Engineer and the Project EnvCoW), with a view to removing drainage infrastructure that is no longer required during the development's operation phase

Orsted

Oatfield Wind Farm

Construction Environmental Management Plan

Appendix B - Spoil Management Plan

604569

DECEMBER 2023

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1. INTRODUCTION

The Oatfield Wind Farm is located in the Oatfield and Gortacullin areas, approximately 1.3 km to the South of Broadford, 4.7 km to the East of Sixmilebridge in East Clare, 7.6 km North of Ardnacrusha, 9.2 km North of Limerick, and 19.7 km South of Ennis. The proposed wind farm comprises 11 no. wind turbines with associated infrastructure including hardstands, access roads and substation, as well a temporary construction compound.

The purpose of this Spoil Management Plan is to ensure the wind farm is constructed safely and that the landscape is not adversely impacted as a result of the proposed development.

2. PURPOSE OF THE SPOIL MANAGEMENT PLAN

The purpose of this Spoil Management Plan is to describe how it is planned to construct Oatfield Wind Farm in a manner that ensures that the wind farm is constructed in a sustainable manner, the landscape is not adversely impacted as a result of the proposed development and that site management practices are carried out to complete the development safely and in the interest of orderly development.

The plan also sets out a methodology to prevent:

1. Rock or soil excavated during the construction phase from being adversely stockpiled on site following the completion of construction works in areas not suitable for same,
2. Adverse local effects on sensitive habitats.

The ultimate aim is to construct the wind farm project in a sustainable manner that facilitates regeneration of natural habitats at locations affected by construction works and that will minimise the damage incurred on sensitive habitats.

3. SPOIL MANAGEMENT

Site investigations were carried out along the proposed internal access road routes, at each turbine hardstand location and at the substation location. This detailed information allowed a location-specific assessment of ground conditions to be carried out. Based on this information, adjustments to the site infrastructure were carried out. The outcome of identifying all of the environmental, technical and engineering constraints for the site was that an infrastructural layout could be provided in the most sensitive way considering the need for spoil storage.

3.1. Excavated Spoil Management

Spoil will invariably be generated during excavations for roads, hardstands, wind turbine foundations, etc. Minimisation of the production of this spoil is to be treated as a high priority, but it is nevertheless accepted that there will be generation of excess spoil in the form of a mixture of topsoil, subsoil and rock.

It is proposed that spoil material generated due to the construction of the access roads, drainage ditches and turbine hardstanding will be utilised in the construction of road side and hardstand surround berms. The remainder of the excavated material will be stored at predesignated temporary stockpile locations within the site. This helps reduce the need for transportation of spoil across large areas and results in a reduced risk of dirty water generation.

3.2. Excavated Spoil

Owing to the good geotechnical conditions on site the works can be constructed on the existing surface with minimal subsoil excavation in a large number of areas. This cuts down the quantity of spoil generated. In areas of sloping ground there is a need to cut or fill into the ground to facilitate the necessary road and hardstand gradients. This results in the generation of sizeable volumes of spoil. Foundation excavations will also require excavation to depth. Other areas of construction, the substation for example, will also require the stripping of topsoil as a minimum. All of this infrastructure generates material that contributes towards the total cut spoil volume for the site.

The management of temporary spoil storage areas will involve the following:

- Excavated mineral shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards.
- All materials which require storage will be stockpiled at low angles (< 5-10°) to ensure their stability and secured using silt fencing where necessary. This will help to mitigate erosion and unnecessary additions of suspended solids to the drainage system.
- If necessary, mineral soils will be covered while stored to minimise run-off.
- Sediment management systems, such as silt fencing, will be provided around the proposed temporary spoil storage areas where necessary.

3.3. Temporary Storage of Excavated Material

No permanent stockpiles will be left on site after the completion of the construction phase works. After completion of the turbine base reinstatement works, all remaining stockpiled materials are to be used on site. It is proposed to use the stockpiled subsoil material to cover up the temporary access tracks within the site. It is further proposed to ensure the area upon which top soil is intended for reinstatement includes these covered up temporary access tracks.

Any materials excavated during the construction phase, which are to be used in the site reinstatement and landscaping process shall, in the first instance, be stored on site in an environmentally safe manner that will not result in the pollution of waters or the smothering of ecologically sensitive habitats.

The following principles will be adhered to when considering the temporary storage of excavated materials;

- Spoil will be deposited, in layers of 0.50m and will not exceed the thickness as indicated on the drawings (maximum stockpile height of 2.5m).
- Spoil will only be deposited on slopes of less than 5 degrees to the horizontal and greater than 10m from the top of a cutting.
- Once reinstatement is complete the temporary storage sites will be re-vegetated with the “top mat”. This refers to the use of topsoil intended for use in the farmland topsoil spread, to prioritise areas where construction activities were carried out and providing a suitable soil condition for the land owners.
- Upon commencement of the restoration phase, guidance from The Environmental Clerk of Works (EnvCoW) will be sought to confirm the methodology and programme.

Refer to Planning Drawings **20959-NOD-XX-XX-DR-C-08002** to **20959-NOD-XX-XX-DR-C-08006** for the location of the spoil storage areas on site.

3.4. Reinstatement

Reinstatement works will commence at a late stage of construction. However, part of the reinstatement works, such as the completion of a turbine foundation or hardstand can be carried out following the completion of individual sections of work. Ongoing restorative programming facilitates the immediate relocation of material from one turbine base excavation to another completed area and in doing so can limit the requirement for temporary storage of material on site.

Excess stone and spoil which is unsuitable as a vegetation layer shall be placed in the temporary spoil storage areas. Suitable material of sufficient density excavated during the works will be reused in various methods during the construction works. This includes the use of excavated materials in the construction of road side and hardstand surround berms and in finishing off the turbine hardstand areas after construction works, and the use of excavated subsoil for the backfilling of internal grid routes and as ballast on the turbine foundations.

Refer to Planning Drawings **20959-NOD-XX-XX-DR-C-08305** to **20959-NOD-XX-XX-DR-C-08307** for the extent of the spread lands for use of excess topsoil.

3.5. Control Measures

The following generalised control measures will be enforced during construction:

- No storage of excavated material other than in areas selected for such activities; temporary stockpile within the development footprint at proposed areas (maximum stockpile height of 2.5m).
- Exclusion zones delineating the working corridor will be installed around all working areas using post and rope fences. No activity will be permitted past this fence.
- Water build-up in excavations will be avoided.
- Upslope cut-off drains and surround berms will be installed in advance of construction.
- Existing drainage patterns will be maintained as far as is practicable.
- Deviation from the agreed work methodology must be agreed with The Environmental Clerk of Works (EnvCoW).
- The site supervisor will suspend work if work practices or weather conditions are unsafe as defined by Met Éireann's weather alert categories. The colour coding used by Met Éireann is fully aligned with international best practice and the European Meteoalarm system (www.meteoalarm.eu):

Alert Category	Description
• Yellow	• Not unusual weather. Localised danger.
• Orange	• Infrequent. Dangerous / disruptive.
• Red	• Rare. Extremely dangerous / destructive.

- Where suitable material is available, it will be used for the immediate backfilling of any excavations.
- Creating a methodology for covering up of the stockpiled materials during high rainfall events in order to minimise run-off.

4. SITE SPECIFIC SPOIL MANAGEMENT PLAN

4.1. Method of Excavation

The general principles of extraction set out in this plan will be adhered to at all times during the construction phase.

4.2. Method of Construction

For the construction phase, the activities that are considered likely to generate spoil are as follows:

- Construction of new and temporary excavated roads,
- Temporarily side casting of materials during excavation of drainage channels and construction of berms,
- Excavation and reinstatement areas for spoil,
- Excavations for turbine bases, crane hardstands, substation, meteorological mast and the temporary site construction compounds.

Prior to the commencement of construction work on the required infrastructure above, the following will be considered:

- Existing ground profile,
- Existing ground soil type,
- Bearing capacity of required roads, turbine bases and hardstands,
- Existing natural drainage regimes on site,
- Proposed turbine manufacturer assembly and transport delivery specifications,
- Environmental buffer areas and zones.

4.2.1. Excavated Infrastructure

New roads and hardstands will generally be constructed using imported stone aggregate obtained from local quarries and placed over a layer of geogrid. Where large cuts are required a limited amount of stone will be generated that can be reused in construction. A similar approach will be taken for other infrastructure required for the project.

Typically, the sequence of constructing new access roads and hardstands will comprise the following:

I. The appointed contractor will survey the area for any unforeseen hazards prior to the commencement of works and set up warning signage as appropriate.

II. Excavators will first remove any topsoil / vegetative layer which may be present if deemed required. Hardstands and roads will be constructed on grade where possible. This material will be transported to the temporary storage area and maintained for re-use during the restoration phase of the wind farm construction. Material to be reused will generally be kept adjacent to the location for reuse

where possible. Topsoil / vegetation removal will be kept to a minimum in order to prevent any runoff of silt during heavy rainfall.

III. Excavators will continue to strip and excavate the softer subsoil where required which will be temporarily stored adjacent to the works in accordance with approved methods with the use of an articulated dumper truck. Excavated material will only be temporarily stored on slopes under 10° and to a maximum height of under 2.0m at the required setback from streams at the selected temporary spoil storage areas where they will either be reused for construction activities immediately or be stored until the need to reuse the material arises.

IV. All excavations to be carried out will be battered back to a safe angle of repose.

V. Once a section of the excavated infrastructure is exposed to formation, a layer of geogrid will be laid out which will be covered with imported aggregate stone as required.

VI. The stone will be delivered to the required work area and spread out locally with the use of excavators and compacted with the use of a roller which will roll the stone aggregate in maximum 250mm layers on top of the geogrid / geotextile material in order to achieve the required design strength.

VII. Drainage as outlined in the relevant civil drawings will be constructed to manage clean and dirty water runoff in sensitive areas. Additional care will be taken during any construction works adjacent to the existing stilling ponds within the site.

VIII. The final running surface of the new excavated access roads will be capped with a layer of hard-wearing Cl 804 stone or similar using a road grader.

IX. Any surplus spoil material generated from the excavated infrastructure will be transported back to the temporary spoil storage areas. Excavated topsoil and subsoil will be kept separate at the excavation and storage areas.

X. The appointed contractor will ensure that on-site personnel are aware of environmental constraints / sensitive areas within the wind farm site in which works are to be avoided.

4.3. Reuse of Stockpiled Materials

The excavated topsoil is intended to be permanently deposited on the site. This will be done in the form of a topsoil spread across the farmlands within the project boundary. This will ensure no loss of useful topsoil material for the landowners.

Prior to the use of areas for storage an interceptor drain will first be excavated upslope in order to intercept existing overland flow and divert it around the storage area prior to discharge via a buffer zone on the downslope side. A dirty water cut-off drain will be provided on the downhill side of the storage area to catch dirty water run-off and transfer it to a settlement pond prior to discharge via a buffered outfall.

Inspections of the storage areas will be made by a geotechnical engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil temporary spoil storage areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated.

The surface of the deposited spoil will be profiled to a gradient not exceeding 10° and vegetated or allowed to vegetate naturally as indicated by the project ecologist.

Approximately 146,500 m³ of spoil material will be generated on site. Of this, an estimated 9,602 m³ will be rock and 136,898 m³ will be spoil (topsoil/subsoil). The excavated rock will be reused as a pond lining at the various existing ponds inside the site boundary. Approximately 30,892 m³ of the spoil will be reused as ballast for the backfilling around the turbine foundations, for the finishing of the turbine hardstands and for the backfill related to the internal grid route. Approximately 95,586 m³ of the spoil will be reused as berms around the access track and hardstands. The remainder of the surplus excavated spoil material, estimated at 36,239 m³ will be used to cover up the temporary access tracks and temporary hardstands after the completion of construction works. The cover-up of the temporary access tracks and hardstand areas would result in the ground level being reprofiled to ensure tie-in with the surrounding existing levels.

The surplus spoil material are proposed to be stored at 2 stockpile locations. The storage areas proposed can accommodate the expected volumes of material without the need to transport spoil across the site area.

The quantity of spoil material requiring management on site has been calculated as shown in Table 1 below.

Table 1 Spoil Excavation Volumes

Development Type	Spoil Generated (m³)	Spoil Reused (m³)
Infrastructure works	44,287	53,029
Hardstands and Turbines	44,533	68,955
Substation and Temporary Compound	6,811	0
Internal Grid Route	4,669	4,494
GCR and IPP Cable Works	46,201	37,433
Reinstatement works	0	36,239
Total Spoil	**146,500**	**200,151**
Total Spoil including Bulking Factors	**188,876**	**200,151**

A summary of the spoil storage volumes is shown in Table 2.

Table 2 Spoil Storage Volumes

Spoil Storage Area	Percentage Spoil Stored (%)	Approx. Volume (m³)
Near Turbine T5	60	15,522
Near Turbine T9	40	10,348
Total	**100**	**25,870**

4.4. Role of Environmental Clerk of Works (EnvCoW)

An EnvCoW will be appointed for the construction phase of the development. As part of this role the EnvCoW will conduct the following works in relation to surplus spoil management:

- Mark ecological constraints on the working areas and route corridors, in consultation with the Geotechnical/Civil Designer as necessary,
- Agree proposals for temporarily side casting and temporary storage areas as development proceeds,
- Agree methodology for stripping existing vegetation and locations where material is to be deposited,
- Agree timing of restoration and reinstatement of access track sides,
- Issue instruction to cease work if unexpected risks arise, until an agreed alternative solution is identified, and risks are avoided or minimised.

5. CONCLUSION

The ground conditions at this site are such that the creation of spoil can be minimised. This is owing to a solid formation expected at relatively high levels. No peat is present on site and all of the excavated spoil can be reused. Spoil will be reused or stored locally on a temporary basis to its point of generation, reducing the impact of long-haul routes. Sufficient temporary storage areas are provided for material that are intended for reuse in a later stage of the project.

Proposed Oatfield Wind Farm

Oatfield Wind Farm Project

Construction Environmental Management Plan

Appendix C - Resource Waste Management Plan

604569

DECEMBER 2023

Orsted Ireland Midco Limited.

Oatfield Wind Farm CEMP

604569

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1 INTRODUCTION

1.1 This Resource Waste Management Plan (RWMP) forms part of the Construction Environmental Management Plan (CEMP) for the Oatfiled Wind Farm (the proposed Development) in Co. Clare.

1.2 The RWMP is intended to form the basis of providing information on the waste management required for the construction of the wind farm and grid connection during the following phases:

- Construction of the Development
- Operation of the Development
- Decommissioning of the Development

1.3 The RWMP should be considered a live document and is to be updated by the Contractor on a quarterly basis, or as more frequently as the need arises to ensure that it is current and has the most up to date information and contact details.

1.4 A copy of the RWMP and any updates shall be maintained on site as part of the Contractor's waste Management File.

1.5 An electronic copy of the RWMP and any updates shall be provided to the following:

- Oatfield Wind Farm Project office
- Environmental Clerk of Works
- Clare County Council Planning Department
- All sub-contractors working on the project.

1.6 The Contractor shall maintain a record of all versions of the RWMP issued and to whom on the Waste Management filet to be maintained on site.

2 TRENDS IN WASTE MANAGEMENT

National Level

Construction and Demolition Phase

2.1 It is only in recent years that comprehensive reports regarding the quantities of commercial and residential waste produced in Ireland have been compiled. The EPA (Environmental Protection Agency) have produced reports that provide estimates for waste generation and the level of recycling, recovery and disposal of waste material. Key Trends in the EPA waste data release of 10 August 2023 (Latest reference year 2021).

- The quantity of Construction and Demolition (C&D) waste generated and collected in Ireland in 2021 increased to 9 million tonnes from 8.2 million tonnes in 2020 an increase of 10%.
- The overall composition of C&D waste changed little between 2020 and 2021. At 85%, soil and stone waste remained dominant, followed by waste concrete, brick, tile and gypsum (7%) and mixed C&D waste (4%). The proportion of segregated (wood, paper, glass, plastic and metal) C&D waste collected remained small at just under 4% increasing from 3.1% in 2020.
- The vast majority (96 %) of C&D waste underwent final treatment in Ireland in 2021; only 4% was exported abroad for final treatment.
- Most C&D waste was backfilled (85%), with only 8% and 7% was recycled and sent for disposal, respectively. The dominance of backfilling as a treatment operation reflects the large proportion of soil and stones in C&D waste.
- Recycling was the main treatment operation for metals (100%), for segregated wood, paper, glass and plastic (77 %).
- For non-hazardous C&D waste other than soil and stone, Ireland achieved 85% material recovery, surpassing the 70% European target.

