Kildare Meath Grid Upgrade

Natura Impact Statement

February 2024

EirGrid

CP966

Natura Impact Statement DRAFT

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Project Manager:	Stephanie Moffatt
Author:	Stuart Cossey
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Jacobs Engineering Ireland Limited

Merrion House
Merrion Road
Dublin 4, D04 R2C5
Ireland
T +353 1 269 5666
F +353 1 269 5497
www.jacobs.com

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Contents

Glossary of Terminology, Abbreviations and Acronyms

Term, Abbreviation or Acronym	Description
AA	Appropriate Assessment
AESI	Adverse Effects On Site Integrity
AIS	Air Insulated Switchgear
B	Breeding
CEMP	Construction Environmental Management Plans
CIEEM	Chartered Institute Of Ecology And Environmental Management
CO	Conservation Objectives
CP1021	Capital Project 1021
cSAC	Candidate Special Area Of Conservation
DHLGH	Department Of Housing, Local Government And Heritage
DoEHLG	Department Of Environment, Heritage And Local Government
EC	European Commission
EEA	European Environment Agency
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
GIS	Gas Insulated Switchgear
HDD	Horizontal Directional Drilling
HVAC	High-Voltage Alternating Current
IFI	Inland Fisheries Ireland
IROPI	Imperative Reasons Of Overriding Public Interest
LSE	Likely Significant Effects
MIFI	Member Of The Institute Of Fisheries Management
MRSB	Member Of The Royal Society Of Biology
NBDC	National Biodiversity Data Centre
NIS	Natura Impact Statement
NPAD	National Planning Application Database
NPWS	National Parks And Wildlife Service
NRA	National Roads Authority
OPR	Office Of The Public Regulator
pSPA	Potential Special Protection Area
QI	Qualifying Interest
SAC	Special Areas Of Conservation
SPA	Special Protection Areas
TII	Transport Infrastructure Ireland
UGC	Underground Cable
W	Wintering
WFD	Water Framework Directive

Executive Summary

An appropriate assessment screening report was produced for the Kildare to Meath Grid Upgrade proposed cable installation 'the Proposed Development' (Jacobs 2024a) which concluded that due to the hydrological linkage between the Proposed Development and the Rye Water Valley/Carton SAC it was not possible to exclude that the Proposed Development alone and in-combination with three other plans and ten projects would have a likely significant effect on this European site and a Natura Impact Statement (NIS) has been prepared to inform an Appropriate Assessment by the competent authority.

Using the source-pathway-receptor model, the River Boyne and River Blackwater SAC was considered to be in the Zone of Influence (ZoI) of the Proposed Development due to a potential effects pathway for otter (*Lutra lutra*) but as Likely Significant Effects (LSE) could be excluded the site screened out of the assessment. The following 14 European sites were considered to be outside the ZoI due to one or more of the following reasons, lack of hydrological connectivity, weak hydrological link due to dilution effects, absence of Qualifying Interest (QI) or supporting habitat, and therefore not included in the assessment:

- River Boyne and River Blackwater SPA;
- Ballynafagh Bog SAC;
- Ballynafagh Lake SAC;
- Mouds Bog SAC;
- Pollardstown Fen SAC;
- North Dublin Bay SAC;
- South Dublin Bay SAC;
- Howth Head SAC;
- Rockabill to Dalkey Island SAC;
- Poulaphouca Reservoir SPA;
- South Dublin Bay and River Tolka Estuary SPA;
- North Bull Island SPA;
- North-West Irish Sea SPA; and
- Howth Head Coast SPA.

In this NIS, it was established that due to hydrological connections there was potential for impacts to the Rye Water Valley/Carton SAC in the absence of mitigation. The qualifying interest features of Rye Water Valley/Carton SAC are petrifying springs with tufa formation and the species narrow-mouthed whorl snail (*Vertigo angustior*) and Desmoulin's whorl snail (*Vertigo moulinsiana).* Consideration was given to the potential for a pollution event to undermine the conservation object of the qualifying interest features. In the absence of appropriate mitigation, three out of nine attributes of the conservation objectives of the petrifying springs, three out of four attributes of narrow-mouthed whorl snail and four out of six attributes of Desmoulin's whorl snail were considered to have the potential to be undermined by a hydrologically linked pollution event. Mitigation measures are provided to ensure that there will not be a water pollution incident at any of the watercourses crossed by or in proximity to the Proposed Development, that could result in an adverse effect on the integrity of this European Site .

The result of the in-combination assessment was that in the absence of mitigation there was potential for in-combination effects with three plans and eleven projects due to the potential for pollution effects during construction. Meath County Development Plan, Kildare County Development Plan and EirGrid Grid Implementation Plan. For projects in the absence of mitigation there is potential for in-combination effects from: 201143, 20840/310016, 314232, 22314564, 23794, 212217, 2360216, 191288, 191296, 21365, MCC R156 Jenkinstown Road Improvement Scheme, NTA Leinster Orbital Route, NTA Emergency Diversion Route (M50) and Microsoft Jigginstown Data Centre. With mitigation, either from the plans or the projects, or from the Proposed Development, there is no potential for a significant in-combination effect from pollution event(s) to undermine the integrity of any European site.

1. Introduction

1.1 Background

This Natura Impact Statement (NIS) is for the Kildare Meath Grid Upgrade Project, Capital Project 0966 (CP0966) (the "Proposed Development"). The Proposed Development for which approval is being sought is called CP966 Kildare-Meath Grid Upgrade and includes 52.9 km of new 400 kV underground cable between the existing Woodland substation in the townland of Woodland, near Batterstown, County Meath and the existing Dunstown substation in the townland of Dunnstown, near Two Mile House, County Kildare, as well as upgrades to both substations.

There is 37.8 km of the proposed underground cable located in County Kildare and 15.1 km of the proposed underground cable is located in County Meath. Eighty-two percent of the underground cable will be located within public roads and 18% will be located in private lands, to avoid location-specific constraints.

The Proposed Development (see Figure 1.1) will assist in the transfer of primarily renewable electricity from the south and southwest region of Ireland to the east region, and its subsequent distribution within the network in Meath, Kildare and Dublin. A significant number of Ireland's electricity generators are in the south and southwest regions, where many wind farms and some modern electricity generators are located. The power that is generated in these regions needs to be transported to where it is needed – known as demand centres. The power is mainly transported cross-country on the two existing 400 kV lines from Moneypoint station in County Clare to Dunstown substation in County Kildare and Woodland substation in County Meath. The Proposed Development will connect these two nodes, and this will thereby strengthen the transmission network by improving reliability and security in the east region.

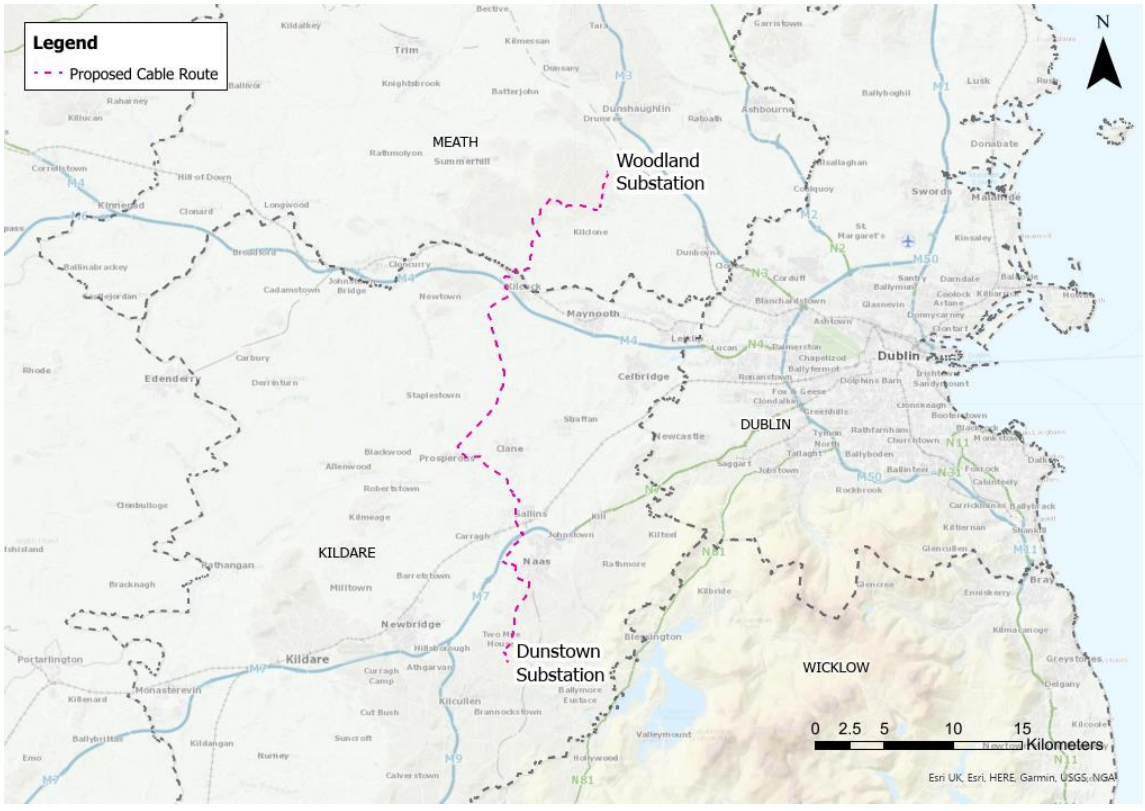

Figure 1.1 Proposed cable route

The Proposed Development is essential to meet the Government of Ireland's Climate Action Plan target of up to 80% renewable energy by 2030. The Proposed Development will also help meet the growing demand for electricity in the east region.

There are two drivers that underpin the need for this Proposed Development, namely:

1. Increased demand on East coast – An increase in electricity demand as part of natural growth is expected. In addition, there is a demand increase in the order of 1200 MW due to the planned connection of high energy users. This is based on executed and offered connection agreements mostly in the counties Kildare, Meath and Dublin. Part of this demand started to connect to the system in 2017 and is ramping up to the total demand figure in 2030. The interest is high, and it is expected that this trend will continue with further requests for connection.

2. Integration of generation from the South and South West regions – Significant levels of new renewable generation have connected or are in the process of connecting to the transmission and distribution system in the south and southwest of Ireland. This is also where the newer and more cost effective existing conventional generation units are located. This results in a scenario whereby a significant portion of the generation sources are located in the south and southwest of Ireland away from the main demand centres within the Dublin and Greater Dublin Area, and East region in general. The power produced will hence have to be transported to get to where it is needed (known as demand centres).

These two drivers introduce cross country power flows on the existing transmission system from the West to the East coast. The Proposed Development is needed to ensure compliance with EirGrid's Transmission System Security Planning Standards (TSSPS). To ensure transmission system reliability and security, the performance of the network is compared with the requirements of the Transmission System Security and Planning Standards which are available at www.eirgridgroup.com.

The violations occur for the unplanned loss of any of the existing 400 kV circuits between Moneypoint 400 kV station in the West and Dunstown 400 kV in County Kildare and Woodland 400 kV station in County Meath in the East. The violations relate to two aspects:

- Bringing required power to the East coast; and
- Transferring this power within Counties Dublin, Kildare and Meath once the power reaches the East coast.

The power is currently transported cross-country on the two existing 400 kV lines from the Moneypoint station in County Clare to the Dunstown substation in County Kildare and Woodland substation in County Meath. Transporting large amounts of electricity on these 400 kV lines could cause problems that would affect the security of electricity supply throughout Ireland, particularly if one of the lines is lost unexpectedly. To solve this emerging issue, EirGrid needs to strengthen the electricity network between Dunstown and Woodland to avoid capacity and voltage problems. The Proposed Development will help transfer electricity to the east of the country and distribute it within the network in Meath, Kildare and Dublin, helping to ensure compliance and resolve the emerging issues identified above.

In summary, the Proposed Development involves improvements to the transfer of electricity to the east of Ireland and its distribution within the network in Meath, Kildare, and Dublin. The will help meet the growing demand for electricity in the east which is due to an increase in economic activity and the planned construction of a number of data centres and other industrial users in the area. CP0966 aims to strengthen the transmission network between Dunstown 400 kV substation in Kildare and Woodland 400 kV substation in Meath. The Proposed Development' (see Section 1.2of this report for further details) which will see the installation of a 400 kV underground cable (UGC) between Dunstown substation in the south and Woodland substation in the north, including substations upgrades, whose route alignment is shown in Image 1.1. The cable route, the watercourses and the European sites closest to it are shown in Figure 1.1 (321084AH-JAC-ZZ-XX-DR-K-3036), Appendix A.

EirGrid appointed Jacobs Engineering Consultants for the Proposed Development. Jacobs's ecologists produced a Screening Report for Appropriate Assessment (AA) of the Proposed Development. The conclusion of the Screening for Appropriate Assessment is that in the absence of mitigation measures it cannot be excluded, on the basis of objective scientific evidence, that the Proposed Development, individually or in-combination with other plans or projects, will have a significant effect on the Rye Water Valley/ Carton SAC. Therefore, progression to AA was required to assess the potential for adverse effects on the integrity of the European site identified at screening. The scientific assessment in support of the AA is documented within this NIS which contains the information

required for the competent authority (in this instance An Bord Pleanála to undertake an AA in respect of the Proposed Development.

1.2 Description of the Proposed Development

1.2.1 Description of the Proposed Development

The Proposed Development consists of the following principal elements:

A. Installation of an underground cable (UGC), approximately 53 km in length, connecting Woodland 400 kV Substation in the townland of Woodland in County Meath and Dunstown 400 kV Substation in the townland of Dunnstown in County Kildare. The development of the UGC will incorporate the following:

- Construction of a trench of approximately 1.5 m in width and approximately 1.3 m in depth in the public road (approximately 43.5 km) and approximately 1.7 m in depth in private lands (approximately 9.5 km) in which the UGC is laid;
- Construction of joint bays, each approximately 10 m in length and 2.5 m in width – with adjacent communication chambers and link boxes along the alignment of the UGC (on average every 750 m). Where the joint bays are located off-road, permanent hardstanding areas will be created approximately 3 m around the joint bays;
- The laying of communication links and fibre optic cables between both substations, running in the same trench as the UGC;
- The laying of twelve no. permanent access tracks (approximately 4 m in width, approximately 4.5 km in length) over private lands to access the off-road joint bays (and adjacent communication chambers and link boxes);
- The provision of six no. temporary construction compounds (approximately 5.7 ha total) and two no. construction laydown areas along the alignment of the cable route;
- The provision of temporary construction passing bays at 33 joint bay locations, each approximately 100m in length and 5.5 m in width;
- The laying of 11 no. temporary construction tracks (approximately 9.5 km in total length);
- All associated water, rail, road and utility crossings using either trenchless drilling or open cut techniques; and
- All associated and ancillary above and below ground site development works, including works comprising or relating to permanent and temporary construction, roadworks, utility diversions and site and vegetation clearance.

B. Installation of additional electrical equipment and apparatus at the Woodland Substation in the townland of Woodland in County Meath. which is similar to the existing infrastructure and will be installed in a substation compound extension (Meath County Council Reference: 22/1550). This will include:

- Installation of a 400 kV feeder bay and associated electrical shunt reactor (approximately 8 m in height);
- Insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors (approximately 12.6 m in height) in order to connect the bay to the busbar;
- All ancillary site development works including site preparation works, temporary compound, underground cabling, and earthgrid, as required to facilitate the development.

C. Installation of additional electrical equipment and apparatus at the Dunstown Substation in the townland of Dunnstown in County Kildare which are similar to the existing infrastructure and does not require the extension of the substation compound. This will include:

- Installation of a 400 kV feeder bay and associated electrical shunt reactor (approximately 9 m in height);
- an extension to the 400 kV busbar in order to connect the 400 kV cable feeder bay to the existing 400 kV busbar;

- Ten no. lightning masts (approximately 41 m high);
- Insulators, instrument transformers, current transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors (approximately 12.7 m in height) in order to connect the bay to the busbar; and
- An ancillary site development works including site preparation works, temporary compound, underground cabling and earthgrid, surface water drainage, and lighting poles as required to facilitate the development.