2.2 Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) and as amended which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of the ‘waste hierarchy’, which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal).

2.3 EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. The Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing, and recycling existing materials and products.

2.4 The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, Waste Action Plan for

a Circular Economy (WAPCE) – Waste Management Policy in Ireland[1], was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, A Resource Opportunity – Waste Management Policy in Ireland, in 2015[2].

2.5 One of the first actions to be taken from the WAPCE was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)[3] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

2.6 The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's 'Best Practice Guidelines for the Preparation of Resource Waste Management Plans for Construction & Demolition Projects' (2021)[4]. This sets out good practice approaches to prevent waste, reuse materials, reduce waste and better manage C&D wastes that cannot be prevented on development projects. Project developers are to implement these practices and document these activities into a project Resource Waste Management Plan (RWMP) which will develop as the project progresses from design though to construction.

Operational Phase

2.7 National policies govern the way in which waste is managed and outlines responsibilities of waste producers, carriers and receivers, planning authorities and regulators and other waste management organisations. The Principal legislation is the Waste Management Act 1996, and a series of regulations have been produced under this act. These legislative instruments are summarised in this report. For example, this legislation will apply to:

- The Authorisation of Waste Facilities and Waste Collection Activities
- Waste Management Planning
- Hazardous Waste
- Waste Electrical and Electronic Equipment
- The Movement of Waste

2.8 Waste Management Policy is set by the Government and is detailed in four key policy documents. It is strongly based upon the Waste Hierarchy and includes measures that are relevant to all 5 tiers of the hierarchy (prevention and minimisation, reuse, recycling, recovery and disposal). The principles set out in the Waste Action Plan for a Circular Economy (WAPCE) – Waste Management Policy in Ireland and the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) will be followed during the operational phase of the project.

[1] https://www.gov.ie/en/publication/4221c-waste-action-plan-for-a-circular-economy/

[2] https://www.gov.ie/en/publication/a9d98-a-resource-opportunity-waste-management-policy-in-ireland/

[3] https://www.gov.ie/en/publication/b542d-whole-of-government-circular-economy-strategy-2022-2023-living-more-using-less/

[4] https://www.epa.ie/publications/circular-economy/resources/best-practice-guidelines-for-the-preparation-of-resource--waste-management-plans-for-construction--demolition-projects.php

Regional Level

Construction and Demolition Phase

2.9 The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of "70% preparing for reuse, recycling and other recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

2.10 The National Waste Statistics update published by the EPA in December 2017 identifies that Ireland's current progress against this C&D waste target is at 85% and our progress against 'Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)' is at 45%. Both of these targets are required to be met by 12 December 2020 in accordance with the requirements of the Waste Framework Directive.

2.11 Recent guidance in A Waste Action Plan for a Circular Economy 'Irelands National Waste Policy 2020-2025' states that the current national challenge regarding C&D waste is as follows;

- Promote waste prevention in the first instance;
- Follow best available techniques;
- Expand the range and use of recycled products;
- Create a market demand for recycled products and segregating more material on-site to allow for recycling; and
- Meet the target (from The Regional Plan) of preparing for reuse, recycling and other material recovery (incl. beneficial backfilling operations using waste as a substitute) of 70% by weight of C&D non-hazardous waste (excluding natural soils & stone).

Operational Phase

2.12 The Southern Region Waste Management Plan 2015 - 2021 provides a framework for the prevention and management of waste in a sustainable manner in 10 local authority areas including Clare County.

2.13 The three key objectives of the Southern Region Waste Management Plan are:

- 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieving a recycling rate of 50% of managed municipal waste by 2020; and
- Reducing to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices

2.14 Future targets set in the Plan for 2030 include:

- Preparing for reuse and recycling of 60-70% of municipal waste by the end of 2030;
- Reduce and where possible, eliminate the landfilling of all major waste streams including municipal, industrial and construction & demolition wastes in favour of the recovery of residual wastes.

2.15 Further to this, the development will comply with the requirements set out in the County Clare Waste Management Bye-Laws for the Storage, Presentation and Collection of Household and Commercial Waste, 2018[5] or any revision thereof, must be adhered to and, in particular, the requirement in the Bye-Laws to segregate waste into separate fractions to facilitate the collection of dry recyclables, organic kitchen/garden waste and residual waste in line with the applicable regulations, including the Waste Management (Food Waste) Amendment Regulations 2015 (S.I. 190 of 2015) and the European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. 430 of 2015), and the Southern Region Waste Management Plan.

Local Authority Level

2.16 The Clare County Council Development Plan (CCC) (2023-2029[6]) illustrates that waste management planning is a vital requirement in the advocating for sustainable development, enhancing good public health and for the protection of the environment. The CCC is strongly committed to both national and EU waste management goals and legislation. As stated in the Development Plan –" Clare County Council, in conjunction with the other local authorities in the Southern Region, has a role in the implementation of the A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025 and the Southern Region Waste Management Plan 2015-2021. The Council will also have a role in implementing the upcoming National Waste Management Plan for a Circular Economy (NWMPCE), which will be the successor to the Southern Region Waste Management Plan".

2.17 The Development Plan has identified key policies applicable to supporting the Waste Action Plan for a Circular Economy and the Southern Region Waste Management Plan in objective BE 15-14: Waste Prevention and Management

Legislative Requirement

2.18 The primary legislative instruments that govern waste management (both hazardous and non-hazardous) in Ireland and applicable to the project are:

- Waste Management Act 1996 (Act No. 10 of 1996) as amended 2001 (Act No. 36 of 2001), 2003 (Act No. 27 of 2003) and 2011 (S.I. No 20 of 2011). Subordinate and associated legislation includes:
    - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended 2011 (S.I. No. 323 of 2011)
    - Waste Management (Collection Permit) Regulations 2007 (S.I No. 820 of 2007 as amended 2008 (S.I No 87 of 2008) and 2016 (S.I No. 24 of 2016)
    - Waste Management (Facility Permit and Registration) Regulations, (S.I No. 821 of 2007) as amended 2008 (S.I No. 86 of 2008), 2014 (S.I No. 320 and No. 546 of 2014) and 2015 (S.I. No. 198 of 2015)
    - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended 2004 (S.I. No. 395 of 2004) and 2010 (S.I. No. 350 of 2010)

[5] https://www.clarecoco.ie/services/waste-and-recycling/legislation/waste-management/

[6] https://www.clarecoco.ie/services/planning/clarecountydevelopmentplan23-2029/

- European Union (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended 2015 (SI No. 542 of 2015).
- Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
- Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015) o European Communities (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- Waste Management (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended 2014 (S.I. No. 349 of 2014) and 2015 (S.I. No. 347 of 2015)
- Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009) as amended 2015 (S.I. 190 of 2015) and European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
- Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended 2000 (S.I. No. 73 of 2000)
- Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended by European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994)
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015)

- Planning and Development Act 2000 as amended 2010 (Act No. 30 of 2010) and 2015 (S.I. No. 264 of 2015, S.I. 310 of 2015).
- Protection of Environment Act 1992 as amended (Act. No. 27 and S.I. 413 of 2003) as amended by the Planning and Development Act 2000 (Act No. 30 of 2000).
- Litter Pollution Act 1997 (Act No. 12 of 1997) as amended by the Litter Pollution Regulations 1999 (S.I. No. 359 of 1999) and Protection of the Environment Act 2003.

2.19 These Acts and subordinate Regulations enable the transposition of relevant European Union Policy and Directives into Irish law.

2.20 One of the guiding principles of European waste legislation, which has in turn been incorporated into the Waste Management (amended) Act 2001 and subsequent Irish legislation, is the principle of “Duty of Care”. This implies that the waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal.) As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to physically transport waste to the final waste disposal site.

2.21 It is therefore imperative that occupants undertake on-site management of waste in accordance with all legal requirements and employ suitably permitted/licensed contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contractor handle, transport,

and reuse/recover/recycle/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

2.22 A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the Waste Management (Facility Permit & Registration) Regulations 2007 as amended or a waste or IED (Industrial Emissions Directive) licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3 PROJECT DESCRIPTION

Site Location and Plan

3.1 The Proposed Development is located in County Clare in the townlands indicated in Table 1 of and its location is provided in in Figure 1.

Table 1: Townlands and Electoral Districts in which the proposed Project is located

Proposed development area	Townlands	
IPP Cabling connecting Eastern DA to Western DA	• Drumsillagh Or Sallybank (Parker) • Mountrice • Cloontra West • Kyle • Derryvinnaan • Cloontra East	• Drumsillagh Or Sallybank (Merritt) • Cloonsheerea • Cloontra • Cloghera • Oatfield
Western DA inclusive of turbines, site access tracks, substation, and construction compound	• Cloghoolia • Belvoir • Cloontra West • Crag	• Snaty (Massy) • Snaty (Wilson) • Cloontra • Oatfield
Eastern DA inclusive of turbines, site access tracks, substation, and construction compound	• Gortacullin • Kyle • Hurdleston • Knockshanvo	
GCR from wind farm to Loop-in substation at Ballycar	• Ballycar North • Derrynaveagh • Oatfield	

Proposed development area	Townlands			
TDR Route from Foynes Port to the Proposed Development	• Woodpark • Tooreen • Cloonfadda • O'Briensbridge • Knockbrack lower • Bohereen • Corcamore • Coolderry • Drumsillagh or Sallybank (Parker) • Lackenavea (Egremont) • Crossagalla • Huntingstown • Ballyclogh • Richhill • Mountrice • Skehacreggaun • Ballyengland Lower • Cragbeg • Cloontra West • Morgans South • Rincullia • Ballynacourty • Court • Crag • Ardaneer • Kyle • Deegerty • Ballybrack • Derryvinnaan • Lisnagry	• Coolnadornory • Tomdeely South • Robertstown • Blossomhill • Ballysimon (Staunton) • Killeen • Ballybrown • Carrowkeel • Gooig • Loughanleagh • Inchmore • Rathurd • Askeaton • Shantraud • Cloonlara • Bohereen • Dromlohan • Cragmore • Ross • Cloonreask • Ballyvareen • Ardataggle • Gortnalahagh • Ballysimon • Touknockane • Cowpark • Rathmale • Cloghatacka • Cloontra East • Killestry • Ardcloony • Craggs	• Sroolane • Moig South • Lackenavea (Dunalley) • Sroolane North • Knockroe • Rathbane South • Ballinacurra (Weston) • Coolbeg • Annaholty • Drumsillagh or Sallybank (Merritt) • Knockadromin • Aharinaghbeg • Newtown • Cloon and Commons • Cloonsheerea • Bunlicky • Ballyard • Cloontra • Monaskeha • Cloghera • Moys • Oorla • Rossbrien • Cooleen • Bolane • Parkwood • Glennameade • Gardenhill • Aughboy • Sallymount	• Garraun • Ballyduane • Ballyhomin • Ballykeeffe • Ballyvogue • Ballyengland upper • Doon • Peafield • Gortybrigane • Garraunykee • Ballinacurra (Hart) • Dromintobin South • Kildoorus • Corgrig • Kilmaglasderry • Banemore • Garrynatineel • Boherboy • Killonan • Roolagh • Oatfield • Bartleystown • Knockbrack Upper • Derreen • Coolrahnee • Crokerspark • Glenbane East • Ballyrune • Dooradoyle • Elmpark Demesne • Tomdeely North • Mountshannon

Proposed development area	Townlands			
	• Woodstown • Dromintobin North		• Castlemungret • Currahchase North	

3.2 The Proposed Development is an eleven (11) No. wind turbine project. The area of the proposed Wind Farm is located within forested and agricultural lands on the northern slopes of Slieve Bernagh mountain, approximately 4 km northeast of the village of Broadford, 7km north-west of Killaloe and 2.5 km south of the village of Bodyke, at its closest point. Lough Derg lies approximately 4km to the east of the proposed development area (Figure 2.1).

3.3 The Proposed Development site boundary (which is the planning boundary) includes:

3.4 two distinct areas; the Western PDA (approximately 153 hectares) and the Eastern PDA, (approximately 139hectares) comprising of a total land area of approximately 296 hectares which principally consists of conifer plantation, transitional woodland scrub, mixed forest, pastures, agricultural lands and peat lands.

3.5 IPP connection route from the Eastern PDA to the 110kV substation located in the Western PDA: The IPP cables will be installed within the body of the local public road network along the route illustrated in Figure 2.2. Cable joint bays will be installed every 100m to facilitate joining of cable lengths. The overall length of this interconnecting IPP cable route is approximately 10.55km.

3.6 The Proposed Development will be connected into either the existing Ardnacrusha to Ennis 110kV Overhead Line (Option A) or the existing Ardnacrusha to Drumline 110kV Overhead Line, (Option B),via a loop in 110kV double circuit underground cable to Loop-in masts at Ballycar North. Both options are included for planning purposes and have been assessed in the EIAR. The UGC works will require a double circuit which entails that two trenches in parallel are required for the entire length of the cable route with a minimum separation distance of 2000mm required between each circuit.

3.7 The proposed design for the 110kV Loop-In to the existing OHL will require two new Interface Mast structures which will be constructed under the existing 110kV OHL, n. The existing OHL conductor will be terminated at these two new structures in order to transition from an overhead line to an underground cable arrangement to facilitate the loop into Proposed Development 110kV Substation via cable chairs. The existing conductor will be removed between the Interface Mast structures with the new connection looped through to the new Proposed Development 110kV Substation.

3.8 The new interface mast structure locations were selected based on ground surveys, ground profiles, allowable angles and ruling span checks. The expected duration of works is expected to be approx. 4 weeks. Construction of foundation circa. 7 days each, erection of the Interface masts circa 5 days, weather dependant.

3.9 The cable route for Option A follows the existing trackway (which will be upgraded) and road infrastructure from the Proposed Development 110kV substation, located in the Western DA) to the proposed loop-in location to the existing Ardnacrusha – Ennis 110kV OHL at Ballycar North. A short section of the cable route will be ducted from the existing road network through third party lands at Ballycar North to the loop-in masts location. An access track will be constructed on these third-party lands to facilitate construction of the cable ducts and maintenance of the cables. This Option is 3.83 km in length.

3.10 Cable ducting trenches will be 2000mm in width and 1200mm deep. The section of road leading from the Western DA to the junction with the R471 will also accommodate the

IPP cable from the Eastern DA to the proposed 110kV substation. Each cable trench will accommodate 3 cable ducts (three phases of electricity and two communication ducts).

3.11 A total of ten cable joint bays will be constructed along the cable route to the Loop-in masts in Ballycar North, five on each circuit. The cable joint bays will be staggered within the existing roadway at the cable joint bay locations. Each joint bay will comprise a concrete bay 4.5m in length 2.3m in width and 2.4m in depth.

3.12 Two communication chambers will also be constructed at each cable joint bay associated with each 110kV underground cable. These chambers will be 1.25m in length, 1.1m in width and 1.25m in depth.

3.13 The cable ducting will be placed into the prepared trench, inspected, and then the trench will be backfilled and the surface of the road reinstated.

3.14 110kV cables will be pulled from truck or trailer mounted cable reels through the ductwork from the proposed development 110kV substation to the Loop in location on the Ardnacrusha to Ennis 110kV Overhead Line Sections of cable will be jointed along the cable route at the cable joint bay locations.

3.15 The existing 110kV OHL conductor will be terminated at these two new structures in order to transition from an overhead line to an underground cable arrangement to facilitate the loop in via cable chairs. The existing conductor will be removed between the Interface Mast structures with the new connection looped through to the new Proposed Development 110kV Substation.

3.16 The cable route for Option B (Ardnacrusha to Drumline) follows the exact same cable route as Option A with the only difference being that the 110kV double circuit continues further south for a distance of 300m on third party lands to the interface location with the existing Ardnacrusha to Drumline 110kV OHL. Again, the interface will occur via two new interface masts beneath the line. The existing 110kV OHL conductor will be terminated at these two new structures in order to transition from an overhead line to an underground cable arrangement to facilitate the loop in via cable chairs. The existing conductor will be removed between the Interface Mast structures with the new connection looped through to the new Proposed Development 110kV Substation.The total length of this option is 4.16km.