It is anticipated that the construction phase for the Proposed Development will last up to 42 months (excluding vegetation clearance). The construction activities will be phased. The basic elements of the construction phase are:

- **Enabling works:** These are works to allow the construction phase to progress, including site investigations and other survey activities, vegetation clearance, construction of access tracks and the temporary construction areas (e.g. compound areas and haul roads on off-road sections);
- **Phase 1: Installation of passing bays and joint bay structures:** The construction of passing bays (where required) at joint bay locations. On completion of the passing bays, it is proposed that the joint bays will be installed at the same time;
- **Phase 2: Excavation and installation of ducts:** A trench will be dug along the cable route, ducts installed, and the road surfacing or agricultural land will be restored. This will also include physical crossings such as motorways, rivers and railways;
- **Phase 3: Installation of cables:** The cables will be installed at joint bay locations within the ducts. The cables will then be jointed (connected) at each joint bay location to allow the installation of a continuous circuit. The circuits will then be tested to ensure they are ready to be commissioned for use;
- **Substation works**: Construction works are required in the existing Woodland and Dunstown substations to connect the underground cable to the existing electrical grid; and
- **Decommissioning**: At this stage, the project will decommission the temporary construction compounds and passing bays and complete any agreed landscaping works.

The proposed underground cable and substation equipment is highly specialised and is generally custom manufactured for such projects. The design of the Proposed Development is based on the current understanding of such equipment and also proposed construction techniques, statutory requirements, consultations with affected landowners, ground conditions, and environmental constraints.

In line with all large infrastructure projects, there will be a period of detailed design after planning consent and when the contractor is appointed. The contractor will confirm the detailed design of the development following on-site detailed, confirmatory surveys, albeit within the scope, nature and location of the approved development (should this proposed development be approved by the consenting authority). Further details of the Proposed Development and proposed construction activities are provided below..

The routing of the cable and associated jointing and passing bays took into consideration the location of mature trees along the route. The route and bay positions were moved to avoid mature trees where possible. However, due to narrow treelined roads in several locations and the requirement for set distances between jointing bays, avoidance of vegetation loss was not possible in all areas and to accommodate the trenches for the UGC there will be significant removal of hedgerows, trees, including mature trees, which are lining the road network where the Proposed Development is located.

Six temporary construction compounds are proposed, each approximately one hectare in size. All temporary construction compounds will be secured with hoarding/ fencing around their perimeter as appropriate. Temporary construction compounds will include facilities such as construction phase car parking and welfare facilities and temporary material storage areas as necessary.

The temporary construction compounds are all located with the planning application boundary and are as follows:

- Compound No. 1: Chainage 3250, off the R156 – approximately 0.8 ha;
- Compound No. 2: Chainage 11000, off the R156 – approximately 0.7 ha;
- Compound No. 3: Chainage 21000, off the R407 – approximately 0.9 ha;
- Compound No. 4: Chainage 31000, off the R408 – approximately 1.5 ha;
- Compound No. 5: Chainage 35750, off the L2002 – approximately 1.1 ha; and
- Compound No. 6: Chainage 52000, off the R448 – approximately 0.7 ha.

Both temporary and permanent tracks are proposed. Where a permanent access track is required to access off-road joint bays, this will comprise of 300mm of fill material and finished to 100mm above ground level and will be 4 m wide. The access track will remain in place to allow access to cables should future maintenance works be required. The permanent access track will be designed and constructed to accommodate heavy plant (5t axel loading) movement. There will be twelve permanent access tracks which will maintained by ESB. These tracks will be used infrequently for operational maintenance by ESB. Where an access track crosses an existing field boundary, a gate will be provided to maintain the boundary. Where an access track crosses from one landowner to another, access will be for ESB only and measures will be put into place to ensure livestock do not escape during ESB access (e.g., double gates). The permanent access tracks are provided to the following joint bays: JB1-4 (one access track for all four joint bays); JB8; JB10; JB15, JB21, JB31, JB42, JB49, JB50, JB54, JB60, and JB70. Where a temporary access track is required, engineering stone fill will be laid and compacted and maintained as required for the duration of the works. Once the works are completed, the engineered stone fill will be removed, and the land will be reinstated to its original condition.

Horizonal directional drilling (HDD) is proposed at major watercourse crossings or where there are significant constraints. Launch and reception pits of approximately 3 m x 5 m will be constructed for the HDD holes and will be constructed within the Planning Application Boundary. HDD is proposed at six locations, with a compound for launch and a compound for receptor, along the cable route including at Rye Water (WB13) which is approximately 6 km direct distance over land and approximately 8 km hydrologically, at the closest point to the Planning Application Boundary. The HDD temporary construction compound will comprise welfare facilities, car parking, security lighting, launch or receptor pit, areas for material laydown, material storage, waste storage and HDD ducting storage (see Image 6). The site will have gravel hardstanding and security fencing.

- HDD Compound Location No. 1: Chainage Centre Point 15100, Rye Water – approximately 0.9 ha and 0.08 ha;
- HDD Compound Location No. 2: Chainage Centre Point 15500, Royal Canal and railway– approximately 0.019 ha and 0.17 ha;
- HDD Compound Location No. 3: Chainage 1 Centre Point 6700, M4 – approximately 0.38 ha and 0.40 ha;
- HDD Compound Location No. 4: Chainage Centre Point 22000, Tributary of Liffey_010– approximately 0.08 ha and 0.14 ha;
- HDD Compound Location No. 5: Chainage Centre Point 37350, River Liffey – approximately 0.11 ha and 0.12 ha; and
- HDD Compound Location No. 6: Chainage Centre Point 44600, Grand Canal – approximately 0.12 ha and 0.39 ha.

1.2.2 Programme and Timing of Works

Subject to the grant of statutory approvals, it is anticipated that the construction phase will commence in Quarter 2, 2025 with the underground cable element of the Proposed Development becoming fully operational after construction and testing in Quarter 3, 2028.

The works at the Woodland Substation are expected to last approximately 24 months while the works at Dunstown Substation are expected to last approximately 12 months and will run concurrently with the cabling works.

Construction activities will gradually phase out from pre-construction to predominantly civil activities followed by commissioning and testing.

It is anticipated that construction will occur during normal working hours i.e. Monday to Friday 7 am to 7 pm and Saturday from 7 am to 2 pm. There may be localised instances where night-time working is required to facilitate traffic management, however, should working outside these hours / days be required they will only be undertaken with prior agreement with Meath and Kildare County Councils.

Clearance of hedgerow, treeline or scrub vegetation, where required, will take place after 31 August and before 1 March in order to protect breeding birds, (i.e. outside of the bird breeding season). Clearance may take place during the restricted period, if a suitably qualified ecologist has determined that nesting birds and other protected species are absent.

Any element of the Proposed Development requiring instream works in watercourses with fisheries value will be restricted to the fisheries open season (i.e. will only take place during the period July to September), unless with the agreement of IFI.

Table 1.1 Indicative Preliminary Construction Programme

Description	Estimated Construction Programme (Months)	2025				2026				2027				2028			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposed Development - Construction Duration																	
Overall Construction Duration	42																
Enabling Works	9 *																
Phase 1: Installation of joint bay and passing bay structures	36																
Phase 2: Excavation and installation of cable ducts	24																
Phase 3: Installation and jointing of cables	24																
Substation works	24																
Testing and commissioning	9																
Energisation and permanent works construction complete	3																

*Enabling works will be undertaken as required during this period. Habitat clearance will be completed outside of the bird nesting season.

The main contract works will be adapted to take account of planning and compliance requirements.

Indicative durations for the proposed works are detailed in Table 1.1. Subject to the grant of consents, it is anticipated that installation of the underground cable will take approximately 42 months in total. Safety requirements for the installation operations / procedures, detailed design considerations and weather condition will however ultimately dictate the final programme.

The majority of the construction activities are not dependent on outages on the existing transmission system, however, specific activities associated with the connection at the existing Woodland and Dunstown substations on to the existing transmission infrastructure will be planned and programmed into EirGrid's multi-year outage programme. This is because the existing live infrastructure needs to be switched off during such connection activities. EirGrid, as Transmission System Operator, will develop a detailed plan for such outages each year to ensure the undertaking of the safe and efficient construction and maintenance activities involving or in proximity to existing infrastructure.

1.2.3 Underground Cable

1.2.3.1 Overview

There are three key elements of the underground cable construction:

- Cable Trench - an approximately 1.5m in width, 1.3m in depth in the public road and 1.8m in depth in private lands in which the underground cable is laid (see Figure .1.2);
- Joint Bay - the cable will be delivered in lengths and will need to be connected (jointed) together. This will happen at the Joint Bays which are underground chambers located at various points on the route. Joint Bays are used as locations to pull the cables into the pre-installed ducts and to connect ('joint') together the individual cables and create a single, overall continuous circuit; and
- Passing Bay – a temporary traffic lane to allow traffic flow around Joint Bays while construction works are ongoing.

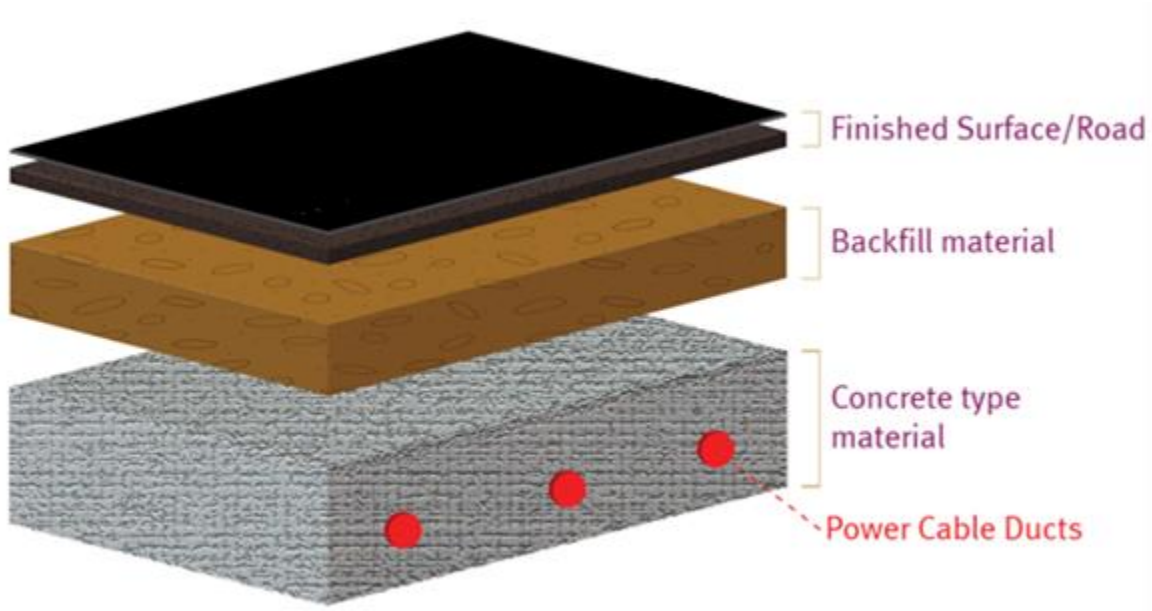

Figure 1.2: Proposed High-Voltage Alternating Current (HVAC) Cable Duct Arrangement (single conductor per phase solution)

The width and depth of the cable trench can vary for crossing of watercourses or utilities and for other technical reasons.

The cable will be delivered to site in individual lengths on cable drums. These lengths will be installed along the route by using 'Joint Bays'.

Smaller buried chambers ('manholes') will be installed alongside various Joint Bay locations. There are two types:

- C2 chambers, which are used to join the fibre optic communication cables pulled into the pre-installed communications ducts; and
- Link box chambers, which are used to accommodate the link box (a device which earths the outer sheaths of the power cables).

As with any telecommunications facilities, these chambers will be provided with removable covers to facilitate access for ongoing maintenance and commissioning works. While the Joint Bays will not require ongoing maintenance, access from the surface is still required in the unlikely event of a cable failure needing replacement.

A proposed Joint Bay under construction is shown in Image 1. An image of a reinstated road after Joint Bay construction is shown in Image 2. Passing Bays will be required where Joint Bays will be in the road carriageways, except where there is sufficient road width (see Table 1.2). There will be 70 Joint Bays along the public road / verge in off road sections. Table 1.2 show locations of both Joint and Passing Bays and a proposed Passing Bay is shown in Image 3.

Image 1: Proposed Arrangement for a Joint Bay in Public Roadway.

Image 2: Proposed Reinstated Road over a Joint Bay (Darker Tarmac) with the C2 Chamber cover visible

Image 3: Proposed Arrangement for a Passing Bay Installation.

EirGrid has carefully considered the previous investments made by Meath and Kildare County Councils in maintaining and upgrading their road surfaces. EirGrid will establish key principles and agree appropriate methodologies with the County Councils for road reinstatement, where cable and associated infrastructure has been constructed. This could include reinstatement of road surfacing wider than the underground cable trench and Joint Bays subject to planning approval by the planning authorities. This will be in accordance with the accepted standard for underground cable development; The Guidelines for Managing Openings in Public Roads (hereafter referred to as The Purple Book) (Department of Transport, Tourism and Sport 2017). This can also be assured by way of an appropriate Condition of planning approval.

As identified in Section 1.2.1, the specific location (as shown in Table 1.2) and design of Joint Bays and Passing Bays are subject to refinement at the detailed design stage.

1.2.4 Substations

1.2.4.1 Woodland Substation

The Proposed Development at Woodland Substation will consist of the provision of new electricity transmission infrastructure, comprising of the following (refer to Figure 4.1 (Sheet 2) in Volume 4 of the EIAR for a graphic of the proposed works at Woodland Substation):

- Additional electrical equipment and apparatus which is similar to the existing infrastructure and will be installed in a substation compound extension (Meath County Council Reference: 22/150 221550). This will include:
    - Installation of a 400kV feeder bay and associated electrical shunt reactor);

- Insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors in order to connect the bay to the busbar; and

- All ancillary site development works including site preparation works, temporary compound, underground cabling, and earthgrid, as required to facilitate the development.

1.2.4.1.1 Woodland Substation Construction Phase Activities

The works at Woodland Substation will be undertaken in parallel with the cable works ongoing between Woodland and Belcamp Substations. Construction access for the works at Woodland Substation will be via the existing substation access road, Redbog Road, off Red Road. A Temporary Construction Compound will be set up in the south-east corner of the substation and will provide site office and welfare facilities as well as material and plant storage for the substation works. There will be no access to the cable route easement from these compounds. The area for the new works in the substation will be cleared and shallow founded reinforced concrete bases installed for the new Air Insulated Switchgear (AIS) plant, as well as a Reinforced Concrete (RC) bund for the reactor. The AIS plant will be installed on the RC base slabs and associated connections installed. The reactor will be delivered to site as an abnormal load with the appropriate measures to minimise impact to local traffic (refer to Appendix B (Construction Traffic Management Plan) of the Construction Environmental Management Plan (CEMP), which are included as standalone documents in the planning application pack). The reactor will be slid into place on its bund off the delivery trailer. A mobile crane will be used to lift into place the new AIS plant. The new 400kV cable will be trenched across the substation from the south-west corner to connect to the new cable sealing end. Once the 400kV cable has been installed and the works at Belcamp and Woodland Substations have been completed, the whole system will be tested and commissioned.

1.2.4.2 Belcamp Substation

- Construction of a new 400kV Gas Insulated Switchgear (GIS) eight bay building (73 m long, 17.8 m wide, 16.0 m in height (1,745 sqm)) within the recently consented extended substation compound. A GIS substation building is where gas (Sulphur Hexafluoride – SF6) is used as the insulation between circuits. This requires the electrical equipment to be contained internally in buildings above ground.