3.17 The proposed turbine delivery route from Foynes Port in County Limerick to the Proposed Development Areas

3.18 The wind farm site is characterised by primarily mixed farmland habitat with hedgerows and occasional areas of scrub, ponds and lakes and man-made drains and ditches. The area in which the turbines will be located, within the setback buffer, ranges in elevation from 133m AOD in the south to 120m AOD in the north.

4 DESCRIPTION OF THE DEVELOPMENT

4.1 The Proposed Development comprises:

- 11 no. three-blade wind turbines with an overall ground to blade tip height in the range of 176.5m to 180m, a rotor diameter in the range of 133m to 150m and a hub height in the range of 105m to 110m across the Eastern DA and the Western DA;
- Construction of associated reinforced concrete foundations, crane pad hard-standing areas, associated drainage infrastructure and associated plant/switching gear;
- Construction of new permanent site tracks and associated drainage infrastructure;
- Upgrading of existing tracks and associated drainage infrastructure;
- 2 no. temporary spoil storage areas;
- Erection of 1 no. permanent meteorological mast with a height of 100 m above existing ground levels
- Provision of underground interconnecting 33kV cabling and underground cable joint bays every 1000m (joining Eastern and Western DAs) within the local public road network
- Provision of 1 no. 110kV onsite substation and parking in the Western DA, along with associated control and switchgear building, associated electrical plant and equipment, associated security fencing, external lighting and lightening protection and telecommunications masts, security cameras and all associated infrastructure;
- All works associated with the connection of the proposed wind farm to the national electricity grid via double circuit 110kV underground cabling Two Options are proposed as follows:
- Option A (loop-in to Ardnacrusha to Ennis 110kV Overhead Line via 3.83km of double circuit underground cables and joint bays every 700 m from the onsite 110kV substation to new Loop-in masts located in the townland of Ballycar North.
- Option B (loop-in to Ardnacrusha to Ennis 110kV Overhead Line via 4.16km of double circuit underground cables and joint bays every 700 m from the onsite 110kV substation to new Loop-in masts located in the townland of Ballycar North.
- 10 no. Site access entrances from the local road network running north of the R471 and R471a;
- Tree felling to accommodate the construction and operation of the proposed development. 2 nos. temporary construction compounds, including offices/meeting rooms, parking and transformer;
- All site drainage works including the installation of an on-site Sustainable Drainage System (SuDS);
- Accommodation works along the Turbine Delivery Route
- All associated site development works including Construction, Operation and Decommissioning stage site lighting, fencing and signage;

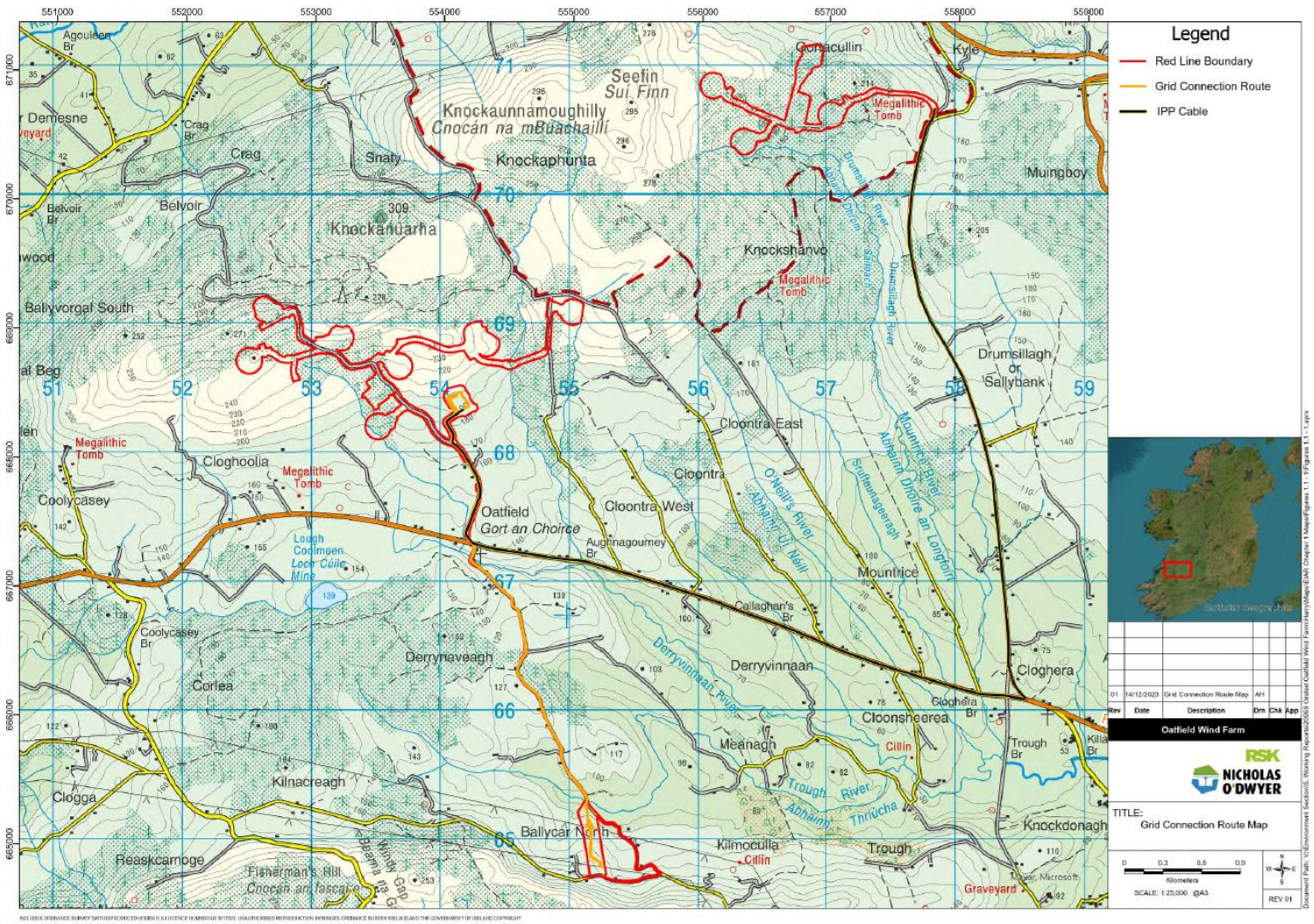

Figure 3.1: Proposed Development Project and Grid Connection Site Location Map

5 WIND FARM WASTE GENERATION

Construction and Demolition Phase

5.1 A high-level overview of the construction activities, with the potential to generate excess material involved is provided below. This list is not exhaustive and is provided to give an overview of the likely type of activities. Note also that the precise order in which these activities will take place is not known at this stage.

- Site compound, Site Offices / Staff Welfare Units and Storage Compound;
- Temporary staff parking;
- Vegetation removal, topsoil stripping and excavation
- Subsoil excavation,
- Storage of topsoil and subsoil for future reuse, breakout and crushing of hardstanding,
- Removal of surplus material / spoil if required;
- Construction of the drainage network, drainage and silt control measures including stilling ponds
- Importation of fill;
- Importation of steel
- Importation of concrete
- Construction of new units - foundation trenching, establishment of foundations, installation of utilities, SuDS, importation of building materials by HGV, storage of building materials, erection of units, erection of scaffolding, roofing, internal fit out and painting;
- Construction of access routes and parking areas - site levelling, earthworks, soil compaction, installation of road base, kerbing, road drainage, tarmacking and paving surface; and,
- Removal of hedgerows and reinstatement
- Construction of site tracks and upgrade of water course crossing as required;
- Construction of turbine crane hardstanding's;
- Construction of turbine foundations and wind turbine assembly
- Construction of control building/substation;
- Construction of meteorological mast foundations and erection of metmast
- Internal site cabling installation;
- Construction of Control building and substation including
    - Installation of switchgear/metering;
    - Installation of transformer and externals;
- Landscaping and Signage.
- Construction of the grid connection including;
    - Linear trenching, ducting along the road network to Mallow 110kV Substation;
    - Construction of cable joint bays (6m long, 2.5 m wide and 2 m deep), along with two smaller communication link box chambers at intervals along the route;

- Cable pulling and interface with the wind farm substation and either the Ardnacrusha to Ennis 110kV Overhead Line or the Ardnacrusha to Drumline 110kV Overhead Line in the townland of Ballycar North;
- Off-site remedial works associated;

Details of the Non-Hazardous Wastes to be Produced

5.2 No demolition is proposed at the site. Any non-hazardous waste generated will be reused where possible.

5.3 Any vegetation clearance required will generate significant quantities of green waste. This waste will be reused where possible. Examples include the creation of habitats for wildlife and the chipping of any vegetation to create mulch. Such examples of reuse may require the registration of an appropriate waste exemption. If reuse is not possible, then any green waste should be handled and transported from site by an appropriately registered contractor.

5.4 There will be soil and stone excavated to facilitate the construction of the Proposed Development. Approximately **100,744m³** of topsoil, **72,769m3** of subsoil and **15,363m³** of rock inclusive of Option A grid connection and **101,091m³** of topsoil, **74,390m3** of subsoil and **15,363m³** of rock inclusive of Option B grid connection.

5.5 Approximately, **100,939m³** of topsoil will be reused on site for the purpose of berm construction and landscaping purposes. The residual topsoil material, approximately **152m³**, will be stockpiled in designated areas for later use in site decommissioning. Excavation of subsoil layers will be required as part of turbine foundation excavation, drainage, substation and meteorological mast installation.

5.6 It is estimated that the quantity of subsoils to be excavated due to site clearance and preparation will be **72,769m³** to **74,390m³** depending on the Grid connection option constructed. Disturbed subsoil layers will be stabilised as soon as practicable and reused in road construction for gradient purposes, in construction of berms, hardstand areas, underlying wind turbine foundations and for internal grid construction. An estimated **83,706m³** to **85,052m³** of subsoil will be reused for this purpose. Approximately **10,937m³** of fill subsoil will be imported to site meet the overall requirement.

5.7 An estimated **15,363m³** of weathered rock and bedrock will be excavated and transported off site where it will be crushed and graded and then reused on site.

5.8 All suitable non-hazardous excavated material will be reused on site where possible. Any excavated material that cannot be reused shall be handled and transported to designated stockpile areas on site. A wide variety of non-hazardous waste will be generated during the construction phase. Typical waste types are listed within Table 10.1.1 below.

5.9 This section is also reflective of any repairs and maintenance works during the operational phase of the development,

Details of the Hazardous Wastes to be Produced

Contaminated Soil

5.10 Environmental soil analysis will be carried out prior to construction on a number of soil samples in accordance with the requirements for acceptance of waste at landfills (Council

Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability.

Fuel/Oil

5.11 Any on-site storage of fuel/oil, all storage tanks and all draw-off points will be bunded (or stored in double-skinned tanks) and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil wastage at the site.

Invasive Species

5.12 Invasive non-native species have been identified at the Proposed Development and an Invasive Species Management Plan has been prepared for the site. Prior to any required vegetation removal, a biosecurity expert will be engaged to implement the management plan. This management plan will include how the removal of any identified invasive non-native plants will be undertaken in accordance with the latest guidance to prevent further growth or spread both within and beyond the site.

Other known Hazardous Substances

5.13 Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum.

Main C&D Waste Categories

5.14 The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 4.1 below. The List of Waste (LoW) code (also referred to as the European Waste Code or EWC) for each waste stream is also shown.

5.15 This section is also reflective of any repairs and maintenance works during the operational phase of the development.

Table 4.1: Typical waste types generated and EWCs.

Waste Material	EWC Code
Concrete, bricks, tiles, ceramic	17 01 01, 17 01 02, 17 01 03, 17 01 06* & 17 01 07
Wood, glass, and plastic	17 02 01-04
Bituminous mixtures, coal tar and tarred products	17 03 01-03
Metals (including their alloys)	17 04 01-07 & 09-10
Soil and stones	17 05 03-04
Gypsum-based construction material	17 08 02
Mixed C&D waste	17 09 04

Waste Material	EWC Code
Electrical and electronic components	20 01 35-36
Batteries and accumulators	20 01 33-34
Liquid fuels	13 07 01-03
Paints	08 01 12
Chemicals (solvants, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
*** Indicates a hazardous substance**	

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Site Clearance and Earthworks

5.16 Demolition works at the site can be classed as minimal, as the site is currently undeveloped. It is anticipated that significant vegetation clearance, vegetation maintenance, earthworks and ground preparation from cut and fill works will be required as part of the development. It is currently estimated that the quantity of excavated material due to site clearance and preparation of foundations, access tracks, substation and grid connection will be approximately **100,744m³** of topsoil, **72,769m3** of subsoil and 15,363m3 of rock inclusive of Option A grid connection and **101,091m³** of topsoil, **74,390 m3** of subsoil and **15,363m3** of rock inclusive of Option B grid connection. There is the potential for contaminants in any enabling works. In the event that there are any contaminated materials found in the area of hardstanding, these will be removed and disposed of, at an approved facility, in an environmentally sustainable and responsible manner.

5.17 Removal of the existing topsoil layer (approx. 300mm thick) will occur at the wind turbine locations, hardstand areas, drainage network, substation location, meteorological mast location, contractors' compound, loop-in mast locations and along the road network margins, and removal of the topsoil layer will be coordinated with the proposed staging for the development. The extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work area(s) and will be programmed to minimise soil handling / double soil movements. Stripped topsoil will be temporarily stockpiled and reused on site for roadside and hardstand berm construction and surface reinstatement . It is anticipated that all topsoil excavated as part of the proposed development will be reused. Any excess material will be stored on site, in the designated spoil storage areas for future reuse at decommissioning stage.

5.18 Excavation of subsoil layers will be required as part of turbine foundation excavation, drainage, substation and meteorological mast installation. Disturbed subsoil layers will be stabilised as soon as practicable and reused in road construction for gradient purposes, in construction of berms, hardstand areas, underlying wind turbine foundations and for internal and external grid construction. It is anticipated that some **10,937m³** of subsoil material will be imported to the site.

5.19 Weathered rock and bedrock will be excavated and transported off site where it will be crushed and graded and then reused on site.

5.20 All suitable non-hazardous excavated material will be reused on site where possible. Any excavated material that cannot be reused shall be handled and transported to designated stockpile areas on site.

Grid Connection

5.21 The Proposed Development will be connected to the National Grid via Loop in masts to the existing 110kV Overhead line located at Ballycar North. Two Options are proposed, Option A will connect the Proposed Development into the Ardnacrusha to Ennis 110kV Overhead Line and Option B will connect it into the Ardnacrusha to Drumline 110kV Overhead Line. This 110kV OHL is located some 300m south of the Ardnacrusha to Ennis OHL.

5.22 The proposed design for the 110kV Loop-In to the existing OHL will require two new Interface Mast structures which will be constructed under the existing 110kV OHL. The existing OHL conductor will be terminated at these two new structures in order to transition from an overhead line to an underground cable arrangement to facilitate the loop into the Proposed Development 110kV Substation via cable chairs. The existing conductor will be removed between the Interface Mast structures with the new connection looped through to the new Proposed Development 110kV Substation.

5.23 The new interface mast structure locations were selected based on ground surveys, ground profiles, allowable angles and ruling span checks. The expected duration of works is expected to be approx. 4 weeks. Construction of foundation circa. 7 days each, erection of the Interface masts circa 5 days, weather dependant.

5.24 The cable route for Option A follows the existing trackway (which will be updraded) and road infrastructure from the Proposed Development 110kV substation, located in the Western DA) to the proposed loop-in location to the existing Ardnacrusha – Ennis 110kV OHL at Ballycar North. A short section of the cable route will be ducted from the existing road network through third party lands at Ballycar North to the loop-in masts location. An access track will be constructed on these third-party lands to facilitate construction of the cable ducts and maintenance of the cables. This Option is 3.83 km in length.

5.25 The cables will be pulled through the ducts and joined together at joint bays located along the route. The Joint Bay will comprise three underground pre-cast concrete chambers – a joint bay chamber (4.5 m long, 2.3m wide and 2m deep), along with two smaller communication link box chambers. Cable pulling, jointing and testing will be carried out at the start and end point at each Joint Bay. Once the cables have been jointed and commissioned, the entry and exit and joint bay chamber will be filled with sand and a concrete cover fitted on top.

5.26 A man-hole type cover will be fitted over the start and end points of the grid connection cable route and over the Joint Link Bay chambers. Over-ground identification marker posts and marker plates will be installed along the route. The manhole covers and marker plates/posts will be the only surface expression of the cabling when works are completed.

A total of ten cable joint bays, with associated communication chamber boxes will be constructed along the double circuit cable route. These will b ein close proximity but staggered within the road infrastructure. This will require the excavation of approximately **1,485m^3** of material. Construction and backfilling around the joint bays will require some concrete and imported sand. It is anticipated that **1,485m^3**, approximately **114m^3** per site) of excavated material will be removed from the construction sites to a licensed waste handling facility.

Management of Surplus Material

5.27 It is envisaged that material excavated to construct all infrastructure elements of the wind farm (foundations, tracks, hardstands, etc.) will be used as backfill, access track construction, berm construction, for site reinstatement and landscaping purposes.

5.28 The majority of spoil generated on site will be of subsoils and till with some rock excavated at foundation locations.

5.29 The majority of rock excavated on site will be reused for access track construction following removal from site, crushing an degrading and returned to site for this purpose.

5.30 A summary estimate of materials excavated at the wind farm site and reused in construction, inclusive of Grid Connection Option A is provided in **Table 4.2** below:

Table 4.2: Balance of Materials Generated and Reused on site (Option A)

Balance of materials following reuse on site	Generated (m3)	Reused on site (m3)	Balance of material (m3)
Topsoil	100,754	100,634	109.15
Subsoil	72,769	72,769	
Aggregate/rock on site	15,362	15,362	

5.31 A summary estimate of materials excavated at the wind farm site and reused in construction, inclusive of Grid Connection Option B is provided in **Table 4.3** below:

Table 4.3: Balance of Materials Generated and Reused on site (Option B)

Balance of materials following reuse on site	Generated (m3)	Reused on site (m3)	Balance of material (m3)
Topsoil	101,091	100,939	152
Subsoil	74,390	74,390	
Aggregate/rock on site	15,362	15,433	

5.32 The balance of generated and surplus material will be reused or temporarily stored for a relatively short period during the construction phase. It will be stored in designated temporary spoil deposition storage areas to be used during construction and reinstatement and will be limited to 1m height.

5.33 Excavated and surplus material will be stored at two locations and will be used for site construction and reinstatement purposes during the decommissioning phase. The dimension of the stock pile areas is shown in **Table 4.4** (Option A grid connection) together with the estimated percentage breakdown of surplus material at each location.

Table 4.4: Dimensions of stockpile areas within the wind farm site

Maximum Stockpile Size Required	**Near T5 and Substation (Western DA)**	**Volume**	15,162m^3
		Area provided	15,603m^2
Maximum Stockpile Size Required	**Stockpile near T9/T10 (Eastern DA)**	**Volume**	10,348m^3
		Area Provided	15,603m^2

5.34 The material excavated for the construction and upgrade of site access tracks will be reused or placed mainly in berms alongside the wind farm access tracks and/or stockpiled in designated temporary storage areas (at a height not exceeding 1 m).

5.35 In relation to excavated material removed during the grid connection network installation, any earthen (sod) banks to be excavated will be carefully removed and stored separately, maintained and used during reinstatement. Surplus excavated material from roadways will be reused if suitable or disposed of to a licenced waste facility.

5.36 If any, Prior to the transfer of soil and stone material from the site to a specific waste permitted site, the available data should be submitted to the permit holder to confirm the suitability of the material for the transfer to a waste facility.

Operational Phase

5.37 No significant operational waste generating activities are proposed at the site.

5.38 In order to comply with national and regional legislation and guidance the development will ensure that the following wastes are managed on site:

- Dry Mixed Recyclables (DMR) – includes cardboard, paper, plastic packaging and bottles, aluminium cans, tins and Tetra Pak cartons;
- Mixed Non-Recyclable (MNR) / Residual/ General Waste;
- Organic waste – to include both food waste and the limited quantities of green waste, and;
- Glass.

5.39 In addition to the typical waste materials that will be generated on a daily basis, there will be some additional waste types generated in small quantities that may on occasion need to be managed separately including:

- Batteries;
- Waste electrical and electronic equipment (WEEE);
- Chemicals (solvants, pesticides, paints, adhesives, resins, detergents, etc.);
- Fluorescent tubes and other mercury containing waste, and;
- Furniture (and from time to time other bulky wastes).

5.40 Wastes should be segregated into the above waste types to ensure compliance with waste legislation and guidance while maximising the re-use, recycling and recovery of waste with diversion from landfill wherever possible.

6 WASTE MANAGEMENT

Construction Phase

Waste Management

6.1 Waste is to be segregated on site where practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. The site waste storage area will have skips and recycling receptacles for all recyclable wastes. Collections for these will be as usage required. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Clare Region that provide this service.

6.2 All waste arising's will be handled by an approved waste contractor holding a current waste collection permit. All waste arising's requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required. Written records will be maintained by the contractor(s) detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR/permit or licence for the receiving waste facility for all waste removed and disposed off-site.

6.3 The above information will be retained for a minimum of 3 years and will be made available for review by the regulating authorities should they request it.

6.4 Dedicated bunded storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc., if required.

Soil: The Waste Management Hierarchy (illustrated in Plate 1) states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling/recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option of prevention and minimisation is not an option. Therefore, excavated soil will be reused where possible.

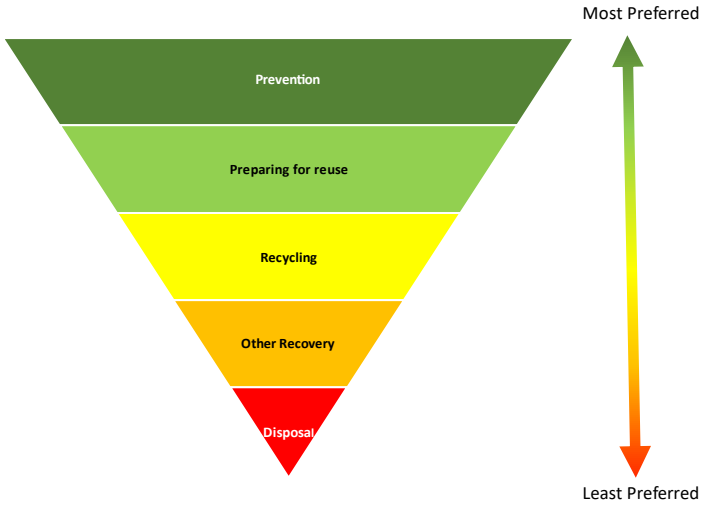

Plate 1 : EPA Waste Hierarchy

It has been estimated that the volume of materials to be cut will be will be approximately **100,744m³** of topsoil, inclusive of Option A grid connection and **101,091m³** of topsoil, inclusive of Option B grid connection. In the event that this material cannot be reused on site, excess material may require removal offsite for reuse, recovery and/or disposal, as appropriate. When this material is removed off-site it could be reused as a by-product (and not as a waste), if this is done, it will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*. Article 27 requires that certain conditions are met and that by-product decisions are made to the EPA via their online notification form.

If the material is deemed to be a waste, soil disposal will be carried out by contractors licensed under the Waste Management Act 1996, the Waste Management (Permit) Regulations of 1998 and the Waste Management (Collection Permit) Regulations of 2001. All soil will be classified in accordance with Council Decision 2003/33/EC and disposed of in accordance with its hazard category in fully EPA/local authority licensed disposal facilities.

Bedrock: Excavated bedrock will be encountered during excavation works. This will be taken off site crushed and returned to site for reuse in access track construction and as a fill material. The estimate of rock excavated is, **15,363m³** of rock inclusive of Option A grid connection and **15,363m³** of rock inclusive of Option B grid connection.

Concrete Block, Bricks, Tiles, Hard Plastic, Glass, Plasterboard and Ceramics:

If undamaged and in a suitable condition for reuse, these materials will be cleaned and segregated for recycling and stored in suitably covered skips for

collection by licensed contractor. Damaged/unsuitable materials may be further processed offsite for use as a recycled aggregate at a permitted/licensed site.

Metal: Metals will be segregated into mixed ferrous, aluminium cladding, high grade stainless steel, low grade stainless steel etc., where practical and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Timber: Any uncontaminated timber, i.e. free from paints, preservatives, glues etc., will be segregated for recycling and stored in suitable covered skip for collection by licensed contractor. Contaminated wood will be stored in a separate skip.

Waste Electrical and Electronic Equipment (WEEE):

Any WEEE will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling.

Other Recyclables:

Other recyclables including, but not limited to, soft plastics, cardboard, and packaging will be segregated for recycling and stored in suitably covered skips for collection by licensed contractor.

Non-Recyclables:

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. At regular intervals and prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the site staff to ensure that there are no recyclable wastes.

Hazardous Waste:

On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and/or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

It should be noted that until a construction contractor is appointed it is not possible to provide information on the specific destinations of each waste stream. Prior to commencement of development and removal of any waste offsite, details of the proposed destination of each waste stream will be provided to CCC by the project team.

Tracking and Documentation for Off-Site Waste

6.5 All waste will be weighed (on-site or at receiving facility) and documented prior to leaving site. Records will be kept at the site and at the relevant waste facility. Movement of waste will be in accordance with relevant guidelines.

6.6 Construction and Demolition municipal waste will be separated and stored wherever possible and monitored / inspected by the site foreperson at regular intervals and prior to removal to ensure that site protocol for recycling is being adhered to.

Roles / Training for Waste Management and Site Crew

Waste Manager

6.7 A dedicated waste manager will be appointed to ensure commitment efficiency and site protocols upheld during construction stage. The role of the waste manager will be to record, oversee and manage everyday handling of waste on the site.

6.8 Their training will be in setup and maintaining record keeping systems and how to produce an audit to ensure waste management targets are being met. They shall also be trained in the best methods for segregation and storage of recyclables. They will also be familiar with the suitability of material reuse and know how to implement the C&D RWMP.

Site Crew

6.9 This will be the responsibility of the competent waste manager/representative and a training programme will be organised, incorporated into typical onsite inductions to give an awareness of waste segregation on the site. This will outline how best to manage waste produced on site to ensure it is being handled in compliance with the RWMP, relevant legislation and in manner that prevents any impact to human health or the environment.

6.10 Toolbox talks with site staff and contractors that remind staff of their waste responsibilities should be regular. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

Record keeping

6.11 Records will be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the construction waste arising's on site. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times.

6.12 The waste manager or delegate will record the following;

- Waste taken for reuse off-site;
- Waste taken for recycling;
- Waste taken for disposal; and
- Reclaimed waste materials brought on-site for reuse.

6.13 For any movement of waste, a docket and chain of custody shall be signed and recorded by waste manager, detailing type and weight of material and source or destination. This

will be readily comparable with all delivery records to site, so a waste generation percentage for each material can be determined.

Outline of Waste Audit Procedure

6.14 It is recommended that the appointed Waste Manager should be responsible for conducting waste audits of the site during the construction / demolition phase.

6.15 The audit should consist of a review of all records for waste generation on site and the transportation of waste on and off site.

6.16 All waste movements should be recorded, and the details of these transfers should be compared with the established recovery / reuse / recycling targets for the site.

6.17 In the event of waste that is unaccounted for and / or targets for the site are not being met, the Waste Manager shall undertake a detailed review of how waste is managed on site to identify the cause. The Waste Manager will then be responsible for implementing any required appropriate actions to resolve any identified issues.

6.18 Upon competition of the C&D phase of the works, a final report will be prepared which details how waste was managed over the course of the project and that summarises the overall performance of the site against the established targets.

Consultation with Relevant Bodies

Local Authority

6.19 Once a construction contractor has been appointed and prior to removal of any waste materials offsite, details of the proposed destination of each waste stream will be provided to Clare County Council upon request.

6.20 Clare County City Council will also be consulted, as required, throughout the excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

Recycling/Salvage Companies

6.21 Companies that specialise in C&D waste management will be contacted to determine their suitability for engagement. Where a waste contractor is engaged, each company will be audited in order to ensure that relevant and up-to-date waste collection permits and facility COR/permits/licences are held.

6.22 In addition, information regarding individual construction materials will be obtained, including the feasibility of recycling each material, the costs of recycling/reclamation and the means by which the wastes will be collected and transported off-site, and the recycling/reclamation process each material will undergo off site.

Waste from Site Preparation

6.23 A significant quantity of the potential waste generated on site can be reduced by specifying the reuse of certain materials generated during excavation works.

6.24 All suitable non-hazardous excavated/cut material will be reused on site where possible, i.e. to level out ground in specified areas and/or for landscaping. Any excavated waste that cannot be reused shall be handled and transported from site by an appropriately registered contractor.

6.25 Where excavated waste may not be immediately suitable for reuse, any treatment to make this waste suitable for reuse will be undertaken through an appropriately permitted/licensed mobile plant waste processing facility that complies with the relevant legislation.

Waste Management Conclusions

6.26 Waste generated on site will be managed in an appropriate manner and in a sustainable way. The principles of the waste hierarchy will be complied with to ensure the environmental risks are minimised and the policies of Clare County Council are adhered to.

6.27 This Resource Waste Management Plan is an outline strategy only at this stage of the development. As each phase of the development progresses, more detailed Site Waste Management Plans and Material Management Plans will be developed.

6.28 This strategy has taken into account the need to lessen the overall impact of waste generation through minimisation, reuse and recycling of materials from both the construction phase.

Operational Phase

Waste Management

6.29 Traditionally, local authorities have rolled out blanket schemes for recycling and food waste collection. This means that a single type of scheme is unlikely to provide the most effective recycling solution for this development. The developer will therefore provide the most appropriate facilities for waste and recycling management based on the needs of each block.

6.30 RSK recommends the following regarding this development;

- Waste storage issues should be considered at the initial design stage to ensure access for all (including people with disabilities) in a brightly lit (a minimum Lux rating of 220 is recommended), safe and well-designed area, spacious enough for easy manoeuvrability, good ventilation and ready access if required for the control of potential vermin.
- Where storage is provided in a basement area, sufficient access and egress must be provided to enable receptacles to be moved easily from the storage area to an appropriate collection point on the public street nearby. i.e. Passageways and doors to be wide enough, no steps between waste storage area and collection point and as small an incline as possible to allow easy movement of containers. As short a distance as possible between storage area and collection point.
- Suitable wastewater drainage points should be installed in the receptacle storage area for cleaning and disinfecting purposes. There should be a floor sloped to a central foul drain and a hot and cold-water supply to facilitate cleaning and disinfection of bins. This is standard practice and should be included.

6.31 In addition, the following will be considered:

- A weekly collection of waste will be undertaken. The maximum length of time between any two collections will be 7 days.
- Special consideration around the waste storage facilities may be required for any expected ageing staff or for those with limited mobility.
- Floors within waste storage areas will be fitted with a non-slip floor surface;
- There will be suitable access and egress to waste storage areas to enable bins to be moved easily to/from collection point with no steps and minimal incline ramp (the gradient should not be steeper that 1:12).
- Bins will comply with IS EN 840 1997. The bin dimensions outlined within the table 10.2.1 below will be considered when planning waste storage areas. In addition to the bins listed, further consideration will be required for the storage of the additional containers and bags for other recyclables.
- All surfaces that containers need to move over shall be of a smooth continuous finish and free from steps or other obstacles. Steps shall incorporate a drop-kerb.
- Any waste area should ideally be located clear of any road, pavement and cycleway.
- Bin store doors must be lockable with access only available to authorised people. Bin store doors should be wide enough to allow bins to be removed for emptying and with doors that can be secured in the open position to allow safe movement of bins. Arrangements will need to be agreed with the council/waste contractors with regards to collection.
- Provision will be provided for the collection of glass within the development. 660 litre containers have been suggested. Should a bottle bank be required then considerations for the total footprint of each bank required will need to be considered. The guidance suggests the footprint to be 4 metres by 2 metres wide and they must be located externally with sufficient access and clearance for servicing using a crane.

Waste Collection

6.32 Only companies who are approved and hold a waste collection permit from Clare County Council will be considered for the collection of the waste stored in the Waste Storage Area (WSA). This will ensure that wastes are collected and disposed of at an approved facility.

6.33 Non-recyclable waste, dry recyclable waste and organic waste will all be collected weekly, with a period no greater than 7 days between each collection. All waste storage bins will be presented for collection in a manner that will not create a hazard to traffic. Records of the waste collections will be maintained by the facilities management company for the development.

6.34 The size, design and bin type may vary depending on the waste storage receptacles provided by the appointed waste contractor(s). However, typical dimensions of waste receptacles used in the WSAs are shown in Table 5.1 below. Examples are shown in Figure 5.1.