- Installation of 1 no 400/220kV Power Transformer east of the new GIS building, including connections to the new GIS building;

- Installation of a 400kV feeder bay and associated electrical shunt reactor (approximately 8 m in height);

- Insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors (from 7.9 m to 12.8 m in height) in order to connect the bay to the GIS building; and

- All ancillary site development works including site preparation works, site clearance, hardstanding, internal access tracks and a temporary construction compound, underground cabling and earthgrid, surface water drainage connections to the substation network, foul water drainage connection to the substation foul system and lightning protection (8 x 3m air rods on the top of the 400kV GIS building)

1.2.4.2.1 Belcamp Substation Construction Phase Activities

The works at Belcamp Substation will be undertaken in parallel with the cable construction works. A Temporary Construction Compound (TCC6) will be set up to the west of the substation accessed along a temporary access track off Stockhole Lane to the west. Construction materials will be delivered to site via the existing substation main entrance off the R139 Regional Road.

The area for the new works at Belcamp will be prepared to install the new in-situ reinforced concrete bases for the GIS building, transformers and other miscellaneous AIS plant. The steel frame of the GIS building will be erected and then the roof and wall cladding added to make weather tight. A mobile crane will be used for the erection of the steel frame and cladding. The GIS equipment will be craned into place inside the building using the gantry

crane within the building, and then the GIS building will be fitted out with all associated protection and control equipment, Low Voltage Alternating Current (LVAC) equipment etc. At the same time, the external AIS equipment will be installed and associated connections installed. The reactor and transformers will be delivered to site as abnormal loads with all the relevant traffic management requirements / restrictions in place for such abnormal loads (refer to Appendix B (Construction Traffic Management Plan) of the Construction Environmental Management Plan (CEMP), which are included as standalone documents in the planning application pack). These will be slid into place directly from their transport trailer onto their RC bunds. The new 400kv cable will be trenched into the substation and under the RC perimeter wall to connect up to the AIS cable sealing end outside the GIS building. Once the new 400kV cable has been installed and tested, and the works at Woodland Substation completed, the whole system will be connected together, tested and then commissioned.

1.2.5 Cable Construction Phase Activities

The following sections describe the proposed Construction Phase activities associated with the installation of the new underground cable. The laying of the new underground cables is a standard construction technique undertaken by a range of utility and other services providers. Underground cables will be installed in a flat formation in the following phases:

- Phase 1 – Installation of Joint Bays and Passing Bay structures;
- Phase 2 – Excavation and installation of underground cables; and
- Phase 3 – Installation and jointing of cables.

Duct and Joint Bay installation are the most construction-intensive and invasive elements of cable route installation as digging of a trench is required. For in-road cable laying, this phase will have the largest potential impact on traffic, including the potential need for rolling road closures (to through traffic) and diversions.

While the specifics of any cable-laying schedule are dependent upon the appointed contractor and the nature and location of the development. It is proposed that cable ducts will be laid in a road at a rate of 40m to 50m per day, although a reduced rate of 10 m to 20 m per day is anticipated in constrained sections of the route for example where existing utilities are present.

Joint Bays are proposed to be located at average intervals of 750 m along the cable route of the Proposed Development. However, shorter intervals are proposed to occur where the route alignment is more complex. Joint Bays are anticipated to be installed in three days. Road reinstatement along the route of the cable trench will follow the completion of the trenching and ducting, moving in sequence along the route.

Cable pulling and jointing, which will commence when the trenching and ducting is well advanced along the route, will be executed from the Joint Bay locations. Where this activity is likely to require a road closure, the provision of a Passing Bay at the location of the Joint Bay, where possible, will facilitate movement of traffic along the road by means of a signal-controlled lane adjacent to the Joint Bay.

Image 4 shows a proposed cable trench in a public road after installation of ducts and prior to backfilling. Marker boards can be seen within the trench prior to final reinstatement. Image 5 presents a reinstated road following laying of the underground cable circuit.

Image 4: Example of a Proposed Cable Trench In-Road with Cables in Flat Formation.

Image 5: Example of a Proposed Reinstated Road Following the Laying of Underground Cables

1.2.5.1 Joint and Passing Bays

Every 500m to 800 m (approximately 750 m where possible) joint bays will be installed (buried in the ground) which are approximately 2.5 m wide, 2.6 m deep and 10 m long. Sand or lean mix concrete will be used as a foundation layer to the underside of the chamber. The ducts will be installed to each end of the chamber, then checked, cleaned and sealed.

The open concrete chamber will temporarily support the retained ground on the outside of the chamber during the ducting activities. Once these activities are completed, the open chamber will be temporarily backfilled with appropriate material and the road temporarily reinstated until cable installation. During cable installation, the joint bay will be reopened and material within the chamber removed and replaced following completion of the cable

installation. Joint bays located off-road will require permanent access tracks for maintenance purposes, the precise design and location of which will be determined in consultation with landowners during later steps in the development of the Proposed Development.

Table 1.2: Proposed Joint Bay and Passing Bay Locations

Joint Bay	Approximate Chainage	Approximate Distance from previous Joint Bay	Location	Passing Bay required?	Side of road Passing Bay is located	Hard Standing Area
JB 01	706	N/A	Off-road	N/A	N/A	Yes
JB 02	1494	788	Off-road	N/A	N/A	Yes
JB 03	2241	747	Off-road	N/A	N/A	Yes
JB 04	2978	737	Off-road	N/A	N/A	Yes
JB 05	3750	772	In-road	Y	North	No
JB 06	4521	771	In-road	Y	South	No
JB 07	5190	669	In-road	Y	North	No
JB 08	5919	729	Off-road	N/A	N/A	Yes
JB 09	6629	710	In-road	Y	South	No
JB 10	7283	654	Off-road	N/A	N/A	Yes
JB 11	8028	745	In-road	Y	North	No
JB 12	8585	557	Off-road	N/A	N/A	Yes
JB 13	9144	559	In-road	Y	South	No
JB 14	9914	770	In-road	Y	East	No
JB 15	10730	816	Off-road	N/A	N/A	Yes
JB 16	11457	727	In-road	Y	East	No
JB 17	12294	837	In-road	Y	East	No
JB 18	13036	742	In-road	Y	East	No
JB 19	13893	857	Off-road	N/A	N/A	Yes
JB 20	14758	865	Off-road	N/A	N/A	Yes
JB 21	15390	632	Off-road	N/A	N/A	Yes
JB 22	16144	754	Off-road	N/A	N/A	Yes
JB 23	16885	741	Off-road	N/A	N/A	Yes
JB 24	17546	661	Off-road	N/A	N/A	Yes
JB 25	18296	750	In-road	Y	South	No
JB 26	19172	876	In-road	Y	East	No
JB 27	20010	838	In-road	Y	East	No
JB 28	20759	749	In-road	Y	East	No
JB 29	21507	748	In-road	Y	East	No
JB 30	22288	781	Off-road	N/A	N/A	Yes
JB 31	23010	722	Off-road	N/A	N/A	Yes
JB 32	23770	760	In-road	Y	West	No
JB 33	24439	669	In-road	Y	East	No
JB 34	25269	830	Off-road	N/A	N/A	Yes
JB 35	25950	681	In-road	Y	East	No
JB 36	26640	690	Off-road	N/A	N/A	Yes

Joint Bay	Approximate Chainage	Approximate Distance from previous Joint Bay	Location	Passing Bay required?	Side of road Passing Bay is located	Hard Standing Area
JB 37	27380	740	In-road	Y	North	No
JB 38	28196	816	In-road	Y	North	No
JB 39	29029	833	In-road	Y	North	No
JB 40	29824	795	In-road	Y	South	No
JB 41	30656	832	In-road	Y	South	No
JB 42	31365	709	Off-road	N/A	N/A	Yes
JB 43	32062	697	In-road	Y	South	No
JB 44	32943	881	Off-road	N/A	N/A	Yes
JB 45	33656	713	In-road	Y	West	No
JB 46	34466	810	In-road	Y	North and South*	No
JB 47	35221	755	In-road	Y	North	No
JB 48	35998	777	In-road	Y	East	No
JB 49	36814	816	Off-road	N/A	N/A	Yes
JB 50	37431	617	Off-road	N/A	N/A	Yes
JB 51	38250	819	Off-road	N/A	N/A	No
JB 52	38920	670	Off-road	N/A	N/A	No
JB 53	39675	755	Off-road	N/A	N/A	No
JB 54	40378	703	Off-road	N/A	N/A	Yes
JB 55	41165	787	In-road	N	Not required due to road width	No
JB 56	41800	635	In-road	N	Not required due to road width	No
JB 57	42744	944	In-road	N	Not required due to road width	No
JB 58	43433	689	Off-road	N/A	N/A	No
JB 59	44073	640	Off-road	N/A	N/A	No
JB 60	44884	811	Off-road	N/A	N/A	Yes
JB 61	45373	489	In-road	N	Not required due to road width	No
JB 62	46109	736	In-road	N	Not required due to road width	No
JB 63	46876	767	In-road	Y	East	No
JB 64	47635	759	In-road	Y	West	No
JB 65	48392	757	In-road	Y	East	No
JB 66	49148	756	In-road	Y	West	No
JB 67	49915	767	In-road	Y	West	No
JB 68	50689	774	In-road	Y	East	No
JB 69	51366	677	Off-road	N/A	N/A	Yes
JB 70	52116	750	Off-road	N/A	N/A	Yes

*A passing bay is currently on both sides of the road at Joint Bay 46. At detailed design stage, one location will be selected, and the other passing bay location will not be utilised.

In some locations, where joint bays are installed in the road, passing bays may be required to facilitate future maintenance without the requirement for traffic management measures. This is most likely to occur on very narrow roads but may be required elsewhere, for example on very busy road corridors or where installations are close to significant road junctions such as at motorways. These passing bays are proposed to be between 60 and 120 m long within the parameters of the proposals set out in the planning application.

The installation of the passing bay requires removing and temporarily storing the ground top layers off-road, to the side of the carriageway. This material will be used to allow reinstatement later. The passing bays will then be constructed to a standard agreeable to Meath County Council and Kildare County Council. The passing bay will be constructed to be at the level of the existing road surface. This may require the importation of fill material in certain locations. Roadside drains will be maintained and where it is required; culverts and piping will be used to maintain the waterflow under the passing bay. Temporary drainage will be provided to ensure appropriate run-off from the new road surface.

The passing bays will not be in use for the full duration of the construction period. The bays will be used during the joint bay construction and the cable pulling and jointing process. When the bays are not in use, measures will be put in place to ensure no illegal parking.

The reinstatement of the passing bays will occur on the completion of Phase 3 of the construction period. The materials used to construct the bays will be removed from site and taken to a suitably licensed facility. The area will be reinstated and relandscaped to reflect the previous landform at each location.

1.2.5.2 Watercourse crossings

Several watercourse crossings will be required along the cable route (Table 1.3). These crossings will be facilitated by either horizonal directional drilling (HDD) or open cut trenches as appropriate for the particular crossing.

HDD, also known as directional boring, is a minimal impact trenchless method of installing underground utilities, including cables, in a relatively shallow arc along a prescribed underground path using a surface-launched drilling rig. HDD offers environmental advantages over open trench excavations and will be used when conventional trenching is not practical or when minimal surface disturbance is required. Competent specialist contractors will be appointed to undertake the work. There are no above ground works except for the start and end points of the hole (see Image 6).

Image 6: HDD Receiving Pit with 220kV Cable being pulling through trenchless duct (Source LinkedIn - Pat Dunne, Dunnes Drilling Services Ltd).

Where HDD is not being used open cut method is planned, see Table 1.3. Open cut trenching is an area excavated through fields or in road where the cable is constructed. It is proposed to carry out all these works in a dry works area. The dry works area will be isolated by installing an impermeable barrier between the watercourse and the works area. The impermeable barrier will be tailored to the watercourse in question. If required by IFI, in-stream trenching works will not be carried out during extreme rainfall or high flow events. Met Éireann provides a 5-day weather forecast via its website (www.met.ie) and works will not take place during yellow, orange and red weather warnings. Unless otherwise agreed with IFI, any element of the works requiring in-stream trenching works will be restricted to the fisheries open season (i.e., restricted to July to September inclusive). Further details are described in Section 6.1 (mitigation measures).

Table 1.3: Waterbodies and the crossing methodologies.

Waterbody number (WB)	Waterbody name	Chainage	Waterbody location – Grid reference	Proposed Crossing
WB01	Tributary of the Tolka 020	800	N 95028 46797	Instream trenching
WB02	Dunboyne Stream_010	1900	N 94782 46269	Instream trenching
WB03	Rye Water_030	3615	N 93930 45180	Diversion from in-road to off-road, by instream trench.
WB04	Jenkinstown stream_010	6000	N 91730 45313	Diversion from in-road to off-road, by instream trench.
WB05	Pond	7385	N 90677 45988	Instream trenching
WB06	Jenkinstown Stream_010	8080	N 90246 45483	Diversion from in-road to off-road, by instream trench.

Waterbody number (WB)	Waterbody name	Chainage	Waterbody location – Grid reference	Proposed Crossing
WB07	Jenkinstown Stream_010	10700	N 89775 43468	Diversion from in-road to off-road, by instream trench.
WB08	Jenkinstown Stream_010	11180	N 89661 43153	Diversion from in-road to off-road, by instream trench.
WB09	Unassigned stream	11400	N 89419 43023	Diversion from in-road to off-road, by instream trench.
WB10	Rye Water_020 (Brides Stream)	12370	N 89243 42178	Diversion from in-road to off-road, by instream trench.
WB11	Newtownmoyaghy Stream tributary of Rye Water_020	13650	N 89076 40939	Not crossed by cable
WB12	Rye Water_020 (Padistown)	14400	N 88410 40767	Diversion from in-road to off-road, by instream trench.
WB13	Rye Water_010	15050	N 88065 40613	HDD
WB14	Royal Canal	15400	N 87874 40210	HDD
WB15	Lyreen_010	19920	N 86262 37369	Affected by passing bay
WB16	Drainage ditches	20870	N 86442 36490	Not crossed by cable
WB17	Drainage ditches	21250	N 86592 36149	Diversion from in-road to off-road, by instream trench.
WB18	Drainage ditch	21300	N 86589 36154	Diversion from in-road to off-road, by instream trench.
WB19	Lyreen_010 (Baltracey Trib Lyreen)	21650	N 86673 35787	Diversion from in-road to off-road, by instream trench.
WB20	Tributary of Lyreen_010	22000	N 86754 35459	HDD
WB21	Drainage ditches	22300	N 86823 35188	Diversion from in-road to off-road, by instream trench.
WB22	Clonshanbo_010	23620	N 87176 33938	Diversion from in-road to off-road, by instream trench.
WB23	Drainage ditches	24150	N 87298 33417	Not crossed by cable
WB24	Clonshanbo_020	25800	N 86916 31840	Diversion from in-road to off-road, by instream trench.
WB25	Kilmurry_010	27300	N 86272 30537	Diversion from in-road to off-road, by instream trench.
WB26	Tributary of Kilmurray_010	27600	N 86151 30369	Diversion from in-road to off-road, by instream trench.
WB27	Liffey_130	30000	N 84449 28586	Crossed in-road
WB28	Tributary of Liffey_130	30250	N 84283 28429	Diversion from in-road to off-road, by instream trench.
WB29	Liffey_130	30400	N 84425 28283	Crossed in-road
WB30	Tributary of Slate_010	31360	N 84237 27559	Instream trenching
WB31	Liffey_130	31360	N 84807 27542	Not crossed by cable

Waterbody number (WB)	Waterbody name	Chainage	Waterbody location – Grid reference	Proposed Crossing
WB32	Liffey_120	36150	N 87519 25081	Instream trenching
WB33	Drainage ditch	36650	N 87844 24820	Crossed in-road
WB34	Drainage ditch	36900	N 87950 24710	Instream trenching
WB35	Liffey_120	37200	N 88001 24231	HDD
WB36	Liffey_120	37900	N 88281 24006	Crossed by bridge
WB37	Liffey_120	39000	N 88110 23008	Crossed by bridge
WB38	Grand Canal	39400	N 88152 22604	Crossed by bridge
WB39	Liffey_110	41510	N 88249 21068	Crossed in-road
WB40	Liffey_110	42300	N 87711 20395	Crossed in-road
WB41	Liffey_110	42900	N 87394 20021	Crossed in-road
WB42	Grand Canal	44600	N 88288 19245	HDD
WB43	Liffey_100	45330	N 88310 18467	Crossed in-road
WB44	Drainage ditch	49000	N 88077 15749	Diversion from in-road to off-road, by instream trench.
WB45	Dunstown Stream	52700	N 87555 12433	Instream trenching
WB46	Tributary of Liffey_120	37600	N 88017 24231	Not crossed by cable

1.3 Legislative Context

Habitats and species of European importance are given legal protection under the EU Habitats Directive 92/43/EEC (the Habitats Directive) and the EU Birds Directive 2009/147/ES (the Birds Directive). The Directive protects habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as the Natura 2000 network (hereafter referred to as European sites[1]). European sites comprise Special Areas of Conservation (SACs[2]) and Special Protection Areas (SPAs[2]).