Table 6-1: Waste Container Dimensions

Container Type	Size (litres)	Dimensions (height x width x depth in mm)
1100 litre 'Euro' bin (4-wheel bin)	1,100	1380 x 1270 x 1000
660 litre bin	660	1340 x 1200 x 700
240 litre standard bin	240	1075 x 580 x 715

Figure 5.1: Typical Waste Receptacles

6.35 Each bin/container will be clearly labelled and/or colour coded to avoid cross contamination of the different waste streams. Signage will be posted above and/or on the bins to show exactly which waste types can be placed in each bin. Dry Recyclable, non-recyclable, organic and glass waste bins will be required to be collected/emptied twice a week.

6.36 Access for vehicles will be designed in accordance with the requirements laid out by BS 5906:2005 Waste management in buildings — Code of practice. This will be dealt with at the detailed design stage.

6.37 Access to the waste storage area should be restricted to tenants and facilities management only. The areas will be suitably screened from public view and restricted to access by authorised personnel only. Access by the appointed waste contractor will need to be arranged.

7 CONCLUSIONS

Construction Phase

Conclusions from the Construction Phase

7.1 It is recommended that the Principal Contractor with responsibility for the overall scheme register with the “Considerate Contractors Scheme”.

7.2 A more detailed Resource Waste Management Plan will be produced prior to development taking place that provides further details around how waste will be managed on site. Resource Waste Management Plans demonstrate appropriate waste management controls during the different construction phases of the proposed development.

7.3 Good practice measures in relation to on-site storage and security of raw materials and waste should be implemented, specifically for the segregation of waste to aid recycling, and for waste and materials to be safely and securely stored on site.

7.4 Opportunities to further reduce waste arisings and increase recycling rates from the proposed development have been identified to ensure it contributes to an improved waste management performance.

7.5 Appropriate targets should be set in relation to the minimisation and recycling of any construction waste materials to be agreed between the developer and principal contractor with agreed methodologies for waste quantification and monitoring.

Operational Phase

Conclusions from the Operational Phase

7.6 Waste generated on site will be managed in an appropriate manner and in a sustainable way. The principles of the waste hierarchy will be complied with to ensure the environmental risks are minimised and the policies of Clare County Council are adhered to.

7.7 The development will, as a minimum, incorporate adequately sized internal or external waste and recycling storage areas for dry recyclable, non-recyclable, organic and glass waste containers.

7.8 This Resource Waste Management Plan is an outline strategy only at this stage of the development. As each phase of the development progresses, more detailed Site Resource Waste Management Plans can be developed in conjunction with development operators.

Orsted

Proposed Oatfield Wind Farm

Construction Environmental Management Plan

Appendix D – Water Quality Monitoring Plan

604569 WQMP

DECEMBER 2023

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1 INTRODUCTION

1.1 This Water Quality Monitoring Plan (WQMP) forms part of the Construction Environmental Management Plan (CEMP) for the Oatfield wind Farm Project (the Proposed Development) in Co. Clare.

1.2 The WQMP sets out the minimum monitoring requirements which must be implemented during the :

- Construction of the Development
- Operation of the Development
- Decommissioning of the Development

1.3 The WQMP should be considered a live document and is to be updated by the Contractor at the commencement of the Project and on a quarterly basis thereafter, or as more frequently as the need arises to ensure that it is current and has the most up to date information.

1.4 A copy of the WQMP and any updates shall be maintained on site as part of the Environmental Clerk of Works (ECoW's) Environmental Management System.

1.5 An electronic copy of the ERP and any updates shall be provided to the following:

- Oatfield Wind Farm Project office
- Clare County Council Planning Department
- Inland Fisheries Ireland
- Contractor
- All sub contractors working on the project.

1.6 The EnvCoW shall maintain a record of all versions of the WQMP issued.

2 PROJECT DESCRIPTION

Site Location and Plan

2.1 The site of the Proposed Development is located in the Oatfield and Gortacullin areas. At the nearest point, the Proposed Development site is approximately 1.3km to the South of Broadford, 4.7km to the East of Sixmilebridge in East Clare, 7.6km North of Ardnacrusha, approximately 9.2km North of Limerick, and 19.7km South of Ennis.

The Proposed Development site boundary (which is the planning boundary) includes:

- Two distinct areas; the Western Development Area (Western DA) (approximately 153 hectares) and the Eastern DA, (approximately 139 hectares) comprising of a total land area of approximately 296 hectares which principally consists of conifer plantation, transitional woodland scrub, mixed forest, pastures, agricultural lands, and peat lands. Refer to Figure 2.1.
- IPP connection route from the Eastern DA to the 110kV substation located in the Western DA: The IPP cables will be installed within the body of the local public road network and in the public access trackway near the Western DA. The IPP connection route is illustrated in Figure 2.1 also. The overall length of this interconnecting IPP cable route is approximately 10.6km.
- Electrical energy generated from the wind farm will be exported from the proposed 110kV Substation located in the Western DA to the national grid via underground double circuit grid connection cables to the existing overhead 110kV lines at Ballycar North, County Clare. Two options for the interconnection with the Overhead line are proposed. Option A is a Loop in to the existing Ardnacrusha – Ennis 110kV Overhead line at Ballycar North and Option B is a Loop in to the existing Ardnacrusha – Drumline 110kV Overhead line also at Ballycar North. Once it leaves the Proposed Development site, the 3.9km grid connection infrastructure will be installed within the body of the public road network along the route illustrated in Figure 2.2.
- An area of land take required for accommodation works along the proposed turbine delivery route from Foynes Port to the Proposed Development Areas site (see Section 5.2.8.4 of Chapter 5: Description of the Proposed Development for further details).
- Existing land use in the area comprises coniferous forest, mixed forest, transitional woodland scrub, pastures, agricultural lands, and peatlands. Details of the land use type associated with the Proposed Development is included in Table 2.1 below.

Description of the Development

2.2 The Proposed Development will consist of the following project elements:

- 11 no. three-blade wind turbines with an overall ground to blade tip height range of 176.5m to 180m, a rotor diameter range of 133m to 150m and a hub height range of 105m to 110m;

- Construction of associated reinforced concrete foundations, crane pad hard-standing areas and associated plant/switching gear;
- Construction of new permanent, internal site tracks and upgrading of existing tracks and associated drainage infrastructure including a clear-span bridge (circa 10m length), concrete culverts and the installation of an on-site Sustainable Drainage System (SuDS);
- 2 no. temporary spoil storage areas: one in the western development area and one in the eastern development area;
- Erection of 1 no. permanent meteorological mast in the western development area with a height of 100 m above existing ground level;
- All associated internal, underground electrical and communications cabling connecting the wind turbines to an on-site substation located in the western development area;
- Provision of underground interconnecting 33kV IPP cabling and underground cable joint bays circa. every 750-1,000m for circa. 10.4km (joining eastern and western development areas) within the public road network including the R471;
- Provision of 1 no. 110kV onsite substation and parking in the western development area (Townland of Oatfield), along with associated control and switchgear building, associated electrical plant and equipment, associated security fencing, external lighting and lightning protection, security cameras and all associated infrastructure;
- All works associated with the connection of the wind farm to the national electricity grid, which will be via a loop-in 110kV underground cable connection (circa. 4.3km cable length and joint bays circa. every 750m), to the existing 110kV overhead line in the townland of Ballycar North, with 2 no. new 16m steel lattice end masts & associated overhead line electrical infrastructure, located at the interface with the existing 110kV overhead line;
- 2 nos. temporary construction compounds, including offices/meeting rooms, parking and transformer;
- 10 no. individual site access points and tracks to turbines, on-site sub-station, met mast, temporary spoil storage & temporary construction compound areas from the local road network/public trackway running north of the R471;
- Forest & tree felling to facilitate construction and operation of the proposed development;
- Temporary works to accommodate turbine delivery route (TDR) in the townland of Knockbrack Lower;
- All associated site development works including Construction, Operation and Decommissioning stage site-lighting, fencing and signage.

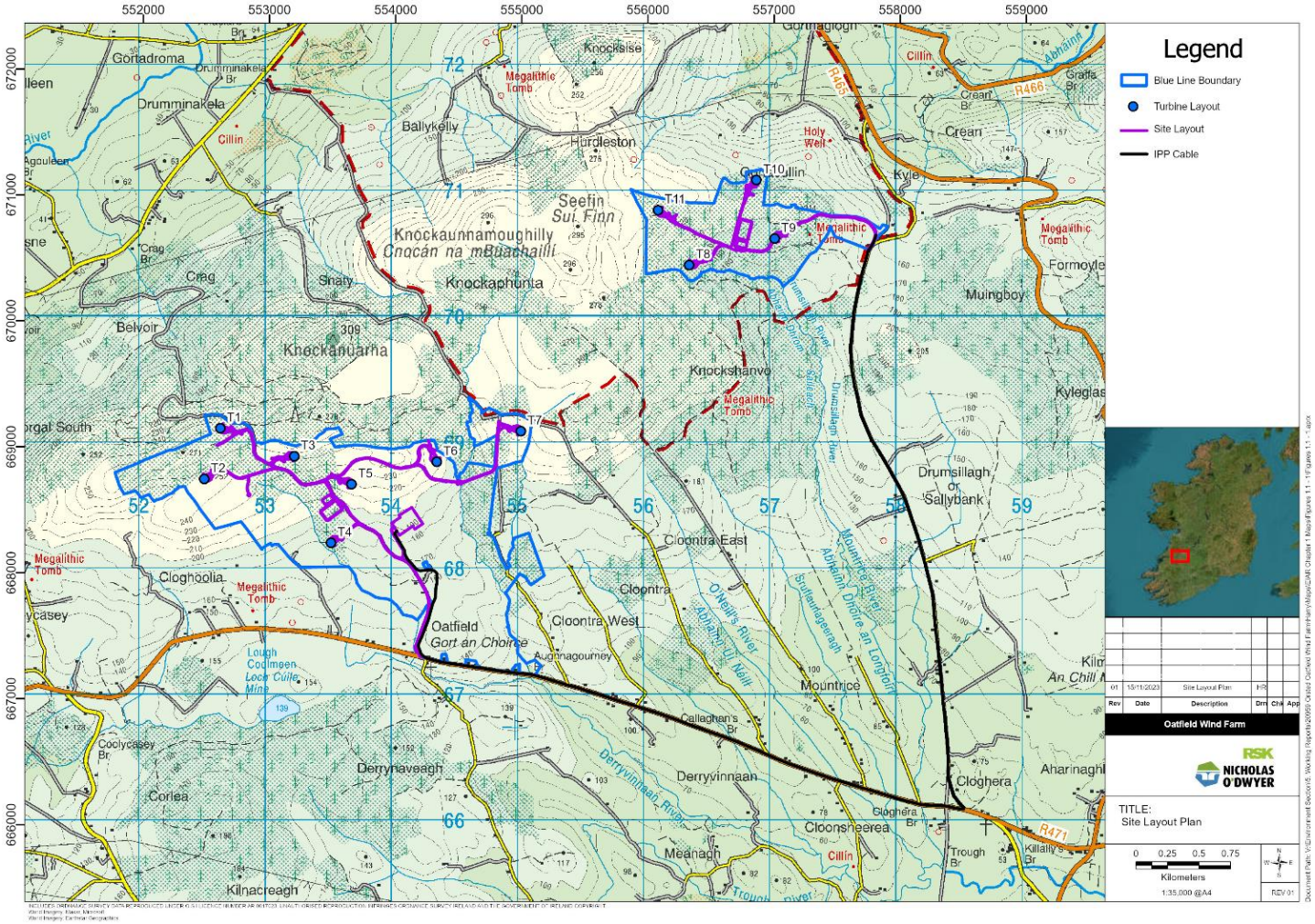

Figure 1: Proposed Development Site Location Map (Site in two parts; Western and Eastern Portions)

3 MONITORING & ENVIRONMENTAL CLERK

Environmental Clerk of Work

3.1 To ensure effective implementation of mitigation measures, environmental auditing, and monitoring of environmental obligations of the Developer, an Environmental Clerk of Works (EnvCoW) will be assigned by the Developer to carry out monitoring at the Site during the construction and operational phases of the Development.

3.2 The EnvCoW role will be to actively and continuously monitor site conditions and advise on environmental issues and monitoring compliance, and will not be responsible for implementing measures, the due duty of implementing measures will be held by the Developer / contracted construction operator.

3.3 The EnvCoW will have the authority to temporarily stop works in a particular area of the site to ensure corrective measures are implemented and adverse environmental impacts are minimised if not avoided.

3.4 Monitoring of pollution prevention and mitigation undertaken by the EnvCoW assigned by the Developer will include:

- Monitoring site pollution prevention plan.
- Water quality monitoring.
- Advising on required pollution prevention measures (as described in this EIAR) and monitoring their effectiveness.
- Liaison with local authorities in relation to pollution instances if applicable.
- Considering EnvCoW will be responsible for monitoring a broad range of environmental factors at the Site, technical monitoring and advice will be sought such as from specialist consultants as the need arises e.g., installation and website for telemetry.

Monitoring Requirements

3.5 The following measures set out in **Table 2** and **Table 3** will be implemented for Site and GCR monitoring in relation to the hydrological and hydrogeological impacts:

Table 1: General Surface Water Monitoring Requirements

Activity	**Wind farm Construction**
Monitoring Frequency	**General Monitoring Requirement**
Prior to Commencement of Construction	• A programme of water quality monitoring outlining the selected parameters and monitoring frequency will be agreed with Inland Fisheries Ireland and Clare County Council prior to the commencement of construction.

Activity	Wind farm Construction
Monitoring Frequency	**General Monitoring Requirement**
Daily during Construction Quarterly during Operation	• During the construction phase of the project, the development areas and adjacent receiving drainage systems will be monitored daily for evidence of erosion and other adverse effects to natural drainage channels and existing degraded areas whereby soils/subsoils are exposed and prone to enhanced degradation. • This monitoring will continue at a reasonable frequency during the operational phase of the development; however, it is envisaged that any potential issues in this regard will be identified and rectified during the construction phase.
Equipment on site	• Handheld meters (Turbidity / Total Suspended Solids (TSS)) will used by the EnvCoW / competent operators during construction works. This will be done with a view to managing water treatment and anticipating potential surcharges in water or TSS loading within the treatment train. • Handheld meters will also be used to monitor outfall/discharge quality in the event telemetry systems fail or during system maintenance. • A handheld turbidity meter will be available and used to accurately measure the quality of water discharging from the site at any particular location. • The meter will be maintained and calibrated frequently (per the particular unit's calibration requirements / user manual) and will also be used to check and calibrate remote sensors if they are employed.
Continuous	• Rainfall will be monitored (1 no. rainfall gauge required). This unit will be connected with and displayed with other site water quality telemetry data via the telemetry website.
Weekly during construction	• Surface water runoff control infrastructure will be checked and maintained on an ongoing basis, and stilling ponds and check dams will be maintained (de-sludge / settle solids removed) on an ongoing basis, particularly during the construction phase of the development.
Continuous	• Continuous monitoring particularly in principal surface water features draining the site will be conducted using a handheld meter by the EnvCoW.

Activity	Wind farm Construction
Monitoring Frequency	**General Monitoring Requirement**
	• Monitoring of potential hydrological effect of the development, particularly during the operational phase will be inherently linked to the ecological health of the site (as a functioning ecosystem) and therefore both hydrology (by handheld monitoring device by the environmental clerk of works) and ecology will be considered and monitored in tandem. For example, effects to the hydrological regime at the site can potentially effect on the ecological health or characterisation of the site, and vice versa. Ecological indicators can potentially provide useful data in relation to the long-term effect of changes to the hydrological regime at the site. Changes to the management of runoff and in turn the hydrological regime at the site will lead to a positive effect overall when compared to the baseline conditions associated with the site e.g. introduction of intermittent buffered outfalls along the length of the drainage network is in contrast to baseline, this will promote a more even distribution runoff, attenuate runoff and reduce the hydrological response to rainfall, enhanced potential for recharge to ground, and in various areas of biodiversity enhancement.
Duration of construction and post construction for a 12 month period on a monthly basis	• Similar to the wind farm site baseline monitoring, baseline surface water samples will be obtained at upstream and downstream sampling locations at each significant construction location over mapped rivers. • Baseline surface water samples will be obtained at accessible locations such as existing bridges on public roads. Where upstream access is poor, the upstream baseline sampling location will be directly/immediately upstream of the construction location (e.g., existing bridge / culvert).