The Habitats Directive (92/43/EEC) And the Birds Directive (2009/147/EC) have been transposed have been transposed into Irish law by the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites.

Article 6(3) establishes the requirement for AA:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

1 The term Natura 2000 network was replaced by 'European site' under the EU (Environmental Impact Assessment and Habitats) Regulations 2011 S.I. No. 473 of 2011.

2 Candidate SACs (cSACs) and potential SPAs (pSPAs) are afforded the same protection as SACs SPAs and are therefore assessed in the same manner within this report

Article 6(4) states:

"If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted."

Section 177U(4)(5) of the Planning and Development Act 2000 (as amended) sets out the AA screening test for planning applications, as follows:

"(4) The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is required if it cannot be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.

(5) The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is not required if it can be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site."

1.4 Stages in Appropriate Assessment

The stages of stages of AA are as follows:

- The purpose of the screening stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in-combination with other plans or projects, could have significant effects on a European site in view of the site's conservation objectives. All potential effects between activities associated with the plans or projects and the ecological components of European sites must be considered. This includes potential effects on mobile species, notably birds, mammals, invertebrates and migratory fish. There is no necessity to establish such an effect; it is merely necessary for the competent authority to determine that there may be such an effect. The threshold at this first stage is a very low one and operates as a trigger in order to determine whether a Stage Two AA must be undertaken by the competent authority on the implications of the proposed development for the conservation objectives of a European site. Therefore, where significant effects are likely, uncertain or unknown at screening stage, a second stage AA will be required. Measures intended to avoid or reduce the harmful effects of the proposed development on European sites (i.e. "mitigation measures") cannot be taken into account in the screening stage appraisal. Measures intended to avoid or reduce the harmful effects of the proposed development on European sites (i.e. "mitigation measures") or best practice measures cannot be taken into account in the screening stage appraisal.
- **Stage 2 Appropriate Assessment:** If it cannot be excluded, on the basis of objective information, that the plan or project, individually or in combination with other plans or projects, would have a significant effect on a European site, the plan or project must be taken forward to the next stage of the process and an AA must be carried out. The competent authority must carry out a focused and detailed examination, analysis and evaluation of the effect of the project or plan on the integrity of the European site(s), specifically it must be determined if the project or plan will adversely affect the integrity of a European site(s) either individually or in-combination with other plans and projects in view of the conservation objectives of the site(s). Case law has established that such an Appropriate Assessment, to be lawfully conducted, in summary:
    I. must identify, in the light of the best scientific knowledge in the field, all aspects of the proposed development which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;
    II. must contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps; and

III. may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where the competent authority decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects. If adverse impacts can be satisfactorily avoided or successfully mitigated at this stage, so that no reasonable doubt remains as to the absence of the identified potential effects, then the process is complete. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must proceed to the next stages."

For projects, the AA process is documented within a Natura Impact Statement (NIS).

Following AA, including mitigation proposals, if AESI remain, and the project/plan is to be progressed, an Assessment of Alternative Solutions is required under the provisions of Article 6(4) of the Habitats Directive. This process examines the alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European site. If no suitable alternatives exist, or all alternatives would result in adverse effects on the integrity of a European site, then the project will move on to the next stage, of the process.

Where an Assessment of Alternative Solutions fails to identify any suitable alternatives, then for a project or plan to be progressed demonstrate that it must nevertheless be carried out for imperative reasons of overriding public interest (IROPI) in accordance with Article 6(4) of the Habitats Directive. If in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed, all compensatory measures necessary to ensure the protection of the overall coherence of the European site must be put in place in accordance with Article 6(4) of the Habitats Directive.

1.5 Statement of Authority

This report has been prepared primarily by Duncan Smith and Dr Irene Bottero, checked by Stuart Cossey and reviewed by Dr Susie Coyle.

Duncan Smith is a Principal Ecologist and Chartered Environmentalist. He has a BSc (Hons) in Zoology from the University of Leeds, an MSc in Environmental Technology with Ecological Management from Imperial College, and as MSc in Marine Environmental Protection from Bangor University. He has 24 years professional ecological experience specialising in botanical surveying, habitat management and evaluation for Ecological Impact Assessment and has written multiple reports informing AA. . During his career he has worked in the private, public, and voluntary sectors, including fifteen years in the private sector, seven years for UK Statutory Nature Conservation Bodies in England and Wales and two years in the voluntary sector.

Dr. Irene Bottero is an Ecologist in Jacobs and holds a BSc (Hons) in Natural Science, MSc (Hons) in Evolution of Animal and Human Behavior from University of Studies of Torino (Italy) and a PhD in Botany from Trinity College Dublin. Irene has authored several scientific papers and has worked in consultancy over a three-year period, carrying out multiple surveys for habitats, insects and river monitoring.

Stuart Cossey is a Senior Ecologist and holds a BSc (Hons) in Conservation Biology and Ecology from Exeter University. Stuart has four years of consultancy associated project experience and three years' experience in conservation. Stuart has authored AA Screening Reports, NISs, Ecological Assessment Reports and Building Research Establishment Environmental Assessment Method (BREEAM). Stuart has a strong background in ornithology and is well practiced in a range of survey techniques.

Dr Susie Coyle is a Senior Associate Director of Ecology and holds a BSc (Hons) in Aquatic Bioscience and a PhD in fish biodiversity from the University of Glasgow. She is a Chartered full Member of the Royal Society of Biology (MRSB), a full Member of Chartered Institute of Ecology and Environmental Management (CIEEM) and a Member of the Institute of Fisheries Management (MIFI). Susie has coordinated Jacobs' ecologists both in Ireland and in the UK and has experience of multiple ecological survey techniques and associate reporting. She has 16 years of consultancy experience in aquatic and terrestrial ecology with over 20 years' experience of field surveys and environmental sampling techniques. One of Susie's main roles is the check and review of reports including Appropriate Assessment Screening reports and Natura Impact Statements.

1.6 Purpose and structure of this report

This report provides information to support the relevant competent authority in undertaking Appropriate Assessment of the Proposed Development.

The structure of the report is as follows:

Section 1: Introduction including description of the Proposed Development, legislative context and the statement of authority.

Section 2: Overview of the AA methodology including the guidance and consultation used in compiling this report.

Section 3: Description of the baseline environment

Section 4: Summary and conclusion of Screening for Appropriate Assessment

Section 5: Information for Appropriate Assessment including information on European sites, potential impacts, and mitigation measures where required.

Section 6: Mitigation measures.

Section 7: Assessment of in-combination effects with other plans and projects.

Section 8: Conclusion in relation to adverse effects on site integrity.

Section 9: References.

This NIS should be read in full, with no excerpts to be representative of the findings. This NIS has been prepared exclusively for EirGrid and no liability is accepted for any use or reliance on the NIS by third parties (with exclusion of the competent authority). This report has been prepared from data available at the time means the report is for of writing. Where assumptions have been necessary, these are clearly described.

2. Methodology

2.1 Desk review

The following resources were analysed to inform the baseline description of the site and surrounding environment:

- Aerial imagery (Bing, Google Earth, ESRI) (November 2022, December 2023 & February 2024).
- Environmental Protection Agency (EPA) rivers and water quality data Water Framework Directive (WFD) status online at https://gis.epa.ie/EPAMaps/ (accessed November 2022, December 2023 & February 2024).
- Mapping of European site boundaries available online at www.npws.ie (accessed November 2022, December 2023 & February 2024).
- Protected species data from the National Biodiversity Data Centre online at http://www.biodiversityireland.ie/ (accessed November 2022, December 2023 & February 2024).
- National Parks and Wildlife Service (2019a). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill. Article 17 Reports 2019 | National Parks & Wildlife Service (npws.ie) (accessed November 2022, December 2023 & February 2024).
- National Parks and Wildlife Service (2019b). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill. Article 17 Reports 2019 | National Parks & Wildlife Service (npws.ie) (accessed November 2022, December 2023 & February 2024).
- National Parks and Wildlife Service (2019c). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill. Article 17 Reports 2019 | National Parks & Wildlife Service (npws.ie) (accessed November 2022, December 2023 & February 2024).
- National Parks and Wildlife Service (2021). Rye Water Valley/Carton SAC 001398. Conservation Objective Series, version 1 (accessed November 2022, December 2023 & February 2024).
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including: the Natura 2000 network Data Form; Site Synopsis; Generic Conservation Objective data (accessed November 2022, December 2023 & February 2024).
- Other open-source information available online regarding fisheries (e.g., www.salmonireland.com and www.fishingireland.info) (accessed December 2023 & February 2024).
- Protected and invasive species data from the National Biodiversity Data Centre (NBDC) online at http://www.biodiversityireland.ie/ (accessed November 2022, December 2023 & February 2024).

2.2 Surveys

Site visits along the route of the proposed cable were undertaken multiple times in 2021 and 2022 beginning on 11/10/2021, by experienced Jacobs ecologists: Survey leads were Dr Susie Coyle (Senior Associated Director of Ecology), Corey Cannon (Principle Ecologist), Anthony Robb (Senior Ecologist), May Higgins (Graduate Ecologist (at time of survey)) and Laura O'Neill (Graduate Ecologist (at time of survey)). The study area was determined following best practice guidance (Chartered Institute of Ecology and Environmental Management (CIEEM) 2018) and by professional judgment, taking into account the likely significant effects from the Proposed Development on the receiving environment during construction and / or operation. Surveys included wintering and breeding birds, mammals, fish invertebrate and habitats (see below).

The survey area for terrestrial habitats (including rare and / or protected flora, and non-native invasive plant species) was a corridor along the Proposed Development where works are proposed and habitats that could be directly or indirectly affected during construction / operation. Habitats within a minimum of 150 m of the Proposed Development i.e. from the Planning Application Boundary) were mapped using a combination of survey and aerial

photographs. All hedgerows / tree lines at proposed joint bays were inspected and where vegetation could be impacted / lost, e.g., narrow roads. Habitats classified using A Guide to Habitats in Ireland (referred to as Fossitt 2000) (reprinted in 2007) (The Heritage Council 2000).

The survey area for wintering birds were carried out for all the route options as a preferred route was not available at that time. Each of the four route options (See Chapter 4 of the EIAR for further details) was surveyed to 800 m on either side of the option from vantage points and drive-by. This was considered the distance in which birds count be directly or indirectly affected by construction/operation operations. Therefore, some birds were recorded up to 9 km away from the Proposed Development and are included in the results to provide as much data as possible. The survey focused on areas of suitable habitat for foraging / roosting winter birds, including waterbodies and wetlands.

The survey area for breeding birds was corridor along the Proposed Development where works are proposed, and in locations where breeding birds could be directly or indirectly affected during construction / operation. Transect surveys (17 transects completed) undertaken predominantly within a 250 m survey corridor however, extended outside of the 250 m corridor on occasions at transects 1. The surveys focused on areas of suitable bird nesting habitat.

The survey area for bats comprised trees / structures potentially directly impacted by the Proposed Development during construction / operation were surveyed for potential bat roosts (i.e. those within the Planning Application Boundary). Trees with identified bat roost potential were subject to emergence / return surveys. Static detectors were also deployed at key locations for a minimum of five days for each deployment.

The survey area for faunal species was a corridor of 100 m from the Proposed Development was surveyed for fauna species that could be directly or indirectly affected during construction/operation of the Proposed Development. The study area extended to 150 m from the Proposed Development and beyond if required (i.e. along watercourses hydrologically linked to the Planning Application Boundary.

Aquatic habitats assessment was carried out at watercourse crossing points and a minimum of 100 m to either side of the Proposed Development Planning Application Boundary where possible were visually assessed for their potential to support fish of conservation interest and white-clawed crayfish. Assessments identified sites that had appropriate habitat to support different age classes of fish and in particular for spawning and juvenile nursery areas. White-clawed crayfish habitat was assessed for features that provide suitable refuge such as substrates large enough to provide cover and not armoured.

Following the aquatic habitats assessment, eDNA samples was undertaken at eleven waterbodies (rivers / tributaries) considered to have the potential to support the following species: Atlantic salmon (*Salmo salar*), European eel (*Anguilla anguilla*) and White clawed crayfish (*Austropotamobius pallipes*).

The survey area for marsh fritillary comprised habitats within c. 100 m of the Proposed Development and were assessed for their suitability to support marsh fritillary butterfly. Incidental sightings of marsh fritillary and other terrestrial invertebrates of conservation interest were recorded where present.

During the visits, habitats within the survey area as described about were assessed for their potential to support rare or protected species and/or qualifying interests (Annex I habitats or Annex II species) associated with European sites. The distance of the habitat assessed from the Proposed Development ranged from immediately adjacent up to 150 m from it. Visual watercourse assessments were up to 150m from cable crossing points and a minimum of 100 m to either side where possible. The assessment of protected species and habitats and/or invasive species was undertaken in line with the following guidelines and informed this AA NIS:

- A Guide to Habitats in Ireland. The Heritage Council (Fossitt, 2000).
- Article 17 reports (NPWS, 2019a, 2019b, and 2019c).
- CIEEM Good Practice Guidance for Habitats and Species (CIEEM, 2021).
- CIEEM Guidelines for Preliminary Ecological Appraisal. Second Edition (CIEEM, 2017).

- CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018).
- Ecological Surveying Techniques for Protected Flora and Fauna (Nationals Road Authority, 2009)
- Interpretation Manual of European Habitats (European Commission DG Environment, 2013)
- National Roads Authority (NRA) Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010).
- The Irish Vegetation Classification (Perrin et al., 2018)
- Transport Infrastructure Ireland (TII) The Management of Invasive Alien Plant Species on National Roads, Standard (TII, 2020a).
- Transport Infrastructure Ireland (TII) The Management of Invasive Alien Plant Species on National Roads, Technical Guidance (TII, 2020b).

Ecology Surveys and their dates are shown in Table 2.

Table 2.2. showing all ecological surveys carried out for the Kildare to Meath proposed development.

Species/Habitat	Survey methodology/target species	Survey date(s)
Habitat Survey	Habitat classification (Fossitt, IVC etc.)	June 2022 – October 2022 (Week commencing: 06.06.2022, 27.06.2022, 11.07.2022, 18.07.2022, 22.08.2022, 05.09.2022, 26.09.2022, 12.10.2022)
Habitat Suitability Assessment	Reptile and amphibian	December 2021 – June 2022 (weeks commencing 13.12.21; 27.6.22)
	Terrestrial invertebrate (Marsh fritillary)	December 2021 – April 2022 weeks commencing 13.12.21; 27.6.22
	Fish white-clawed crayfish	June 2022 – October 2022 (Week commencing: 06.06.2022, 27.06.2022, 11.07.2022, 18.07.2022, 22.08.2022, 05.09.2022, 26.09.2022, 12.10.2022)
Mammal Survey	Mammal species other than bats i.e., otter, badger, red squirrel etc.	October 2021 – April 2022, October 2023
Birds	Winter Bird Surveys	October 2021 – April 2022 (Week commencing: 11.10.2021, 01.11.2021, 06.12.2021, 10.01.2022, 07.02.2022, 07.03.2022, 11.04.2022)
	Hen harrier winter roost surveys	October 2021 – March 2022 (Week commencing 11.10.2022, 18.10.2022, 01.11.2021, 06.12.2021, 10.01.2022, 07.02.2022, 07.03.2022)
	Breeding bird surveys	March – May 2022

Species/Habitat	Survey methodology/target species	Survey date(s)
		(Week commencing: 28.03.2022, 25.04.2022, 23.05.2022, 30.05.2022)
Bats	Identification of potential roost features (PRFs) in trees/buildings	February 2022 – September 2022 (week commencing 21.2.22; 21.3.22; 6.6.22; 15 .7.22; 22.8.22; 5.9.22;
	Static detector surveys	May 2022 – August 2022 (Week commencing 16.05.2022, 23.05.2022, 30.05.202, 06.06.2022, 27.06.2022, 04.07.2022, 18.07.2022, 25.07.2022, 01.08.2022, 08.08.2022)
	Emergence/re-entry surveys (structures and trees)	May 2022 – July 2022 (Week commencing 16.05.2022, 23.05.2022, 30.05.2022, 06.06.2022, 17.06.2022, 18.07.2022, 25.07.2022)
Fish	Edna Sampling for Atlantic salmon and European eel	August 2022 – September 2022 (Week commencing: 08.08.2022, 19.09.2022)
Invertebrates	Edna Sampling for white-clawed crayfish	August 2022 – September 2022 (Week commencing: 08.08.2022, 19.09.2022)
Smooth newt	Edna Sampling for smooth newt at WB19 and WB05.	August 2022 – October 2022 (Week commencing: 08.08.2022, 19.09.2022, 10.10.2022)

2.3 Consultation

The following consultation has taken place and all consultees response taken into consideration in this NIS as appropriate:

- Meath County Council (16/01/2023) – Discussions on design options and positioning of joint and passing bays and loss and replacement of vegetation, specifically trees and hedgerows. Agreed that the design will be refined and cable will generally follow footpaths and use existing watercourse crossing where possible. General impacts to European Sites are from physical loss of supporting habitat, mortality, habitat degradation / changes in water quality (pollution, hydrological/ hydrogeological changes) and disturbance. Mitigation measures as set out Appropriate Assessment should be conditional. Potential impacts and mitigation were considered in the assessment in Sections 4, 5.1.4 and 6 and also into the in-combination in Section 7.
- Kildare County Council (11/01/2023) – Discussions on design options and positioning of joint and passing bays and loss and replacement of vegetation, specifically trees and hedgerows. Noted that the Proposed Development should be subject to Screening for Appropriate Assessment and where applicable as Stage 2 is carried out and that the Proposed Development should have regard for protected species and provide mitigation and monitoring where applicable. A summary of the Screening for Appropriate Assessment is provided in Section 4, potential impacts and mitigation were considered in the assessment in Sections 4, 5.1.4 and 6 and also into the in-combination in Section 7.

- NPWS (07/02/2023) – Raise a query regarding HDD as to what fluids are used in the process and whether these could be environmentally friendly. Effects from a pollution event due to drilling fluid/bentonite breakout are include in the assessment of impacts and mitigation measures for drilling fluid/bentonite breakout are detailed in Section 6.2. Invasive species survey method was queried. Invasive species are considered in the NIS and survey methods are detailed in Section 2.2 and results in Section 3.1.4. Queried if 150 m survey area informed otter surveys and confirmed that was the case. Otters were included in the assessment as a QI of River Boyne and River Blackwater SAC. Due to the SAC being in a separate catchment and the unlikelihood of otter being present due to mean extent of territories exceeding the distance from the SAC to the Proposed Development the SAC was screened out of the assessment.
- Inland Fisheries Ireland (17/01/2023) – Queried and advised on crossing methods at watercourses. Effects on watercourses hydrologically linked to European sites are included in the assessment and timing of works, construction methods and pollution control measures are detailed in Section 6.1 and 6.2.
- Waterways Ireland (01/06/2022) – Did not provide any comments relevant to the assessment.
- An Bord Pleanála pre-application consultation: (15/09/2022;15/12/2022; and 16/02/2023) - The meetings included discussions on the Proposed Development, the form of the submission, and on the AA screening Report and NIS. These discussions did not involve technical ecological discussions but related to the form of the documents and recent case law that would affect the approach to Appropriate Assessment. A summary of how case law has established how an Appropriate Assessment is lawfully conducted is presented in Section 2.5.

2.4 Guidance documents

This NIS was undertaken in-line with the following guidance in addition to guidance detailed in Section 2.2:

- Appropriate Assessment Screening for Development Management. OPR Practice Note PN01 (OPR, 2021).
- Appropriate Assessment of Plans and Proposed Schemes in Ireland. Guidance for Planning Authorities (Department of Environment, Heritage and Local Government (DoEHLG), 2010).
- Assessment of Plans and Projects in Relation to Natura 2000 Sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021a)
- Communication from the Commission on the Precautionary Principle (EC, 2000).
- Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission (EC, 2007).
- Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018).
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021b).
- Guidance on the strict protection of certain animal and plant species under the Habitats Directive in Ireland (Department of Housing, Local Government and Heritage (DHLGH), 2021).
- Commission Notice: Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (2021/C 437/01)

2.5 Appropriate Assessment methodology

Following screening and where the potential for LSEs has been identified the assessment is progressed to the next step, known as Stage 2 AA.

Stage 2 AA is a focused and detailed examination, analysis and evaluation carried out by the competent authority of the implications of the plan or project, alone and in-combination with other plans and projects, on the integrity of a European site in view of that site's conservation objectives. Case law has established that such an Appropriate Assessment, to be lawfully conducted, in summary:

(37) must identify, in the light of the best scientific knowledge in the field, all aspects of the proposed development which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;

(ii) must contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps; and

(iii) may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where the competent authority decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects. If adverse impacts can be satisfactorily avoided or successfully mitigated at this stage, so that no reasonable doubt remains as to the absence of the identified potential effects, then the process is complete. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must proceed to stage three and, if necessary, stage four.

The process is shown in Figure 2.1, below:

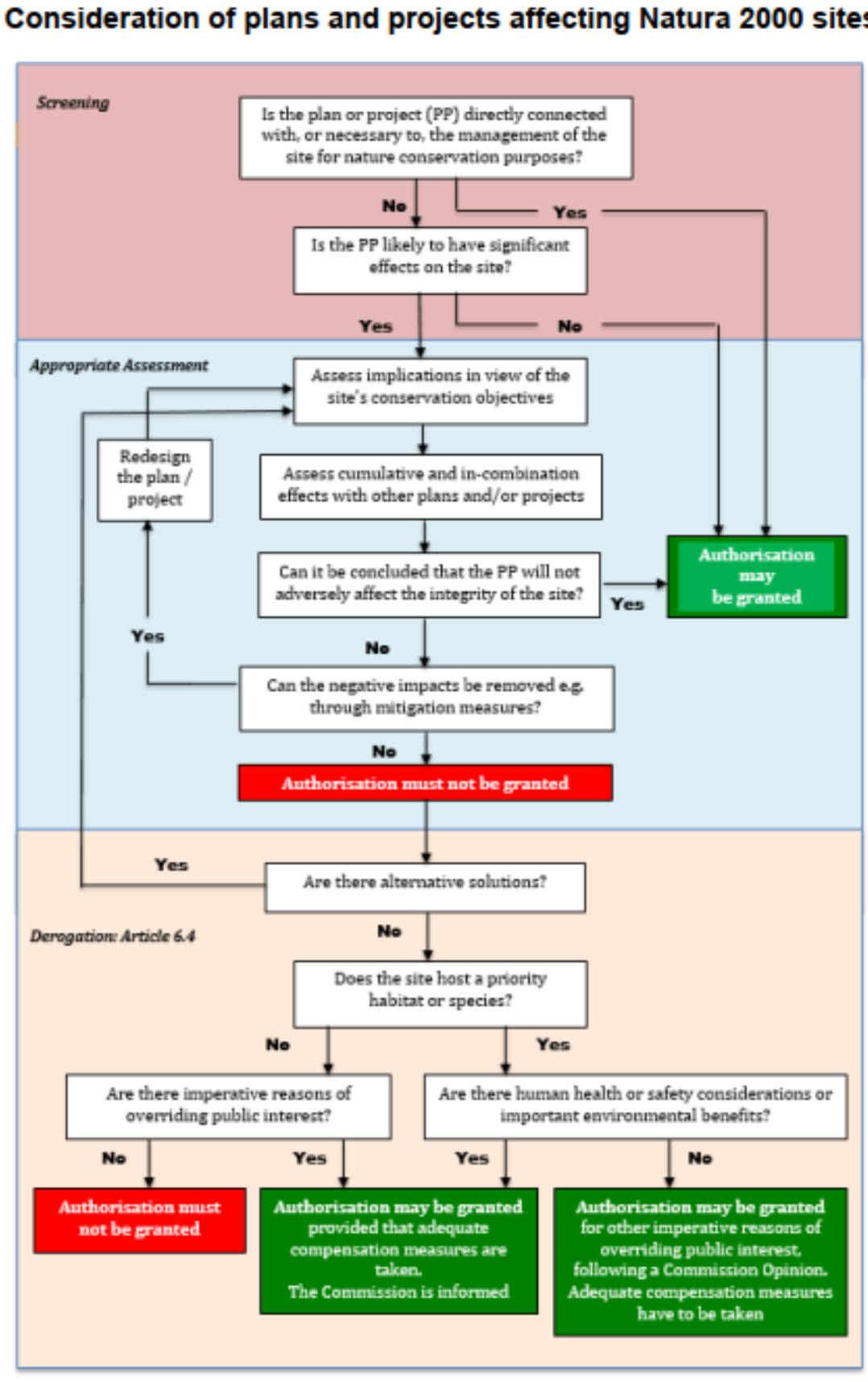

Figure 2.1. Flow chart of Article 6 (3) and (4) procedure (European Commission, 2018).

3. Baseline characterisation

3.1 Receiving Environment

To note, the full baseline for the ZoI is provided in the AA Screening Report. The survey area is set out in Section 2.2. Habitats were assessed for mobile species from EU sites that may be within ZoI for the Proposed Development and therefore habitat assessment was carried out to at least 150m to understand functionally liked land and wintering bird surveys extended to 800m which mobile QI birds could be affected by the project.

The results of the desk-based review and site visits are presented in the following sections

3.1.1 Habitats

No Annex I habitats other than those associated with European sites (Table 5.1) and nationally designated sites were identified from the desk study. No Annex I habitats associated with any of the SAC habitats listed in Section 3.1.2, were recorded during the survey

The study area comprised predominantly agricultural grasslands with some arable fields, built surfaces, and hedgerows and treelines between Dunstown substation in the townland of Dunnstown in Co. Kildare and Woodland substation in the townland of Woodland in Co. Meath.

3.1.2 European sites

The ZoI was identified by applying the source-pathway-receptor model. The source was water-based impacts that could be travel along a watercourse to the receptor. Applying the source-pathway-receptor model, two European sites were found within the ZoI of the Proposed Development: the Rye Water Valley/Carton SAC and the River Boyne and River Blackwater SAC. However, the AA screening of River Boyne and River Blackwater SAC concluded that it can be excluded, on the basis of objective information, that the Proposed Development will, individually or in combination with other plans or projects, have a significant effect on this site. The location of Rye Water Valley/Carton SAC is shown in Figure 1 (321084AH-JAC-ZZ-XX-DR-K-3036), Appendix A. The Proposed Development will be 6.2km west at its closest distance from the SAC (at Dolanstown). The shortest hydrological distance between the Proposed Development and this SAC is 8.15km, commencing at Kilcock (Rye Water, WB13, as shown in Figure 2 (321084AH-JAC-ZZ-XX-DR-K-3037), Appendix B).

3.1.2.1 Summary of Site Synopses Rye Water Valley/Carton SAC

The Rye Water Valley/Carton SAC is located between Leixlip and Maynooth, in Counties Meath and Kildare, and extends along the Rye Water, a tributary of the River Liffey. The site is a SAC selected for the following habitats and species on Annex I/II of the EU Habitats Directive. The numbers in brackets are Natura 2000 codes:

- Petrifying Springs [7220];
- Narrow-mouthed whorl snail (*Vertigo angustior*) [1014]; and
- Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016].

The following site description is from the synopsis for the site (NPWS, 2013) – "The Rye Water in Carton Estate is dammed at intervals, creating a series of lakes. RReed sweet-grass (*Glyceria maxima*) is frequent around the lakes, along with yellow iris (*Iris pseudacorus*), reed canary-grass (Phalaris arundinacea), bulrush (*Typha latifolia*), water forget-me-not (*Myosotis scorpioides*), marsh-marigold (*Caltha palustris*) and starworts (*Callitriche* spp.). Along the remainder of the site the river has been dredged and much of the reed fringe removed."

To the north-west of Carton Bridge a small clump of willows (*Salix* spp.), with dogwood (*Cornus* sp.), alder (*Alnus glutinosa*), ash (*Fraxinus excelsior*) and elder (*Sambucus nigra*) occurs. The ground flora found here includes golden saxifrage (*Chrysosplenium oppostifolium*), meadowsweet (*Filipendula ulmaria*), common valerian (*Valeriana officinalis*), wavy bitter-cress (*Cardamine flexuosa*) and bittersweet (*Solanum dulcamara*).

The marsh, mineral spring and seepage area found at Louisa Bridge supports a good diversity of plant species, including stoneworts, marsh arrowgrass (*Triglochin palustris*), purple moor-grass (*Molinea caerulea*), sedges

(*Carex* spp.), common butterwort (*Pinguicula vulgaris*), marsh lousewort (*Pedicularis palustris*) and grass-of-parnassus (*Parnassia palustris*). The mineral spring found at the site is of a type considered to be rare in Europe and is a habitat listed on Annex I of the E.U. Habitats Directive. The Red Data Book species Blue Fleabane (*Erigeron acer*) is found growing on a wall at Louisa Bridge.

The rare narrow-mouthed whorl snail and Desmoulin's whorl snail occur in marsh vegetation near Louisa Bridge. Both are rare in Ireland and in Europe and are listed on Annex II of the E.U. Habitats Directive. The scarce dragonfly, *Orthetrum coerulescens*, has also been recorded at Louisa Bridge.

The conservation importance of the site lies in the presence of several rare and threatened plant and animal species, and the presence of petrifying springs, a habitat type listed on Annex I of the E.U. Habitats Directive. (NPWS, 2013).

3.1.2.2 Qualifying Interest Habitats – Rye Water Valley/Carton SAC

3.1.2.2.1 Petrifying springs with tufa formation (*Cratoneurion*) [7220]

Petrifying springs are lime rich water sources which deposit tufa. The emerging spring water is rich in carbon dioxide and dissolved calcium carbonate. On contact with the atmosphere, carbon dioxide is outgassed and calcium carbonate is deposited as tufa. The resulting ecological conditions, with high Ph and constant inundation by water and deposition of precipitated calcium carbonate, constitute a challenging environment for plants and animals to colonise and the communities associated with petrifying springs are therefore highly specialised. The ecological significance of petrifying springs is seldom confined to a point source; rather there is often a continuum of intergrading hydrological conditions from the spring head, through a flushed slope and into small streams. Spring head may be distinct point locations giving rise to small streams immediately below the point of emergence or water may seep to the surface in a more diffuse pattern over a larger area (Lyons and Kelly, 2016).