Table 2: Specific Surface Water Monitoring Requirements

Activity	Wind Farm Site Construction
Monitoring Frequency	**Specific Monitoring Requirement**
Monthly	• The baseline monitoring undertaken at the Site as part of this study, see surface water sampling sites SW1 to SW4 on Figure 2, will be repeated periodically before, during and after the construction phase of the Development to monitor any deviations from baseline water quality that occur at the Site. This monitoring along with the detailed monitoring outlined below will ensure that the mitigation measures that are in place to protect water quality are working.
Daily	• Daily inspection of silt traps, buffered outfalls and drainage channels
Daily	• Daily measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations on the Site (Figure 9.6) (locations close to active working zones).
Continuous	• Monitoring of total suspended solids, electrical conductivity, and pH during times when excavations are being dewatered (likely high in solids) will be done in real time by the EnvCoW using handheld meters on site.
Continuous	• Monitoring will be carried out as part of Active Management of construction water management and treatment by the EnvCoW using handheld meters on site. (**Figure 3**). • A small degree of tolerance above reference concentrations is acceptable at this location but only if the discharge from the Active Management train discharges to another Passive Management system or to a non-sensitive vegetated area. • If discharging within sensitive areas or buffer zones, the quality of discharge from the Active Management train will be in line with prescribed reference limits (e.g., 25mg/l TSS)
Continuous during the Construction Phase	• Continuous Monitoring at downstream Baseline SW Monitoring Locations (SW1 to SW 11 **Figure 2**) will be carried out using telemetry during the construction phase.

Activity	Wind Farm Site Construction
Monitoring Frequency	**Specific Monitoring Requirement**
Continuous during the Operational Phase until stable conditions reached	• Triggering of the threshold at these locations will trigger emergency response and escalation of measures including immediate full site inspection to ascertain to the potential unknown source (bearing in mind that the quality of managed runoff at the site will be known by means of live telemetry and handheld meters). • Continuous monitoring at Baseline SW Monitoring Locations will continue into the operational phase until stable conditions are observed e.g., stable conditions in line with baseline conditions for 6 months.
Daily during Construction Weekly during Operation	• During the construction phase of the project, the Development areas will be monitored daily for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system so that it does not become blocked, eroded or damaged during the construction process. • This monitoring will continue at a reasonable frequency (weekly initially gradually reduced based on observed stability of conditions) during the operational phase of the Development, however it is envisaged that any potential issues in this regard will be identified and rectified during the construction phase
Daily during Construction Weekly during Operation	• During the construction phase of the project, the Development areas and adjacent receiving drainage systems will be monitored daily for evidence of erosion and other adverse impacts to natural drainage channels and existing degraded areas whereby soils/peat are exposed and prone to enhanced degradation. • This monitoring will continue at a reasonable frequency during the operational phase of the Development, however it is envisaged that any potential issues in this regard will be identified and rectified during the construction phase
Continuous during Construction	• Site water runoff quality at all surface water monitoring locations will be monitored on a continuous basis during the construction phase of the Development. • Monitoring will continue into the operational phase until such time that the Site and water quality have stabilised (stable conditions in line with baseline conditions for e.g. 8 consecutive quarterly monitoring events). This monitoring will

Activity	Wind Farm Site Construction
Monitoring Frequency	**Specific Monitoring Requirement**
	be carried out at the downstream surface water baseline sampling location (**Figure 2**)
Continuous	• Telemetric Monitoring Systems (TMS) will be used a key part of Active Management of runoff and construction water at the HDD points on GCR, as presented in Appendix 9.5 – Tiles 7 to 9. • Monitoring of HDD Points will have, remote sensing, or telemetric monitoring sensors (turbidity) will be employed in this regard. • Continuous Monitoring Locations or Telemetric Monitoring Stations (TMS) will use probes to monitor the following parameters: • Electrical Conductivity • Turbidity (Data obtained can be equated to estimated Total Suspended Solids (TSS) through calibration) • pH • Temperature • Capacity for additional probes. • TMSs will be self-powered and will be comprised of the following components at a minimum: • Remote Telemetry Unit (RTU) – Modem / data hub and transmission. • Solar panel • Sensor – pH • Sensor – Turbidity • Sensor – Electrical Conductivity • Sensor Cleaning Device (SCD)(Turbidity probe) • Power Management Unit (PMU) • Power Bank (PB) • Website – presenting data trends over time. • Metal stand / frame and protective fencing. • The TMS will have capacity for additional parameters. • Telemetric continuous monitoring sampling frequency is generally set at one data point per 15 minutes, however considering the intensive

Activity	Wind Farm Site Construction
Monitoring Frequency	**Specific Monitoring Requirement**
	nature of the proposed works, particularly drilling activities, if possible it is recommended that sampling frequency is set at 5 minutes or less with a view to escalating responses to potential discharge quality issues in good time. • Data is to be transmitted to a project website which will display data trends over time. • Access to the website is to be provided via a website link. • Telemetry monitoring systems will travel with the active construction areas on the GCR / remain with the Active Management infrastructure. • The purpose of this is to recycle water if quality is unfavourable and adjust the dewatering and treatment train accordingly until discharge quality is observed to be acceptable.
Monthly during construction and for a period of 12 months post construction	• At Horizontal Directional Drilling (HDD) locations, any mapped wells identified in HDD groundwater buffer zones (250m) will be monitored to establish baseline, and routinely monitored during the construction and for a period into the operational phase of the development.
Daily during Construction Weekly/Monthly during Operation	• During both the construction and operational phases of the project watercourse crossings will be monitored frequently (daily during construction and intermittently during operational phase i.e., weekly / monthly inspections initially and reduced gradually in line with observed stability and confidence in longer term data obtained. • The water course crossings will be monitored in terms of structural integrity and in terms of their impact on respective watercourses.
	• Monitoring will be carried out at each significant construction location (HDD, any excavation >2.0m) and at significant environmental receptors including the following Environmental Monitoring Locations; ○ Upstream and downstream of surface water crossings on mapped rivers. ○ • Physiochemical properties will be monitored in real time by means of alarmed telemetry e.g., telemetric monitoring at baseline sampling locations and alarm thresholds established in line with water quality reference

Activity	Wind Farm Site Construction
Monitoring Frequency	**Specific Monitoring Requirement**
	concentrations/limits which will be set using relevant instruments for example, Surface Water Quality Regulations, <25mg/l Total Suspended Solids (TSS) • Monitoring proposed will be specified relative to the particular activity and associated risk at respective locations. • All abstraction points associated with groundwater source protection areas and within Regionally Important Karst aquifers associated with the development will be monitored with the same frequency.
Likely Daily or Weekly if required.	• Where a discharge licence is required, the conditions of the licence will stipulate monitoring requirements in line with licence parameters with associated emission limit values. • The frequency of sampling will likely be daily or weekly. Sampling will include obtaining physical samples at an agreed discharge sampling point and will be sent an accredited laboratory for analysis. • Where discharge licence is required, monitoring in line with the licence will be done in addition to the other monitoring regimes undertaken as described in sections above. Monitoring under licence conditions will not negate the requirement for the other regimes described.
Monthly or after heavy rainfall events (defined as >10mm rain	• Post construction: at a monthly or after heavy rainfall events (>10mm of rain) inspection of silt traps, buffered outfalls and drainage channels, measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations at the site. • During the operational phase of the project the stilling ponds and buffered outfalls will be periodically inspected during maintenance visits to the site.
Weekly during Operation	• During the operational phase of the project the stilling ponds and buffered outfalls will be periodically inspected e.g., weekly during maintenance visits to the Site initially and gradually reduced based on observed stability of conditions.

Managing & Reporting Environmental Incidents

3.6 Environmental incidents including accidental spillages on soils (e.g. fuel), breeches of thresholds (environmental quality standards – TSS exceeding 25mg/l), and significant environmental incidents will be reported to the Local Authority as part of emergency responses to such incidents. Incident notification will be escalated to relevant third parties where relevant e.g. Inland Fisheries Ireland (IFI) if surface water receptors are intercepted.

3.7 Monitoring at downstream baseline Surface Water (SW) monitoring locations (**Figure 2**), will be undertaken by the Environmental Clerk of Works in accordance with tthis SWQMP.. If any the thresholds are exceeded at these locations this will trigger emergency response and escalation of measures including immediate full site inspection to ascertain to the potential unknown source (bearing in mind that the quality of managed runoff at the site will be known by means of live telemetry and handheld meters),Conceptual and information graphics presented in **Figure 3** presents indicative layout and specification for both passive treatment trains (e.g., clean water and or storm water interceptor drains), active management treatment trains (management and treatment of construction water) and emergency response and intervention.

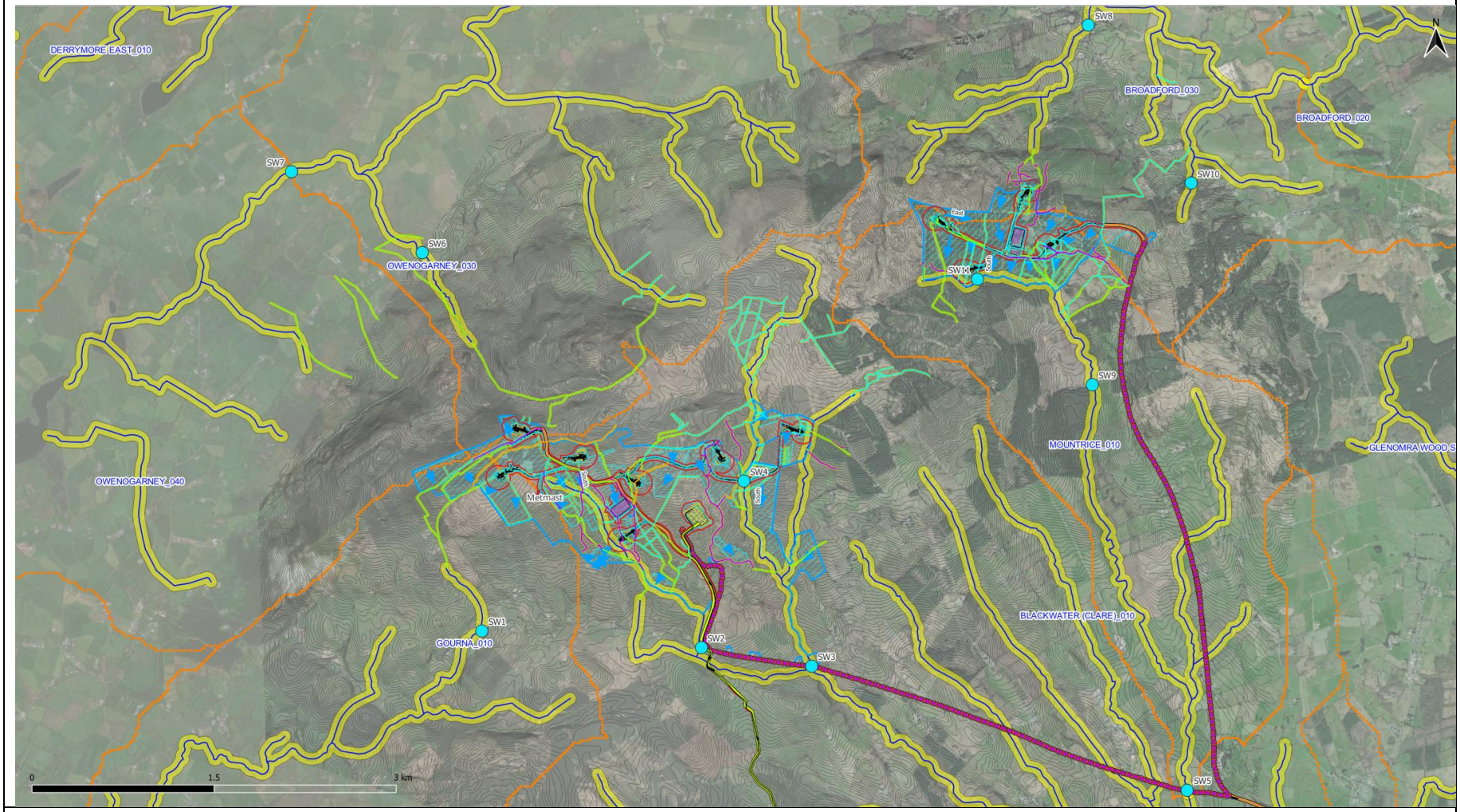

Figure 2: Location of SW Monitoring Locations (SWX).

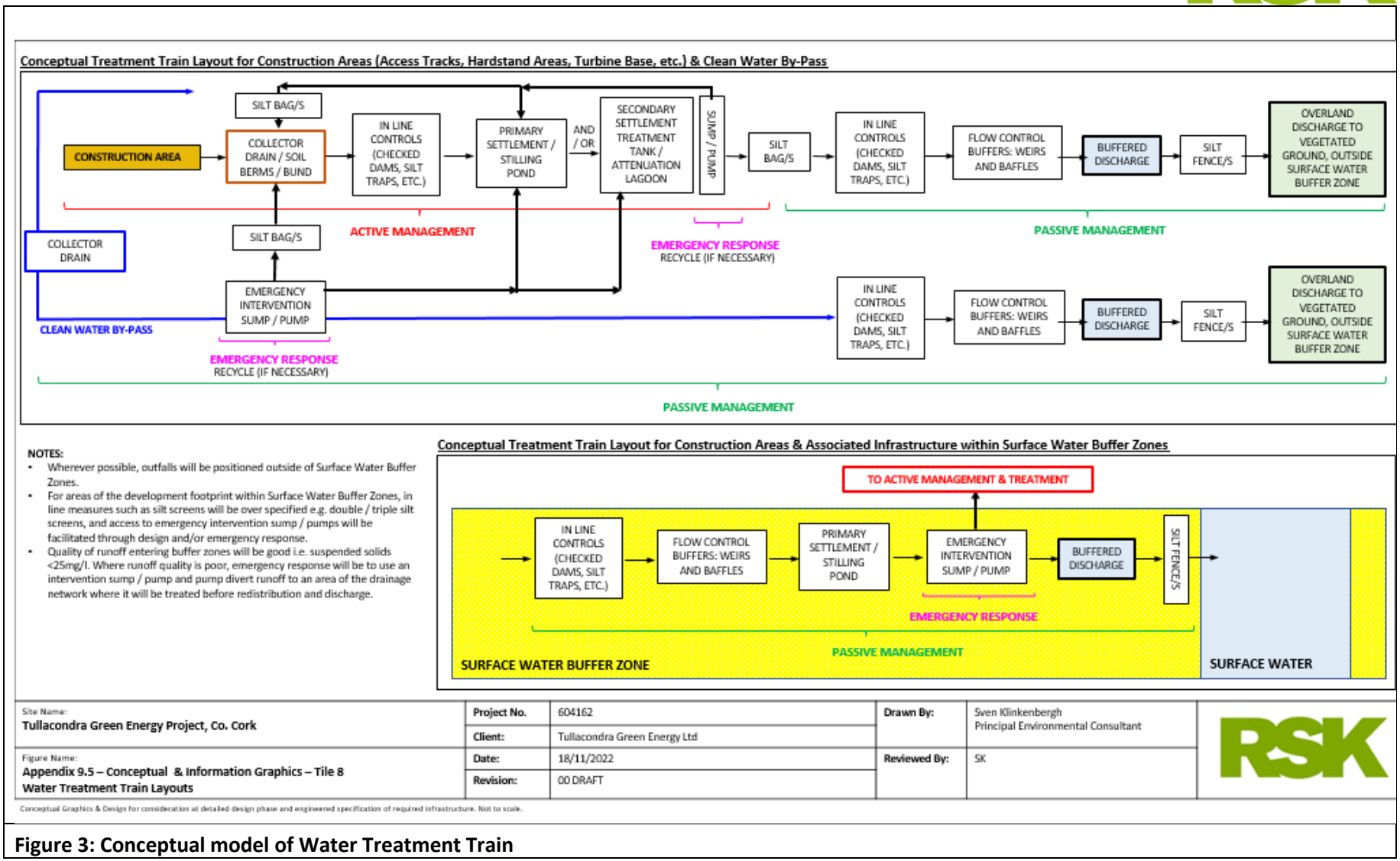

Figure 3: Conceptual model of Water Treatment Train

4 EMERGENCY RESPONSE PROTOCOLS

4.1 Prior to commencement of construction, the EnvCoW will prepare a register of corrective action and emergency response sub-contractors that can be called upon in the event of an environmental incident, and/or to give training on escalating incident where useful, including e.g., specialist hydrocarbon spill response, specialist hydrological and/or water quality response.