Irish petrifying spring vegetation has been classified into eight plant communities. The spring vegetation at Louisa Bridge within Rye Water Valley/Carton SAC lies within Group 6: *Carex lepidocarpa* small sedge springs. This species-rich site contains a complex of springs, flushes and pools with paludal tufa, oncoids/ooids and marl. Tufa-forming springs and flushes are generally dominated by graminoid species, especially *Carex lepidocarpa C. panicea* and *Festuca rubra*, along with *Carex flacca, C. dioica, Eleocharis quinqueflora, Eriophorum angustifolium, Juncus articulatus* and *J. inflexus*. Bryophytes are abundant and locally dominant, with *Palustriella commutata, P. falcata, Scorpidium cossonii, Campylium stellatum, Fissidens adianthoides, Bryum pseudotriquetrum, Aneura pinguis* and *Riccardia chamedryfolia*. Forbs include *Anagallis tenella, Pinguicula vulgaris, Parnassia palustris, Samolus valerandi, Triglochin palustris, Crepis paludosa, Mentha aquatica* and *Succisa pratensis* (Lyons and Kelly, 2016).

The main area of petrifying springs with tufa formation within Rye Water Valley/Carton SAC is at Louisa Bridge and is estimated to have an area of 1250m^2 (Lyons, 2015). This seepage complex is irrigated by two independent spring systems which differ in the chemical composition of the spring waters (Lyons, 2015; Lyons and Kelly, 2016). The separate water sources comprise a deeper, older and warmer artesian groundwater system with high concentrations of sodium and chloride, and a more recent, shallow alkaline groundwater system (Kuczynska and Bartley, 2008). The water from the two sources mixes as it trickles down the hillside towards the Water River, creating a series of shallow pools and paludal habitats (Lyons, 2015).

At Louisa Bridge, the main vegetation community was long stalked yellow sedge (*Carex lepidocarpa)* small sedge springs (NPWS, 2021). Two indicators of local distinctiveness were present, narrow-mouthed whorl snail and Desmoulin's whorl snail. These are also QI species of this SAC and are described below.

3.1.2.3 Qualifying interest species – Rye Water Valley/Carton SAC

The desk-based review of the NBDC did not return any records of the QI species for which Rye Water Valley/Carton SAC is designated, within 2km of the Proposed Development. The desk-based assessment extended to 2 km based

on CIEEM guidance and professional opinion. Information was used from site synopses and conservation objectives as part to the desk-based review.

3.1.2.3.1 Narrow-mouthed whorl snail (*Vertigo angustior*)

Narrow-mouthed whorl snail was last recorded at Rye Water Valley/Carton SAC in 1997, within the 1km grid square, N9936 and the species was not found in surveys carried out in 2006, 2010 or 2016 (NPWS, 2021). All whorl snails favour damp or wet habitats where they live mostly in moss, leaves and decaying vegetation. They feed on bacterial films and decaying vegetation. They are sensitive to changes in hydrology and dampness of the habitat. Habitats they occupy include dunes, damp grassland, fen and marsh, salt marsh and flood plain. Occupied habitats may be elongated narrow zones in wetlands or extensive dune and coastal grassland sites (NPWS, 2019c).

3.1.2.3.2 Desmoulin's whorl snail (*Vertigo moulinsiana*)

Desmoulin's whorl snail is known from one site in Rye Water Valley/Carton SAC, at Louisa Bridge (NPWS, 2021). All whorl snails favour damp or wet habitats where they live mostly in moss, leaves and decaying vegetation. They live on living and dead stems and leaves of tall wetland plants and feed on bacterial films and decaying vegetation. They require tall, structured vegetation containing tall riparian grasses and sedges, particularly reed sweet grass, common reed, greater pond sedge and *Cladium*. Sites are usually at the end of hydroseral succession and unmanaged, allowing the build-up of litter. As well as tall vegetation structure it requires stable hydrology with the water table at or slightly above the ground surface for much of the year and low amplitude seasonal flooding. It climbs tall vegetation in the summer autumn but in severe conditions aestivates on the lower leaves of plants. In winter it descends to the leaf litter and becomes less active (NPWS, 2019c).

3.1.3 Aquatic Environment

Waterbodies (WB) crossed by the Proposed Development that have connectivity to Rye Water Valley/Carton SAC are presented in Table 3.1 and Figure 2 (321084AH-JAC-ZZ-XX-DR-K-3037), Appendix B. The table shows the waterbodies in the study area according to the EPA maps and their status and risk according to the Water Framework Directive (WDF)[3].

Table 3.1 Waterbodies crossed by the Proposed Development. Waterbodies with hydrological connectivity to the Rye Water Valley/Carton SAC.

Waterbody number (WB)	Waterbody name (WFD)	Waterbody location – Grid reference	EU Code	WFD status 2016 – 2021	Risk rating
WB03	Rye Water_030	N 93930 45180	IE_EA_09R010400	Poor	At risk
WB04	Jenkinstown Stream_010	N 91730 45313	IE_EA_09J010950	Moderate	At risk
WB07	Jenkinstown Stream_010	N 89775 43468	IE_EA_09J010950	Moderate	At risk
WB08	Jenkinstown Stream_010	N 89661 43153	IE_EA_09J010950	Moderate	At risk
WB09	Unassigned stream	N 89419 43023	Unassigned stream	Unassigned stream	Unassigned stream

[3] The connectivity of all water crossings of the Proposed Development to European sites was assessed using Environmental Protection Agency maps (https://gis.epa.ie/EPAMaps/).

Waterbody number (WB)	Waterbody name (WFD)	Waterbody location – Grid reference	EU Code	WFD status 2016 – 2021	Risk rating
WB10	Rye Water_020 (Brides Stream)	N 89243 42178	IE_EA_09R010300	Good	Under review
WB12	Rye Water_010	N 88410 40767	IE_EA_09R010300	Good	Under review
WB13	Rye Water_010	N 88065 40613	IE_EA_09R010100	Moderate	At risk
WB14	Royal Canal	N 87874 40210	IE_09_AWB_RCMLE	Good	Under review

3.1.4 Invasive species

A search of the NBDC identified a number of records of invasive species within 2km of the Planning Application Boundary (see Table 3.2: Records of Invasive species within 2km of the Planning Application Boundary (NBCD 2023)).

Table 3.2: Records of Invasive species within 2km of the Planning Application Boundary (NBCD 2023) (Species in Bold are Designated as Third Schedule Invasive Species)

Common Name	Scientific Name	Species group	Location grid	Designation	Impact
American mink	*Mustela vison*	terrestrial mammal	Throughout all the Proposed Development cable route	Regulation S.I. 477 (Ireland)	High
Brown rat	*Rattus norvegicus*	terrestrial mammal	Throughout all the Proposed Development cable route	Regulation S.I. 477 (Ireland)	High
Budapest slug	*Tandonia budapestensis*	mollusc	In grid N81, N84 that the Proposed Development overlies	N/A	Medium
Cherry laurel	*Prunus laurocerasus*	flowering plant	In several location within Proposed Development including grids: N885195, N856230, N853246, N838250, N83	N/A	High
Common garden snail	*Cornu aspersum*	mollusc	In several location within Proposed Development included in grids: N81, N82, N84 that the Proposed Development overlies	N/A	Medium
Eastern grey squirrel	*Sciurus carolinensis*	terrestrial mammal	Throughout all the Proposed Development cable route	EU Regulation No. 1143/2014 Regulation S.I. 477 (Ireland)	High
European rabbit	*Oryctolagus cuniculus*	terrestrial mammal	Throughout all the Proposed Development cable route	N/A	Medium
Fallow deer	*Dama dama*	terrestrial mammal	Within 2km of the Proposed Development (grid N867125)	Regulation S.I. 477 (Ireland)	High
Greater, white-toothed shrew	*Crocidura russula*	terrestrial mammal	In several location within and in the vicinity (2km) of the Proposed Development, such as	N/A	Medium

Common Name	Scientific Name	Species group	Location grid	Designation	Impact
			in grids N881199, N892202, N889202, N870208, N856297		
Harlequin Ladybird	*Harmonia axyridis*	Insect – beetle	Found in a location in the proximity of Proposed Development (within 2 km) (grid N902204)	Regulation S.I. 477 (Ireland)	High
Japanese knotweed	*Reynoutria japonica*	flowering plant	In several location within Proposed Development included in grid: N81	Regulation S.I. 477 (Ireland)	High
Jenkins' spire snail	*Potamopyrgus antipodarum*	mollusc	In several locations included in grids N81, N82, N83, that the Proposed Development overlies	N/A	Medium
New Zealand flatworm	*Arthurdendyus triangulatus*	flatworm	In the vicinity of the Proposed Development (grid N895230)	N/A	High
Parrot's-feather	*Myriophyllum aquaticum*	flowering plant	Within the Proposed Development (including in grids N8327, N8939)	EU Regulation No. 1143/2014 Regulation S.I. 477	High
Spanish bluebell	*Hyacinthoides hispanica*	flowering plant	Within 2 km of the Proposed Development in grids N819273, N819274	Regulation S.I. 477 (Ireland)	N/A
Sycamore	*Acer pseudoplatanus*	flowering plant	In several location included in grid N81 and N83, that Proposed Development overlies, and other scattered grids that are within 2 km from it (e.g.N867278, N9645)	N/A	Medium
Three-cornered garlic	*Allium triquetrum*	flowering plant	Within 2 km from Proposed Development in grid N889404	Regulation S.I. 477 (Ireland)	Medium

Himalayan balsam was recorded during the field survey along the River Liffey at approximately ITM E687941, N724498 and in the back garden of a private residence at E687974, N724322.

4. Conclusion of Screening for Appropriate Assessment

An Screening Report for AA of the Proposed Development is presented in Appendix C, and its assessment of LSEs presented in Table 4.1.

Following an assessment of the relevant objective scientific information, applying the precautionary principle and objective criteria, the professional opinion of the authors of the AA Screening Report concluded that it was not possible to exclude that the Proposed Development, alone and in-combination with other plans or projects, will have a significant effect on the following European sites in view of the site's conservation objectives:

- Rye Water Valley/Carton SAC (Site code 001398).

The potential for significant effects on this European site could not be excluded, including the potential for significant effects associated with:

Changes in water quality because of a pollution event from spillages, sedimentation/ silt run off and fuel/ oil leaks entering watercourses during construction works impacting on Rye Water Valley/Carton SAC QI habitat Petrifying springs with tufa formation (*Cratoneurion*) [7220] and QI species, Narrow mouthed whorl snail (*Vertigo angustior*) [1014] and Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016] screened in this European site.

It was therefore recommended that a Stage 2 Appropriate Assessment of the Proposed Development be undertaken. The assessment is required to determine if the Proposed Development could have adverse effects on the integrity of the European site above, either alone or in combination with other plans or projects, in light of its site's structure and function and site's conservation objectives. The information presented in the NIS is intended to provide sufficient information for the relevant competent authority to carry out the Appropriate Assessment.

The River Boyne and River Blackwater SAC screened out as there was no potential for LSE as there is no hydrological link to the Proposed Development; there will be no direct or indirect loss of alkaline fens and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* habitats or effects from pollution, and no disturbance, mortality or pollution effect to QI otter.

Table 4.4.1: Assessment of LSEs for all the European designated sites and their QI habitats and species within the ZoI of the Proposed Development. Sites are listed according to their distance from the Proposed Development (grey text = qualifying feature which is not considered to be within the ZoI of the Proposed Development)

European site name and code	Distance of site from Proposed Development	Qualifying Interests	Description of connectivity	Potential for Likely Significant Effects (LSEs)
Special Area of Conservation (SAC)				
Rye Water Valley /Carton SAC (Site code 001398) v1. NPWS (2021)	The Proposed Development is 6.2km west at the closest distance from the SAC (at Dolanstown). The Proposed Development is in the same catchment and the shortest hydrological distance between the Proposed Development and this SAC is 8.15km, commencing at Kilcock (Rye Water, WB13)	***To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.*** **Annex I habitats:** Petrifying springs with tufa formation (*Cratoneurion*) [7220] **Annex II species:** Narrow mouthed whorl snail (*Vertigo angustior*) [1014] Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016]	**Habitat degradation (Pollution)** There is hydrological connectivity to this SAC where the Proposed Development crosses waterbodies which flow indirectly to Rye Water, since Rye Water flows through Rye Water Valley/Carton SAC. The nearest is WB13 which is 8.15km from this SAC. HDD is proposed here which could potentially cause a pollution event resulting from: • oil and fuel spillages from drilling rig operation. • inadvertent drilling fluid returns (bentonite breakout) and • drilling fluid disposal. A total of ten further waterbody crossings have hydrological connectivity with the SAC. There is potential for surface sediment run-off during construction of the Proposed Development to enter waterbodies at these locations and be transported to the SAC. Therefore, water pollution incidents at these watercourses have the potential to indirectly affect the SAC's qualifying habitats and species. There are no potential effects from invasive species recorded during field surveys as the locations of the infestations are not hydrologically linked to the SAC. Petrifying springs have exacting water level and quality requirements and are therefore potentially susceptible to a water pollution/ hydrological incident.	**LSE cannot be excluded** Petrifying springs with tufa formation (*Cratoneurion*), narrow mouthed whorl snail and Desmoulin's whorl snail screened in on a precautionary basis as all the SAC QI could be indirectly impacted by pollution caused by inadvertent drilling fluid returns from HDD in WB13 and/or surface sediment run-off into one of the connecting watercourses. **Screened in**

European site name and code	Distance of site from Proposed Development	Qualifying Interests	Description of connectivity	Potential for Likely Significant Effects (LSEs)
			Desmoulin's whorl snail was recorded at the SAC in the 2014-2017 survey season (Long and Brophy, 2019) while narrow mouthed whorl was last recorded on the site in 1997 (NPWS, 2021b). There is potential that the snail's food supply could become contaminated and inedible from pollution, thus potentially causing the snail to starve. There are no other types of ecological connectivity between the Proposed Development and the SAC. Further assessment needed. **Direct mortality** Desmoulin's whorl snail is restricted to calcareous wetlands where it lives on reed grasses and sedges. Such habitat does not connect the SAC to the Proposed Development area, so there is no likelihood of direct mortality of this species from habitat loss. Narrow mouthed whorl snail is found primarily in marshy ground of high, even humidity, with flowing groundwater, but subject neither to deep or prolonged flooding nor to periodic desiccation. It requires unshaded conditions and lives amongst short vegetation, composed of grasses, mosses or low herbs, that is quickly warmed by the sun. The vegetation may be grazed. Such habitat does not connect the SAC to the Proposed Development area, so there is no likelihood of direct mortality of this species from habitat loss. No further consideration needed.	
River Boyne and River Blackwater SAC (site code: 002299)	The Proposed Development is 14.2km from the SAC at its closest location. There is no hydrological link.	***To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.*** **Annex I habitats:**	**Habitat loss**	**LSE can be excluded** LSEs can be excluded, alone and in combination with other plan or projects, as there is no potential for habitat loss as the SAC is 14.2km

European site name and code	Distance of site from Proposed Development	Qualifying Interests	Description of connectivity	Potential for Likely Significant Effects (LSEs)
(NPWS, 2018).		*Alkaline fens* *Alluvial forests with Alnus glutinosa and Fraxinus excelsior* **Annex II species:** River lamprey Salmon Otter (potential effect pathway identified)	The Proposed Development is 14.2km from the SAC at its nearest location, so there is no potential for direct loss of SAC habitat. The SAC is in a separate catchment therefore there is no hydrological link. No further consideration needed. **Disturbance** Otter is a qualifying feature of the River Boyne and River Blackwater SAC, and otter signs were recorded close to the Proposed Development during the Jacobs 2021/22 survey season as follows: • potential otter holt was recorded along the River Liffey at approximately ITM E687929 N724445, (this grid reference lies along the route the proposed HDD where it crosses the River Liffey, WB35. • an otter slide at approximately ITM E687940, N724511 (this grid reference lies approximately 16m east of the cable route. The Proposed Development is located 14.2km south-east of the SAC at its closest point. The otters present adjacent to the River Liffey are in a different catchment to those in the SAC, and the otter signs are approximately 28km south-east of the SAC at its nearest point. The Proposed Development lies 14.2km from this SAC at its nearest point, and a male otter's territory is 13.2 ± 5.3km[4]. However, as there are no other rivers designated for otters between the SAC and the proposed works, the SAC is considered the core area for otters, rather than in intervening rivers and tributaries. As the SAC extends for approximately 65km to the Baltry Estuary, is it considered that otters are more likely to remain in the River Boyne and River	distance from the Proposed Development or effects from pollution as the SAC is in a separate catchment and therefore there is no effects pathway. Effects on otter are not likely as although the SAC is in a separate catchment and otter can travel over land the distance to the nearest point of the Proposed Development exceeds the mean territorial range (13.2km) for otter. Further, as the SAC extends for approximately 65km to the Baltry Estuary, is it considered that otters are more likely to remain in the River Boyne and River Blackwater SAC catchment than to migrate into Liffey catchment and as such this QI is unlikely to be present. **Screened out**

[4] National Otter Survey of Ireland 2010/12, published by the National Parks and Wildlife Service (2013)

European site name and code	Distance of site from Proposed Development	Qualifying Interests	Description of connectivity	Potential for Likely Significant Effects (LSEs)
			Blackwater SAC and/Boyne catchment than to migrate into Liffey catchment. Therefore, the Proposed Development is not considered to have a likely significant effect on otters, a QI of this SAC. No further consideration needed. **Direct mortality** As described in the paragraph above the proposed route lies close to the otter signs on the River Liffey. However, as the otters at this location belong to a different population to those of the River Boyne and River Blackwater SAC, the interest feature of the SAC will not be impacted by the Proposed Development. No further consideration needed. **Pollution** There is no hydrological pathway between the SAC and the Proposed Development since the water flowing in the River Boyne and River Blackwater lies in the Boyne catchment rather than the Liffey and Dublin Bay catchment, the location of the Proposed Development. Consequently, there is no potential for a pollution event to occur. No further consideration needed.	