4.2 Mitigation will set out to minimise any potential for contaminants to reach sensitive receptors identified during the construction phase of the proposed development are encompassed in passive management of construction water, however, there remains the risk of accidental spillages and or leaks of contaminants, and excessive loading of surface water mitigation infrastructure.

4.3 EnvCoW will monitor the efficacy of mitigation measures applied, and were failing to achieve the objectives set, emergency response and mitigation measures are escalated until such time as the site stabilises and objectives of mitigation are being achieved once more.

4.4 A risk of accidental chemical spillages, sediment overloading of control measures or leaks of contaminants from plant or equipment remains a possibility. If there is any issues, active construction water management will then take place. There is a series of steps for Emergency response protocols and they are as follows.

- Monitoring by EnvCoW – threshold triggered
- Investigate and identify sources of contaminate
- Isolate the area – insert straw bales (temporary measure)
- Divert water – Pump out of drain
- Discharge to vegetated area through silt screen or stilling pond before vegetated area

4.5 All activities that could trigger an emergency response protocol are listed below, however it should be noted that each response is dependent on two key items.

- Severity of contaminant
- Volume of water

4.6 The following is a non-exhaustive list of potential emergency scenarios where corrective action may be required, and proposed corrective mitigation measures are included:

- Potential issue; Elevated concentrations of suspended solids in runoff during excavation activities during an unforeseen or low probability storm event, for example a 1 in 100-year event. Proposed measure; cover exposed stockpiles in plastic sheeting and placement of straw bales and silt fences in associated drainage channels.
- Potential issue; Failure or degradation of stone check dam during a storm event with associated elevated runoff volumes. Proposed measure; Introduction of straw bales and silt fences in order to regain attenuation

capacity of the drainage channel until the maintenance can be completed, (**Figure 4)**.

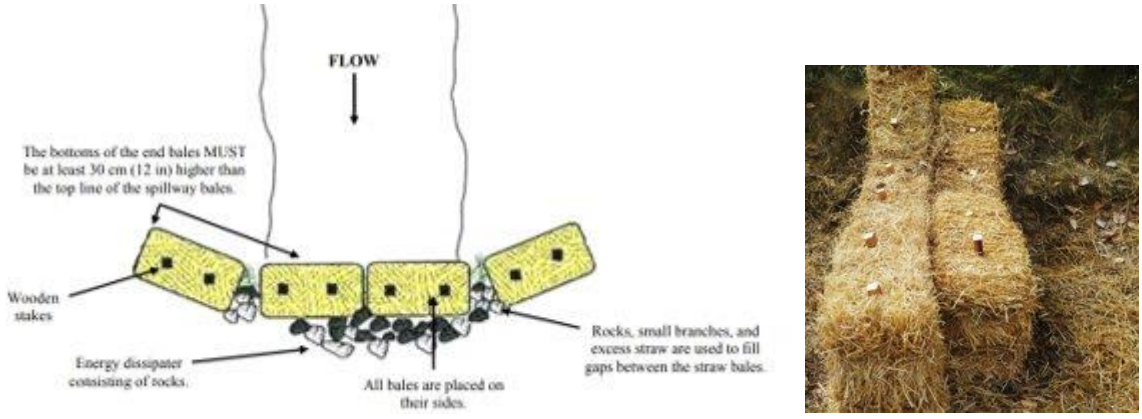

Figure 4: Straw bale retention feature

- Potential issue; Localised stability issue leading to deposit of soils/subsoils within an active drainage channel. Proposed measure; Introduction of straw bales and silt fences directly downstream, of the area in order to attenuate gross solids isolate the area and over pump until remedial works and maintenance can be completed, divert all runoff from the area to Active Management area of the treatment train (Figure 3).
- Potential issue; Management of unexpected runoff patterns leading to excessive drying or wetting in a particular area, potentially leading to enhanced erosion. Proposed measure; This type of issue will require assessment on a case by case basis. Solutions might include; decommission, modification, introduction or relocation of buffered outfall, or diversion of runoff volumes to or away from the area. In regard to the potential for erosion and similar physical processes, any such issues will become apparent through monitoring relatively rapidly, whereas effects to ecological sensitivities will become apparent relatively slowly in comparison. It is noted that much of the Site is effected as part of baseline in this regard e.g. existing artificial drainage networks.

4.7 Potential emergencies and respective emergency responses include:

- Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the proposed development. Spill kits, Appendix 9.5 – Tile 18 will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.

- Significant hydrocarbon spill or leak – In the event of a significant hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons and contaminated runoff will be contained, managed and pumped to a controlled area in line with active management including treatment through a suitably equipped treatment tank and Granular

Activate Carbon (GAC) vessels, **Figure 5**. This process will be managed by the EnvCoW in conjunction with a preidentified consultant (EnvCoW) specialist register, in regard to effective remediation, treatment and removal of hydrocarbon contaminated water and soils excavation and appropriate disposal of contaminated soils will be required in this instance.

- If a significant hydrocarbon spillage does occur, the contractor on behalf of the developer will have an approved and certified clean-up consultancy available on 24-hour notice to contain and clean-up the spill. The faster the containment or clean-up starts, the greater the success rate, the lower the damage caused and the lower the cost for the clean-up.

- Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand.

- In the event of a significant contamination or polluting incident the relevant authorities will be informed immediately.

Figure 5: Good Practice of Bunded Materials

Contingency Plan for HDD

4.8 In the event that a drilling fluid spill or 'breakout' occurs, the contractor shall cease drilling immediately, notify the Environmental Clerk of Works (EnvCoW) and Emergency Service Management Personnel (CEMP).

4.9 Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

4.10 The contractor is to draft and apply a Contingency Plan highlighting the principal HDD risks. At minimum, the contractor will have equipment and materials on standby to mitigate against the following risks associated with HDD:

- Hydro-lock (loss of fluid flow)
- A hydro-fracture incident (loss of fluid pressure)
- Fluid spill over
- Hydrocarbon/fuel spill
- Drill pipe rupture
- Borehole path failure
- Major workplace safety events in remote areas

4.11 The HDD operators will need to be equipped with straw bales, stakes to secure bales, oil booms, silt fences, sandbags, shovels, pumps, and any other materials or equipment necessary to contain and clean up and properly dispose of unintentional releases.

Oatfield Wind Farm

Proposed Oatfield Wind Farm Project

Construction Environmental Management Plan

Appendix E - Emergency Response Plan

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DECEMBER 2023

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1 INTRODUCTION

1.1 This Emergency Response Plan (ERP) forms part of the Construction Environmental Management Plan (CEMP) for the Oatfield Wind Farm (the Proposed Development) in Co. Clare.

1.2 The ERP is intended to form the basis of providing information on the emergency responses required should, emergency situations, pollution incidents or serious accident occur on the site during the following phases:

- Construction of the Development
- Operation of the Development
- Decommissioning of the Development

1.3 The Emergency Response Plan should be considered a live document and is to be updated by the Contractor on a quarterly basis, or as more frequently as the need arises to ensure that it is current and has the most up to date information and contact details.

1.4 A copy of the ERP and any updates shall be maintained on site as part of the Contractor's Health and Safety File.

1.5 An electronic copy of the ERP and any updates shall be provided to the following:

- Orsted Project office
- Clare County Council Planning Department
- All sub contractors working on the project.

1.6 The Contractor shall maintain a record of all versions of the ERP issued and to whom on the Health and Safety file on site.

2 PROJECT DESCRIPTION

Site Location and Plan

2.1 The Proposed Development is located in County Clare in the townlands indicated in Table 1 of and its location is provided in Figure 1.

Table 1: Townlands and Electoral Districts in which the proposed Project is located

Proposed development area	Townlands	
IPP Cabling connecting Eastern DA to Western DA	• Drumsillagh Or Sallybank (Parker) • Mountrice • Cloontra West • Kyle • Derryvinnaan • Cloontra East	• Drumsillagh Or Sallybank (Merritt) • Cloonsheerea • Cloontra • Cloghera • Oatfield
Western DA inclusive of turbines, site access tracks, substation, and construction compound	• Cloghoolia • Belvoir • Cloontra West • Crag	• Snaty (Massy) • Snaty (Wilson) • Cloontra • Oatfield
Eastern DA inclusive of turbines, site access tracks, substation, and construction compound	• Gortacullin • Kyle • Hurdleston • Knockshanvo	
GCR from wind farm to Loop-in substation at Ballycar	• Ballycar North • Derrynaveagh • Oatfield	

Proposed development area	Townlands			
TDR Route from Foynes Port to the Proposed Development	• Woodpark • Tooreen • Cloonfadda • O'Briensbridge • Knockbrack lower • Bohereen • Corcamore • Coolderry • Drumsillagh or Sallybank (Parker) • Lackenavea (Egremont) • Crossagalla • Huntingstown • Ballyclogh • Richhill • Mountrice • Skehacreggaun • Ballyengland Lower • Cragbeg • Cloontra West • Morgans South • Rincullia • Ballynacourty • Court • Crag • Ardaneer • Kyle • Deegerty • Ballybrack • Derryvinnaan • Lisnagry • Woodstown • Dromintobin North	• Coolnadornory • Tomdeely South • Robertstown • Blossomhill • Ballysimon (Staunton) • Killeen • Ballybrown • Carrowkeel • Gooig • Loughanleagh • Inchmore • Rathurd • Askeaton • Shantraud • Cloonlara • Bohereen • Dromlohan • Cragmore • Ross • Cloonreask • Ballyvareen • Ardataggle • Gortnalahagh • Ballysimon • Touknockane • Cowpark • Rathmale • Cloghatacka • Cloontra East • Killestry • Ardcloony • Craggs	• Sroolane • Moig South • Lackenavea (Dunalley) • Sroolane North • Knockroe • Rathbane South • Ballinacurra (Weston) • Coolbeg • Annaholty • Drumsillagh or Sallybank (Merritt) • Knockadromin • Aharinaghbeg • Newtown • Cloon and Commons • Cloonsheerea • Bunlicky • Ballyard • Cloontra • Monaskeha • Cloghera • Moys • Oorla • Rossbrien • Cooleen • Bolane • Parkwood • Glennameade • Gardenhill • Aughboy • Sallymount • Castlemungret • Currahchase North	• Garraun • Ballyduane • Ballyhomin • Ballykeeffe • Ballyvogue • Ballyengland upper • Doon • Peafield • Gortybrigane • Garraunykee • Ballinacurra (Hart) • Dromintobin South • Kildoorus • Corgrig • Kilmaglasderry • Banemore • Garrynatineel • Boherboy • Killonan • Roolagh • Oatfield • Bartleystown • Knockbrack Upper • Derreen • Coolrahnee • Crokerspark • Glenbane East • Ballyrune • Dooradoyle • Elmpark Demesne • Tomdeely North • Mountshannon

2.2 Description of the Development

2.3 The Proposed Development comprises:

- 11 no. three-blade wind turbines with an overall ground to blade tip height in the range of 176.5m to 180m, a rotor diameter in the range of 133m to 150m and a hub height in the range of 105m to 110m across the Eastern DA and the Western DA;
- Construction of associated reinforced concrete foundations, crane pad hard-standing areas, associated drainage infrastructure and associated plant/switching gear;
- Construction of new permanent site tracks and associated drainage infrastructure;
- Upgrading of existing tracks and associated drainage infrastructure;
- 2 no. temporary spoil storage areas;
- Erection of 1 no. permanent meteorological mast with a height of 100 m above existing ground levels
- Provision of underground interconnecting 33kV cabling and underground cable joint bays approximately every 1000m (joining Eastern and Western DAs) within the local public road network
- Provision of 1 no. 110kV onsite substation and parking in the Western DA, along with associated control and switchgear building, associated electrical plant and equipment, associated security fencing, external lighting and lightening protection and telecommunications masts, security cameras and all associated infrastructure;
- All works associated with the connection of the proposed wind farm to the national electricity grid via double circuit 110kV underground cabling Two Options are proposed as follows:
- Option A (loop-in to Ardnacrusha to Ennis 110kV Overhead Line via 3.83km of double circuit underground cables and joint bays every 700 m from the onsite 110kV substation to new Loop-in masts located in the townland of Ballycar North.
- Option B (loop-in to Ardnacrusha to Ennis 110kV Overhead Line via 4.16km of double circuit underground cables and joint bays every 700 m from the onsite 110kV substation to new Loop-in masts located in the townland of Ballycar North.
- 10 no. Site access entrances from the local road network running north of the R471 and R471a;
- Tree felling to accommodate the construction and operation of the proposed development. 2 nos. temporary construction compounds, including offices/meeting rooms, parking and transformer;
- All site drainage works including the installation of an on-site Sustainable Drainage System (SuDS);
- Accommodation works along the Turbine Delivery Route
- All associated site development works including Construction, Operation and Decommissioning stage site lighting, fencing and signage;

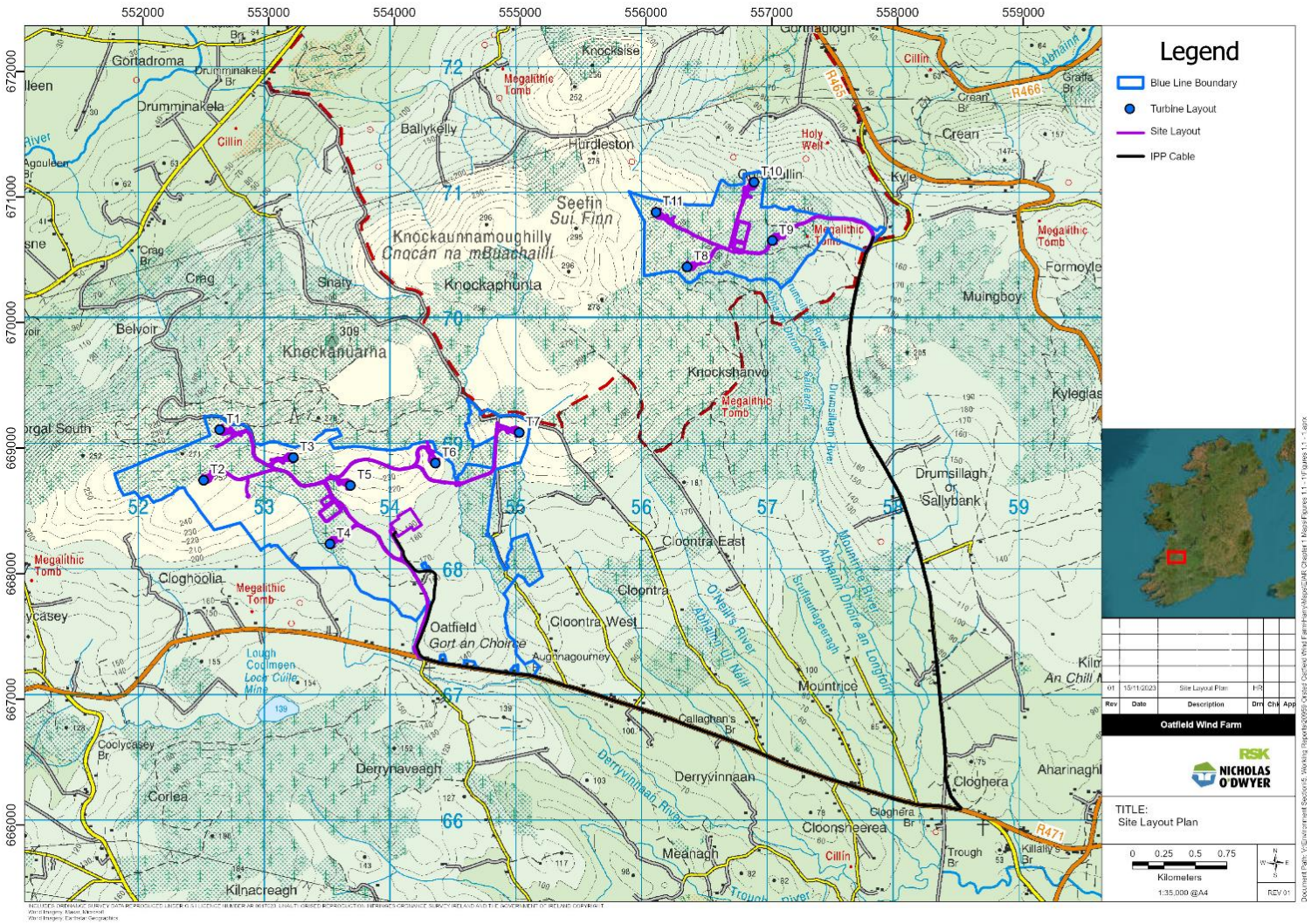

Figure 1: Proposed Development Project and Grid Connection Site Location Map

3 EMERGENCY PREPAREDNESS AND EMERGENCY RESPONSE

3.1 'Prior to commencement of construction, the Environmental Clerk of Works will prepare a register of corrective action and emergency response sub-contractors that can be called upon in the event of an environmental incident, and/or to give training on escalating incident where useful, including e.g., specialist hydrocarbon spill response, specialist hydrological and/or water quality response.

3.2 Mitigation measures as outlined in the Chapter 9 will reduce the potential for contamination of waters during the construction phase of the proposed development. However, there remains the risk of accidental spillages and or leaks of contaminants, and excessive loading of surface water mitigation infrastructure.

3.3 Potential emergencies and respective emergency responses include:

- Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the proposed development. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.
- Significant hydrocarbon spill or leak – In the event of a significant hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons and contaminated runoff will be contained, managed and pumped to a controlled area in line with Active Management including treatment through a suitably equipped treatment tank and Granular Activate Carbon (GAC) vessels. This process will be managed by the Ecological Clerk of Works (ECoW) in conjunction with a pre-identified consultant (Ecological Clerk of Works (ECoW) specialist register) in regard to effective remediation, treatment and removal of hydrocarbon contaminated water and soils Excavation and appropriate disposal of contaminated soils will be required in this instance.
- If a significant hydrocarbon spillage does occur, the contractor on behalf of the developer will have an approved and certified clean-up consultancy available on 24-hour notice to contain and clean-up the spill. The faster the containment or clean-up starts, the greater the success rate, the lower the damage caused and the lower the cost for the clean-up.
- Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand.

- In the event of a significant contamination or polluting incident the relevant authorities will be informed immediately.

Managing & Reporting Environmental Incidents

3.4 Environmental incidents including accidental spillages on soils (e.g. fuel), breeches of licence limits if applicable (discharge of trade effluent), and significant environmental incidents will be reported to the Local Authority as part of emergency responses to such incidents. Incident notification will be escalated to relevant third parties where relevant e.g. Inland Fisheries Ireland (IFI) if surface water receptors are intercepted.

Emergency Response Plan

3.5 An Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides procedures to be followed in the event of an emergency in terms of site health and safety and environmental protection.

3.6 The ERP is a working document and will require updating and submissions from the contractor/PSCS throughout the various stages of the project. Where sub-contractors that are contracted on site are governed by their own emergency response procedure, arrangements will be made to allow for inclusion of the sub-contractor's ERP within this document.

Roles and Responsibilities

3.7 The Site Manager will be responsible for activating and coordinating the emergency response procedure. In a situation where the Site Manager is unavailable or incapable of coordinating the emergency response, the responsibility will be transferred to the next person in the chain of command.

HDD break out

3.8 In the event that a drilling fluid spill or 'breakout' occurs, the Contractor will cease drilling immediately, notify the Environmental Clerk of Works (EnvCoW) and Emergency Service Management Personnel.

3.9 Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

3.10 The Contractor is to draft and apply a Contingency Plan highlighting the principal HDD risks. At minimum, the Contractor will have equipment and materials on standby to mitigate against the following risks associated with HDD1:

- Hydro-lock (loss of fluid flow)
- A hydro-fracture incident (loss of fluid pressure)
- Fluid spill over
- Hydrocarbon/fuel spill

[1] MDM (2018) "Rockabill System Specifications for Cable Installation", McMahon Design & Management Ltd. Consulting Engineers and Project Managers, Job no. 1319

- Drill pipe rupture
- Borehole path failure
- Major workplace safety events in remote areas

3.11 The HDD operators will be equipped with straw bales, stakes to secure bails, oil booms, silt fences, sandbags, shovels, pumps, and any other materials or equipment necessary to contain and clean up and properly dispose of unintentional releases.

Spill Kits

3.12 Spill kits capable of dealing with hydrocarbon and chemical spills will be available at appropriate locations on site. Each storage location shall be clearly visible to the workforce, for instance by deploying clear signage.

3.13 The spill kit contents will include absorbent pads, absorbent booms, absorbent granules and hazardous waste disposal sacks as a minimum. Regular checks of the spill kits shall be completed to ensure they remain adequately stocked to deal with environmental incidents.

3.14 Spill drills shall be performed periodically to confirm that the workforce can effectively contain and clear up potentially polluting spillages. All drills will be documented, and details kept on record for the duration of the works.

Fire Prevention

3.15 Means to raise the alarm in the event of a fire such as a siren or foghorn will be available at the points of work. An assembly point marked with a sign will be designated a safe distance from the active works locations and will be communicated to all members of the workforce before works commence.

3.16 The workforce will assemble at the point for a rollcall to be carried out by the Site Security Officer. The Site Manager will decide the appropriate course of and will advise all personnel accordingly.

3.17 All individuals on site, including visitors, will be obliged to immediately sign in on arrival.

Extreme Weather

3.18 The Site Manager will register to receive Met Eireann weather warnings. All warnings issued by Met Eireann with the potential to impact upon the works will be communicated by the Site Manager to the workforce in a timely manner so that measures can be implemented where necessary.

3.19 The Contractor will maintain provisions to deal with extreme hot weather events. Measures will include provision of safe drinking water and adequate shade.

3.20 Seasonable variations will be monitored to take account of potential wet weather when planning stripping of topsoil and excavations to minimise soil erosion and run off.

Incident Reporting and Investigation

3.21 All incidents, including near misses, will be classified according to the categories outlined below. All categories of environmental incident will be reported by the Contractor to the Site Manager as outlined in Table 2 below.

Table 2: Incident Reporting and Investigation

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. • a minor fuel spill below 20 litres onto ground which is immediately cleared; • a minor spill of a chemical not classified as presenting an ecotoxic risk; • exceeding noise levels; • silt runoff from site which does not enter into a surface water feature; or • excess dust emissions.
Major Environmental Incident	Incidents that have caused or may cause significant harm or damage to the environment e.g. • a minor fuel spill which impacts a sensitive land feature, a water body, or drains; • a major fuel spillage over 20 litres; • any spillage of a chemical which is classified as presenting an ecotoxic risk; • silt runoff from site which enters a water feature; or • receipt of a nuisance complaint.

The Contractor will 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; and,
  - 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; and,
- Lessons learned and future measures or actions to be implemented.

3.22 The Contractor will report all environmental incidents that are required to be reported to the relevant statutory or regulatory bodies.

The Contractor will 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; and,
  - 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; and,
- Lessons learned and future measures or actions to be implemented.

3.23 The Contractor will verify the incident investigation and agree with their 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 Contractor shall provide details of when they have been implemented.

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

Emergency Contacts

3.25 In the event of an emergency occurrence at the Site, the Contractor will determine the relevant statutory and regulatory bodies that must be notified. Notification will be in accordance with the measures outlined above.

3.26 A list of emergency contacts is presented in Table 3. A copy of these contacts will be included in the Site Safety Manual and in the site office.

Table 3: List of emergency contacts

Emergency Contacts	
Contact	Contact details
Client – Orsted Onshore Ireland Midco Limited	TBC prior to commencement
Project Supervisor Construction Stage (PSCS)	TBC prior to commencement
Project Supervisor Design Stage (PSDS)	TBC prior to commencement
Clare County Council Environmental Incident Report	065) 6846331, contact during out of office hours is at (065) 6821616 Email: enviroff@clarecoco.ie
Fire and Major Emergency Services Depatmnet Clare County Council, Áras Contae an Chláir New Road, Ennis, Co. Clare, V95 CD74	(065) 6821616
Clare County Council Roads and Transportation	(065) 6846313
Inland Fisheries Ireland (Incident Reporting)	0818 34 74 24
Inland Fisheries Ireland Shannon Regional Fisheries Board Ashbourne Business Park, Dock Road, Limerick	(061) 300238
EPA Incident Hotline Number (outside of business hours (09.00 – 17.00 Monday to Friday)	0818 33 55 99
EPA (Dublin)	01 268 0100
National Parks and Wildlife Service's regional office	076 100 2557
National Environmental Complaints Line (NECL)	1850 365 121
Health and Safety Authority	1890 289 389
Irish Water	1800 278 278
Emergency Services – Ambulance, Fire, Gardai	999 / 112
Bord Gáis Emergency	1850 20 50 50
ESB Networks Emergency (Overhead Wires)	1800 372 999
Killaloe Garda Station	(061) 620 540
Sixmilebridge Garda Station	(061) 369133

Incident Response

3.27 All pollution incidents will be managed through the STOP - CONTAIN - NOTIFY concept.

3.28 As soon as an incident is identified, the first action will be to STOP and prevent further discharge to drainage/river/ground.

3.29 **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.

3.30 **NOTIFICATION** will take place as soon as practicable, and frequently can take place while further release is being stopped or while a spill is being contained.

Oil, fuel or chemical spill to ground

i. Wear protective clothing, prevent further release at source e.g., switch off tap/ valve, correct leaking drum and make safe the area.

ii. If the spill is migrating, create a temporary bund to prevent further spread by using spill kit materials / sandbags.

iii. If drains or field ditches are located nearby, install drain seals/ deploy additional spill kit materials to prevent the spill discharging to the drain or ditch.

iv. Apply absorbent granules or pads (available from spill kit) to the affected area.

v. Contractor will notify the local authority regarding the nature and scale of incident. The following information should be included in the notification:

- Time of discharge;
- Type/quantity of material discharged;
- Location of discharge; and
- Site contact details.

vi. Contractor will notify the Site Manager of the incident and communicate the information provided to the local authority.

vii. Containment measures should remain in place until the nature and extent of the contamination can be assessed and a remediation strategy must be prepared.

All impacted materials shall be disposed of in accordance with relevant legislative and regulatory requirements and Duty of Care requirements.

3.31 Discovery of unexpected contamination

i. On the discovery of unexpected contamination, the Contractor will immediately halt works in the area.

ii. If impacted materials have already been removed, they shall be returned to the excavation or placed on to a membrane, e.g., terram, to prevent migration of the contaminant to another area.

iii. Contractor to report the situation to Site Manager.

iv. Arrangements will be made between the Contractor and the Site Manager for samples of the contamination to be collected and tested on fast turnaround.

v. Contractor to only continue with works in the area once the test results have confirmed the contaminant and a safe means of working has been established.

The Contractor shall be free to continue works in areas unaffected by the contamination but will not speculatively continue to excavate material to find the extent of the contamination without supervision from a geo-environmental engineer.

All impacted materials will be disposed of in accordance with relevant legislative and regulatory requirements as well as relevant Duty of Care requirements.

3.32 Oil, fuel or chemical spill to surface water feature

i. Wear protective clothing, prevent further release at source e.g., switch off tap/ valve, correct leaking drum and make safe the area.

ii. If source not readily identifiable, contain first (see below) then identify and prevent further release at source.

iii. Immediately deploy appropriately sized boom from nearest spill kit across affected surface water feature. Use stakes to attach it to the sides of the surface water feature. Tie booms together to increase length if required.

iv. Supplement with additional booms across the surface water feature, as required, to contain any migration of the spill not halted by the first installation.

v. Contractor shall notify the local authority regarding the nature and scale of incident. The following information should be included in the notification:

- Time of discharge;
- Type/quantity of material discharged to surface water feature;
- Location of discharge; and
- Site contact details.

vi. Contractor shall notify the Site Manager of the incident and communicate the information provided to the local authority.

All impacted materials will be disposed of in accordance with relevant legislative and regulatory requirements and relevant Duty of Care requirements.

3.33 Oil, fuel or chemical spill to drainage system

i. Wear protective clothing, prevent further release at source e.g., switch off tap/ valve, correct leaking drum and make safe the area.

ii. If source is not readily identifiable, contain the visible pollutant first, then identify and prevent further release at source.

iii. Immediately deploy appropriate drain cover(s) to affected gullies.

iv. Supplement with booms around the gully to contain any migration of the spill.

v. The Contractor shall notify the local authority and the relevant water company regarding the nature and scale of incident. The following information should be included in the notification:

- Time of discharge;
- Type/quantity of material discharged to the drain;

- Location of discharge, specifically which drain; and
- Site contact details.

vi. The Contractor shall notify the Site Manager of the incident and communicate the information provided to the local authority.

All impacted materials shall be disposed of in accordance with relevant legislative and regulatory requirements and relevant Duty of Care requirements.

3.34 Explosion / Fire Procedure

Explosion/fire incidents should also be dealt with through health and safety procedures. In the event that a fire is detected, or an explosion occurs:

i. Notify the emergency services and evacuate the area.

ii. Attempt to tackle the fire with site equipment only when it is safe to do so.

iii. Ensure that pollution of nearby water bodies including surface water drainage from fire control water or other substances is minimised. Where possible and safe to do so, any site drainage systems should be protected through the deployment of drain seals/ spill kit materials to ensure any firefighting waters are captured and can be disposed of appropriately.

iv. At a time when it is acceptable to do so, the local authority shall be notified regarding the nature and scale of incident. The following information should be included in the notification:

- Nature of the incident;
- Time and date of the incident;
- Quantity of fire control water discharged to surface water feature/drainage, where relevant;
- Location of discharge; and
- Site contact details.

3.35 Discharge of Silt

In the event of an unexpected discharge of silty water, then:

i. Prevent further release at source e.g., cease dewatering the excavations.

ii. Contain silt and protect sensitive receptors from further discharge:

- If a drain is located nearby, install drain seals or deploy spill kit materials to prevent discharge.
- If silt flow is in the direction of surface water features deploy hay bales around surface the feature.
- If silt is being generated by runoff from stockpiles deploy spill kit materials, silt fencing or move soil to form a bund at the base to prevent further silt laden runoff from the stockpile.

iii. If silt is discharged without prior approval the Environment Protection Agency shall be notified. If the silt discharge enters the drainage system, the relevant water company shall also be notified regarding the nature and scale of incident. The following information should be included in all notifications:

- Time of discharge;
- Type/quantity of material discharged;
- Location of discharge, e.g., which drain or surface water feature; and

- Site contact details.

3.36 Contamination of or by waste materials

i. Assess whether the area needs to be evacuated, such as if fumes are being given off.

ii. Assess whether the damage can be undone through segregation.

iii. Complete a risk assessment for the task including consideration of any COSHH risks.

iv. If it is safe to do so segregate the waste. If it is not safe to do so, then the full waste quantity is to be consigned as hazardous waste.

v. Contractor to report the incident to the client.

vi. Waste to be collected from site in accordance with normal practice.

3.37 Discovery of archaeological artefact or heritage feature

i. Immediately stop works in the area of the artefact or feature.

ii. Ensure the area is isolated from interference by erecting fencing around the discovery. Prevent vehicles from navigating through this area.

iii. Provide a safe means for pedestrians; and if possible, vehicles, to move around the isolated area.

iv. Contractor shall report the find to the client.

v. Client to arrange for the find to be assessed by a qualified heritage or archaeological specialist. Contractor to prevent tampering with the find until it has been assessed.

vi. Works to proceed in accordance with the recommendations given by the heritage or archaeological specialist.

3.38 Ecological discovery or damage

i. Immediately stop works in the area.

ii. Contractor to immediately report the incident to the client.

iii. Client to arrange for a qualified ecologist to assess the discovery or damage caused.

iv. Works to proceed in accordance with the advice received from the ecologist.

3.39 Vandalism/theft procedure

Acts of theft and vandalism present the risk that damage may be caused to equipment containing hazardous substances that could cause pollution, or damage may be caused to measures which have been installed to prevent the release of pollution. On identifying an act of vandalism or theft:

i. The Contractor shall notify Garda Síochána of the incident.

ii. Inspect all fuel storage tanks/drums and equipment to ensure there has been no release of the fuel or other hazardous substances, e.g., hydraulic fluid.

iii. If a spill is identified follow the procedures for Oil, fuel or chemical spills.

iv. Inspect pollution protection measures, e.g., drainage or silt protection, to ensure it has not been interfered with. Where it is possible, correct any issues identified without causing further release.

v. Inspect site boundaries to identify the access point if not immediately clear and secure the site.