5. Information for Appropriate Assessment

5.1 Rye Water Valley/Carton SAC

Rye Water Valley/Carton SAC is located between Leixlip and Maynooth, in Counties Meath and Kildare, and extends along the Rye Water, a tributary of the River Liffey. The conservation importance of the site lies in the presence of two Annex II snail species , and the presence of petrifying springs, a habitat type listed on Annex I of the E.U. Habitats Directive. Further information on the European site is presented in Section 3.1.

5.1.1 Qualifying Interests potentially exposed to risk

During the screening exercise it was found that the following QI habitats and species were exposed to LSEs from pollution events: Petrifying Springs, narrow-mouthed whorl snail and Desmoulin's whorl snail.

5.1.1.1 Petrifying Springs

Petrifying springs are springs that typically form small calcareous or 'tufa' deposits. On contact with the atmosphere at the spring head, carbon dioxide is lost from calcium saturated water to the atmosphere or is depleted by the photosynthetic activities of plants. This results in the precipitation of a calcium carbonate marl or tufa. Seepage flow rates are crucial for the development of tufa. Further information on the petrifying springs at Rye Water Valley/Carton SAC is presented in Section 3.1.2.2.1.

5.1.1.2 Narrow-mouthed whorl snail

Narrow-mouthed whorl snail was last recorded at Rye Water Valley/Carton SAC in 1997, within the 1km grid square, N9936 and the species was not found in surveys carried out in 2006, 2010 or 2016 (NPWS, 2021). Further information on narrow-mouthed whorl snail at this SAC is presented in the baseline, Section 3.1.2.3.1.

5.1.1.3 Desmoulin's whorl snail

Desmoulin's whorl snail is known from one site in Rye Water Valley/Carton SAC, at Louisa Bridge (NPWS, 2021). Further information on Desmoulin's whorl snail at this SAC is presented in the baseline, Section 3.1.2.3.2.

5.1.2 Conservation status of Qualifying Interests of Rye Water Valley/Carton SAC

The conservation status of Rye Water Valley/Carton SAC QI at national level, key conditions underpinning favourable conservation status, attributes and threats to key conditions are presented in Table 5.1. The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of Annex I habitats and Annex II species of community interest for which the site has been designated.

Table 5.1: Conservation status and key conditions of Qualifying Interests of Rye Water Valley/Carton SAC potentially exposed to risk (NPWS 2019a; NPWS, 2019b, NPWS 2019c and NPWS 2021).

QI	National Conservation Status (NPWS 2019a and b)	Site Level Status (NPWS 2021)	Key conditions supporting favourable conservation status	Main pressures and threats	Mapping available for QI
Annex I habitat Petrifying springs with tufa formation (Cratoneurion) [7220]	Inadequate	Unknown	Permanent irrigation from upwelling groundwater	Abandonment of grassland management Over and/or under grazing Roads, paths railways Recreation/human disturbance Mixed source pollution to surface and groundwaters Drainage Modification of hydrological flow Natural succession	Yes Ireland distribution shown in NPWS 2019b, page 893. Location of petrifying springs within Rye Water Valley/Carton SAC shown in NPWS, 2021.
Annex II species: Narrow-mouthed whorl snail (*Vertigo angustior*) [1014]	Inadequate	Unknown	Stable overall hydrological conditions. Permanently moist litter providing humid conditions, shaded by herbaceous or grassy vegetation but in overall open condition. Habitat must not be subject to inundation. In damp or wet habitat, this species is associated with decaying vegetation in the litter layer or damp moss in open unshaded habitats, where the openness is maintained by wetness or grazing levels.	Abandonment of grassland management Over and/or under grazing Recreation/human disturbance Development of recreational infrastructure	Yes Ireland distribution shown in NPWS 2019c, page 182 Location within Rye Water Valley/Carton SAC shown in NPWS, 2021.
Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016]	Inadequate	Unknown	Stable overall hydrological conditions. Tall growing vegetation such as tall Carex species, sometimes with black bog rush, common reed. Wet habitat – water rises under light pressure. Prefers calcareous habitat. Water table at or slightly above the ground surface and low seasonal flooding. Dispersal	Natural succession resulting in species composition change Abiotic natural processes (e.g., erosion, drying-up, salinization) Abandonment of management Over and/or under grazing	Yes Ireland distribution shown in NPWS 2019c, page 197. Location within Rye Water Valley/Carton SAC shown in NPWS, 2021.

QI	National Conservation Status (NPWS 2019a and b)	Site Level Status (NPWS 2021)	Key conditions supporting favourable conservation status	Main pressures and threats	Mapping available for QI
			requires water-borne transportation		

To determine how the project would affect Rye Water Valley/Carton SAC's Qis, this assessment has focused on the effects that may possibly occur that could undermine the conservation objectives for the site. Table 6.1 shows the QI habitat and species and associated conservation objectives of relevance to the Proposed Development. One QI habitat, i.e., petrifying springs, and two QI species i.e., narrow-mouthed whorl snail and Desmoulin's whorl snail potentially exposed to risk from the Proposed Development.

Locations of QI features within Rye Water Valley/Carton SAC 001398 (Conservation Objectives Series, NPWS 2021, v1), all of which are downstream of the hydrological connection to the Proposed Development:

- Petrifying springs are found near to Lousia Bridge, with an area estimated to be 1250m^2. Further unsurveyed areas may be present in the SAC. These petrifying springs have a hydrological distance of 14.29km from the Proposed Development (WB13). This uncertainty over unsurveyed areas does not affect the robustness of this NIS because in determining whether SAC attributes are met, a worst case scenario was used, which considered the impact on the feature wherever in the SAC it occurs. This includes features than 14.29km.
- Narrow-mouthed whorl snail was last recorded at one site near Louisa Bridge within the 1km grid square N9936. It was not found in 2006, 2010 or 2016 (NPWS, 2021). Louisa Bridge has a hydrological distance of 14.52km to the Proposed Development (WB13)
- Desmoulin's whorl snail is known from one site in the SAC at Louisa Bridge, within the 1km grid square N9936. It was last recorded in 2018 (Long and Brophy, 2019). Louisa Bridge has a hydrological distance of 14.52km to the Proposed Development (WB13)

5.1.3 Conservation objectives

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of annexed habitats and annexed species for which an SAC has been designated. To determine how the project would affect the SAC's Qis, this assessment has focused on the effects that may possibly occur that could undermine the conservation objectives for the habitats and species.

The conservation objectives for the Rye Water Valley/Carton SAC (NPWS, 2021) are as follows:

- To restore the favourable conservation condition of petrifying springs with tufa formation (Cratoneurion);
- To restore the favourable conservation condition of narrow-mouthed whorl snail; and
- To maintain the favourable conservation condition of Desmoulin's whorl snail.

Conservation objective attributes and targets for Rye Water Valley SAC 001398 v1 are shown in Table 5.2. In this table, those attributes and targets directly related to water quality and flow are considered to have potential to undermine the conservation objectives. In contrast, those attributes and targets not directly related to water quality and flow are considered not to have the potential to undermine the conservation objectives.

Table 5.2: Conservation objective attributes and targets for Rye Water Valley SAC 001398 v1 (NPWS, 2021). Light green fill indicates potential to cause AESI as well as undermine the conservation objective of the QI.

QI	Attribute/ target	Potential to undermine conservation objectives and cause AESIa
Petrifying springs with tufa formation	Habitat area: area stable or increasing	No. The proposed water crossings will not have an impact on the water supply to the petrifying springs.
	Habitat distribution: no decline, subject to natural processes	Yes. The Proposed Development must avoid pollution of connecting watercourse crossings to avoid any potential changes to natural processes at the SAC.
	Hydrological regime: maintain appropriate hydrological regime	Yes. Pollution of surface water in connecting watercourse crossings could temporarily affect water availability to the habitat through sediments potentially blocking or altering flow ground water flows
	Water quality: maintain nitrate levels at less than 10mg/l; restore phosphate level to less than 15µg/l	No. This attribute relates to fertiliser run-off from agriculture, so is not specifically relevant to the SAC. However, to maintain water quality, the Proposed Development must not pollute the watercourse.
	Vegetation composition; community diversity: maintain variety of vegetation communities, subject to natural processes.	Yes. The Proposed Development has the potential to affect natural process by polluting connecting waterbodies from bentonite/drilling fluid break-out and/or sediments entering the connected waterbodies.
	Vegetation composition, positive/negative indicator species	Yes. The Proposed Development must avoid pollution of connecting watercourse crossings to avoid negative impacts upon water quality and botanical diversity.
	Vegetation composition: algal cover less than 2%.	No. This attribute relates to fertiliser run-off from agriculture, so is not specifically relevant to the SAC
	Vegetation structure: sward height	No. Works will not affect sward height at SAC.
	Physical structure: trampling/dung	No. Works will not affect livestock at SAC.
	Indicators of local distinctiveness	Yes. Distinct flora and fauna have the potential to be impacted by changes in water quality.
Narrow-mouthed whorl snail	Distribution: no decline in number of 1km squares this species occupies in the SAC	Yes. The Proposed Development has the potential to change the snail's distribution in the event of a pollution event in hydrologically connected waterbody.
	Occurrence in suitable habitat: restore to self-sustaining population	Yes. The Proposed Development has the potential to change the occurrence in suitable habitat in the event of a pollution event in a hydrologically connected waterbody.
	Habitat area: restore area of suitable habitat, subject to natural processes	Yes. The Proposed Development has the potential to change the habitat area suitable for this snail in the event of a pollution event in a hydrologically connected waterbody.
	Habitat quality: water levels: restore suitable hydrological regime subject to natural processes	No. The Proposed Development will not alter the hydrological regime.
Desmoulin's whorl snail	Distribution: no decline in number of 1km squares this species occupies in the SAC	Yes. The Proposed Development has the potential to change the snail's distribution in the event of a pollution event in hydrologically connected waterbody.

QI	Attribute/ target	Potential to undermine conservation objectives and cause AESIa
	Occurrence in suitable habitat: no decline, subject to natural processes.	Yes. The Proposed Development has the potential to change the occurrence in suitable habitat in the event of a pollution event in a hydrologically connected waterbody.
	Density within habitat: no decline, subject to natural processes.	Yes. The Proposed Development has the potential to change the density of snails in suitable habitat in the event of a pollution event at a hydrologically connected waterbody.
	Habitat area: area of suitable habitat stable or increasing, subject to natural processes.	Yes. The Proposed Development has the potential to change the area of suitable habitat for this snail in the event of a pollution event in a hydrologically connected waterbody.
	Habitat quality: occupied patches in at least sub-optimal condition: no decline, subject to natural processes.	No. The Proposed Development has no potential to change the sub-optimal condition of the site.
	Habitat quality; soil wetness: no decline subject to natural processes.	No. The Proposed Development has no potential to change the flow regime and therefore the soil wetness.

5.1.4 Appraisal of potential impacts on Rye Water Valley/Carton SAC

The following section assesses the potential for a pollution event at waterbodies crossed by the Proposed Development to affect the conservation objectives of Rye Water Valley/Carton SAC due to potential impacts on its three QI.

5.1.4.1 Petrifying springs with tufa formation

Potential impact – potential for pollution event at watercourse crossings

Details of the two methods used for watercourse crossings are given in Section 1.2.3.4.In light of the large size of the cable and considering the excavation works required, there is the potential for a pollution event at these watercourse crossings to be caused by either in-stream trenching releasing sediments or sediment laden run-off. All the waterbodies in Table 3.1 flow into Rye Water which subsequently flows through Rye Water Valley SAC. At the location of HDD launch and reception sites the sediment is also likely to contain oils and chemicals from the drilling rig at Rye Water, WB13. There is potential for bentonite/drilling fluid breakout from the HDD drilling process to contaminate Rye Water at WB13.

The following three attributes of petrifying springs are considered to relate directly to water quality, which in the absence of mitigation, have potential for adverse effects on this QI. Source pollution to surface and ground waters is listed as a 'high' pressure and a 'high' threat, see Table 5.1 and NPWS (2019b).

- Pollution of surface water is considered to have the potential to alter the spring's distribution as petrifying springs depend on permanent irrigation from upwelling groundwater from natural processes. A pollution event would not be a 'natural process' and would temporarily affect its water availability through sediments potentially blocking or altering flow ground water flows.

- Pollution of surface water is considered to have the potential to alter the vegetation composition because the plants at the petrifying springs are highly specialised and therefore sensitive to water pollution.

- Pollution of surface water is considered to have the potential to cause a decline in distribution or population size of distinct flora and fauna due to its sensitivity to water quality.

5.1.4.2 Narrow-mouthed whorl snail

Potential impact – potential for pollution event at watercourse crossings

For the same reasons as petrifying springs in Section 5.1.4.1, where a watercourse connects to the Rye Water (Table 3.1), in the absence of mitigation there is potential for pollutants (e.g., oil and fuel spillage, drilling fluid) to be subsequently transported to Rye Water Valley/Carton SAC since Rye Water flows through it.

Narrow-mouthed whorl snail was last recorded at Rye Water Valley/Carton SAC in 1997. Using the precautionary principle, this snail is assumed to be present within the same 1km as it was last recorded. The following three attributes of narrow-mouthed whorl snail i.e., distribution, occurrence in suitable habitat, and habitat area relate directly to water quality and are considered, in the absence of mitigation, to potentially be subject to adverse effects as a result of the Proposed Development. Pollution is not included as a pressure or threat to this species in NWPS's species assessment (2019c), although this species is an indicator of local distinctiveness for which one the conservation objective attributes is 'no decline in distribution or population size of rare threatened or scarce species associated with the habitat AND to maintain features of local distinctiveness, subject to natural processes' (NPWS, 2021).

- Pollution of surface water is considered to have the potential to alter distribution of this species because it feeds on bacterial films and decaying vegetation in moss, leaves, and decaying vegetation. Pollution of these food sources by surface water could affect the snail's ability to feed.

- Pollution of surface water is considered to have the potential to affect the occurrence of this species because the snail's food supply could become contaminated and inedible, thus causing the snail to starve.

- Pollution of surface water is considered to have the potential to affect the habitat area suitable for this species by contaminating the area supporting it.

5.1.4.3 Desmoulin's whorl snail

Potential impact – potential for pollution event at watercourse crossings

For the same reasons as presented for petrifying springs in Section 5.1.4.1, where a watercourse connects to the Rye Water (Table 3.1), in the absence of mitigation there is potential for pollutants (e.g., oil and fuel spillage, drilling fluid) to be transported to the SAC since Rye Water flows through it.

Four attributes of Desmoulin's whorl snail i.e., distribution, occurrence in suitable habitat, density within habitat and habitat area are considered to relate directly to water quality and are considered, in the absence of mitigation, to have potential to have adverse effects on this QI. Pollution is not included as a pressure or threat to this species in NWPS's species assessment (2019c), although this species is an indicator of local distinctiveness for which one the conservation objective attributes is 'no decline in distribution or population size of rare threatened or scarce species associated with the habitat AND to maintain features of local distinctiveness, subject to natural processes' (NPWS, 2021).

- Pollution of surface water is considered to have the potential to alter distribution of this species because it feeds on bacterial films and decaying vegetation in moss, leaves, and decaying vegetation. Pollution of these food sources by surface water could affect the snail's ability to feed.

- Pollution of surface water is considered to have the potential to affect the occurrence of this species because the snail's food supply could become contaminated and inedible, thus potentially causing the snail to starve.

- Pollution of surface water is considered to have the potential to affect the density of the species within the habitat by contaminating the area supporting it and affecting its ability to feed and breed.

Potential impact –summary of potential for pollution event

Details of the two methods used for watercourse crossings are given in Section 1.2.3.4. In light of the large scale size of the cable crossing and considering the excavation works required, there is potential for a pollution event at these watercourse crossings to be caused by either in-stream trenching releasing sediments or sediment laden run-off. For the same reasons as for petrifying springs, narrow-mouthed whorl snail, and Desmoulin's whorl snail, where a watercourse connects to Rye Water (Table 3.1), in the absence of mitigation there is potential for pollutants (e.g., oil and fuel spillage, drilling fluid) to be transported to the SAC since Rye Water flows through it.

6. Mitigation Measures

6.1 Ecological Clerk of Works

The EcoW will be a member of a professional body such as CIEEM or similar. The on-site Ecological Clerk of Works (EcoW)[5] will be be appointed by the Contractor to carry out pre-construction surveys to ensure that the baseline is current and, where required will implement appropriate mitigation measures as needed. Where sensitive habitats or species have the potential to be impacted, the EcoW will be on site to oversee the implementation of all mitigation measures as described below.

The EcoW will be at sensitive locations for example where there will be in-stream works and at locations where there is potential for disturbance to QI species and where silt fencing will be installed, and in areas of vegetation reinstatement, including tree planting and the locations of which are to be determined. Table 6.1 shows the indicative location of proposed silt fencing locations. To note, some of these locations are yet to be determined by the EcoW, as part of the CEMP, who will also be responsible for delivering a toolbox talk.

The EcoW will give toolbox talk to all site personnel to highlight any environmental sensitivities and the boundaries of sensitive habitats. Toolbox talks will include findings of pre-construction surveys on baseline changes and any adaptive mitigation measures required. The EcoW will propose adaptive mitigation measures in response to, for instance, extreme weather events (amber and red Met Éireann weather warnings), or mitigation requirements arising from pre-construction surveys which identify unexpected receptors. Method statements in relation to trenched crossings prepared prior to the start of works and will be in accordance with particular IFI standards unless otherwise agreed with the IFI or planning authority. No sensitive works will be permitted without the prior approval of the EcoW.

Table 6.1: Proposed indicative silt fencing locations where an Ecological Clerk of Work will be required.

Waterbody name	Indicative Location of silt fencing (NGR)	European Site with Hydrological Connection
Rye Water_030	1 location: • N 93930 45180	Rye Water Valley/Carton SAC
Jenkinstown stream_010	4 locations: • N 91730 45313 • N 90246 45483 • N 89775 43468 • N 89661 43153	Rye Water Valley/Carton SAC
Unassigned stream	1 location: • N 89419 43023	Rye Water Valley/Carton SAC
Rye Water_020	2 locations: • N 89243 42178 • N 88410 40767	Rye Water Valley/Carton SAC
Rye Water_010	1 location: • N 88065 40613	Rye Water Valley/Carton SAC
Royal Canal	1 location: • N 87874 40210	Rye Water Valley/Carton SAC

6.2 Pollution Control

Potential pollution impacts from construction are via the following pathways: transport of pollutants into Rye Water Valley/Carton SAC from watercourses crossed by the Proposed Development either by in-stream trenching or HDD. Considering the potential for effects resulting from pollution and sediment laden run-off, control measures have been developed to ensure that the activities do not adversely impact upon the surface water

[5] An Environmental Clerk of Works (EnCoW) with sufficient experience and membership of a professional body may also be used.

environment. Measures to mitigate pollutants entering the watercourse during construction of the Proposed Development, and potentially affecting the QI of the site, are outlined below.

The mitigation measures set out herein will be implemented to ensure that there will be no pollution of surface water during the undertaking of the Proposed Development. The measures will be incorporated into the contractor's Construction Environmental Management Plan (CEMP) and the CEMP. These mitigation measures have been developed in accordance with the following guidance documents:

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters-Williams *et al.*, 2001);
- CIRIA C648 Control of Water Pollution from Linear Construction Projects: Technical Guide (Murnane *et al.*, 2006a);
- CIRIA C649 Control of Water Pollution from Linear Construction Projects: Site Guide (Murnane *et al.*, 2006b);
- CIRIA C741: Environmental Good Practice on Site (Charles and Edwards, 2015);
- Guidelines for the Crossing of Watercourses during the Construction of National Road schemes (NRA, 2005); and
- S.I. No. 113/2022, (European Union (Good Agricultural Practice for Protection of Waters) (Amendment) Regulations).

6.2.1 Mitigation for Horizontal Directional Drilling (HDD) and Open cut trenching

6.2.1.1 Horizontal Directional Drilling

The launch and reception pits for the drilling rig require the temporary installation of a level hardstanding area on a geotextile base. A pilot hole will be drilled from one side of the crossing to the other side while supporting the bored hole with bentonite. The drill bit will be oriented by the surveyor, and the driller will push the drill string into the ground to maintain the bore path. A steering system will be used by the surveyor to navigate the bores.

The drilled cuttings will then be flushed back by the drill fluid flowing via nozzles in the drill bit, to the surface, where they will be separated from the fluid fraction for disposal. A comprehensive closed-loop drilling fluid mixing and circulation system with recycling capability will be utilised to minimise the volume of fluids required on site. As there is potential for bentonite break out to contaminate Rye Water (WB13), mitigation for this will be implemented. This mitigation is described in Section 6.2.3 below).

6.2.1.2 Open-cut trenches at watercourse crossings

Open cut water crossings, in-stream trenching, have the potential to generate silt and suspended solids. To reduce the risk of discharging sediment into the watercourse, all these works will be carried out in a dry works area.

The dry works area will be isolated by installing an impermeable barrier between the watercourse and the works area. The impermeable barrier will be tailored to the watercourse in question. Techniques that will be employed include the use of inflatable dams, frame dams or, in smaller watercourses, sandbags (double-bagged and underfilled; containing only clean washed sand). Technique used will be dependent on the watercourse to be crossed.

Water pumped from the dry works area will be treated using settlement tanks to remove sediment prior and allowed to filter back to the watercourse, rather than discharging directly back into the watercourse, thereby avoiding scouring. In consultation with Inland Fisheries Ireland (IFI), greater filtration of silt will be achieved prior to discharge, through proposed use of silt de-watering bags which trap silt and expel only clean water and will be left to biodegrade on riverbanks as a habitat enhancement measure.

Water will be conveyed over the isolated section of channel by pumping or the use of a temporary diversion.

The existence of a temporary impermeable barrier within the channel, will have a direct impact on the cross section of the channel and is expected to give rise to localised changes in water depth, velocities, and sediment erosion / deposition.

As with all construction works proposed, no works on watercourses will be allowed to commence until the relevant Risk Assessment Method Statements (RAMS) and pertinent Health and Safety documents are received from the Contractor and are reviewed and agreed by the Client's Representative. These Contractor documents will include method statements, open trenching risk assessments and environmental management plans specific to the area where the trenching is to take place. These plans will be submitted by the Contractor to the Client's Representative on site for review and comment prior to commencing open trench operations. Relevant documentation relating to the proposed works will also be provided to Inland Fisheries Ireland for approval.

All open trench watercourse crossings in salmonid watercourses will take place during the July to September period in order to avoid the period of salmon and trout spawning.

The ground preparation works (such as soil stripping, hardstand formation) adjacent to the watercourse crossing will be carried out in the same manner as that for other works activities. All clean coarse surface material (gravel, cobbles and boulders) on the riverbed or stream will be removed to a depth of 20cm. A thinner layer will be removed if deeper material is mainly clay or sand. These excavated materials will be set back from the watercourse and placed on a geotextile base for use in the reinstatement process following the cable installation.

Where possible, temporary diversions of the watercourse will be the preferred method used for open trenching activities. Should sites be flumed, the diameter chosen for the flume pipe will accommodate flows at the time with spare capacity to cover that predicted over the period that the works would be expected to last. A clay material will be used around the flume pipe to create a seal. Over-pumping methods will be restricted unless otherwise agreed with Inland Fisheries Ireland. If over pumping methods are to be used for open trenching, sandbags will be used with an impermeable barrier. This method requires pumping of water from the upstream end of the barrier to an area downstream of the works area, maintaining normal flow in the watercourse either side of the isolated reach.

Material excavated from the watercourse (and an upstream pump sump if required) will be placed on terram on level ground as far back from the watercourse edge as is practicable and surrounded on its downslope side by a silt fence to prevent material re-entering the watercourse. This material, if deemed suitable, can be used to partially backfill the trench. However, a significant amount will be in excess and will be removed from site under licence. Dewatering of the excavation will be treated on site using settlement tanks before the settled water is returned to the watercourse. A second tank in series with the first will be used if the first is not sufficient to remove enough solids. Pumped over water will be directed to a splash plate to prevent erosion of the riverbed at the downstream side.

The surface coarse substrate which was set aside will be used to reinstate the stream bed after the ducts have been installed and the flume pipe has been removed as well as all the damming materials. All surfaces will be reinstated to the satisfaction of the landowner and re-seeded to assist soil stabilisation. A silt fence will be placed along the riverbank where the works were undertaken in order to prevent solids washed off the works area during heavy rainfall from entering the stream while the surface adequately re-vegetates.

Where in-stream trenching is proposed, site restoration works will be carried out following completion of the crossing, in agreement with IFI. These works will include riverbank stabilisation, gravel replacements etc. In all cases, the site will be restored post installation.

In-stream trenching works will not be carried out during extreme rainfall or high flow events. Met Éireann provides a 5-day weather forecast via its website (www.met.ie) and works will not take place during yellow, orange and red weather warnings. This can be in consultation with IFI.

Unless otherwise agreed with IFI, any element of the works requiring in-stream trenching works will be restricted to the fisheries open season (i.e. restricted to July to September inclusive).

6.2.2 Mitigation for working adjacent to watercourses

Mitigation measures with respect to works taking place within 30m of the Rye Water_030, Jenkinstown stream_010, RyeWater_020, Rye Water_010, Royal Canal rivers and drainage ditches which hydrologically link to these rivers are focused on preventing pollution from surface run-off of the river during excavation and maintaining normal flow levels.

The following measures will be implemented on site, to prevent surface water run-off into rivers:

- Silt fences will be installed between works areas and water features where construction is within 30m of a watercourse or drainage ditch which is linked to a watercourse to prevent potentially contaminated surface water run-off from works areas reaching the surface water feature.
- Silt fences will be installed downgradient of the potential source of the silt/ sediment;
- The silt fence will contain the area where silted waters are being generated and will terminate on high ground, along roads the silt fence will be installed adjacent to drainage ditches;
- The silt fence will be constructed using permeable filter fabric (Hy-Tex Terrastop silt fence or similar) rather than a mesh material;
- The vegetated turves will be peeled back and not detached from the ground, the materials inserted and the turves replaced to hold the base in place;
- The silt fence will be inspected regularly by the EcoW and contractor during the working day and weekly during construction, and in particular following heavy rainfall;
- Silt fences will remain in-situ until the vegetation on the disturbed ground is re-established;
- The silt fence will not be pulled from the ground, but cut at ground level and the stakes/ posts removed;
- Should water build up behind the fences, the sediment will settle to the bottom. Water can be released, but sediments will remain and will be removed off site;
- Two lines of silt fencing will be installed in sensitive areas as agreed with the EcoW; and
- A record of the silt fence installation, inspection and removal must be maintained by the EcoW.

6.2.3 Mitigation for accidental pollution

Mitigation measures with respect to accidental pollution are focused on prevention and safeguarding the approach to the storage and handling of materials and managing vehicles during the temporary construction phase.

The following measures will be implemented on site for the storage of materials:

- All oil and diesel storage facilities will be at least 30 m from any watercourse including surface water drains unless prior approval is confirmed by EcoW to reduce this distance;
- Spill kits and drip trays will be provided for all equipment and at locations where any liquids are stored and dispensed;
- Storage areas for solid materials, including waste soils, will be designed and managed to prevent deterioration of the materials and their escape (via surface run off or wind blow);
- Storage areas will be kept secure to prevent acts of vandalism that could result in leaks or spills; and
- All containers of any size will be correctly labelled indicating their contents and any hazard warning signs.

The following measures will be implemented on site for the prevention of spills:

- Fuel tanks, drums and mobile bowsers (and any other equipment that contains oil and other fuels) will have a secondary containment, for example, double skinned tanks. All tanks, drums and mobile bowsers will be located in a sealed impervious bund with sufficient capacity to contain at least 25% of the total volume of the containers or 110% of the largest container, whichever is the greatest;

- Any discharges from temporary welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licensed contractor to an approved licensed facility, located in the wider area;
- Storage areas will be covered, wherever possible, to prevent rainwater filling the bunded areas. Long-term storage areas will be covered. Storage areas used for a short period of time e.g. a few hours and where no rain is predicted, will not be covered;
    - Fuel fill pipes will not extend beyond the bund wall and will have a lockable cap secured with a chain.
- Where fuel is delivered through a pipe permanently attached to a tank or bowser:
    - Any pipe will be fitted with a manually operated pump or a valve at the delivery end which closes automatically when not in use;
    - Any pump or valve will be fitted with a lock;
    - Any pipe will be fitted with a lockable valve at the end where it leaves the tank or bowser;
    - Any pipework will pass over and not through bund walls; tanks and bunds will be protected from vehicle impact damage;
    - Tanks will be labelled with contents and capacity information;
    - All valves, pumps and trigger guns will be turned off and locked when not in use. All caps on fill pipes will be locked when not in use.
- Suitable precautions will be taken to prevent spillages from equipment containing small quantities of hazardous substances (for example, chainsaws and jerry cans) including:
    - Each container or piece of equipment will be stored in its own drip tray made of a material suitable for the substance being handled; and
    - Containers and equipment will be stored on a firm, level surface.
- For deliveries and dispensing activities, it will be ensured that:
    - Site-specific procedures are in place for bulk deliveries;
    - Delivery points and vehicle routes are clearly marked; and
    - Emergency procedures are displayed, and a suitably sized spill kit is available at all delivery points, and staff are trained in these procedures and the use of spill kits.
- The following measures will be implemented to reduce the risk of fuel and oil leaks from vehicles and plant:
    - Vehicles and plant provided for use on the site will be in good working order to ensure optimum fuel efficiency, and are free from leaks;
    - All machinery will be fully compliant with the relevant standards and requirements to reduce the potential for leaks;
    - Sufficient spill kits will be carried on all vehicles;
    - Vehicles and plant will be regularly maintained in line with the Contractors auditable inspection schedule to ensure that they are working at optimum efficiency and are promptly repaired when not in good working order;
    - Vehicles and plant will not park near or over drains and will be washed in accordance with the commitments set out above; and
    - Refuelling of vehicles and plant will be carried out on hard standing, using drip trays to ensure no fuel can contaminate the ground outside of the bunded areas.

The following measures will be implemented to reduce the risks associated with drilling fluid release:

- An Emergency Incident Response Plan will be developed in consultation with IFI. This will be provided to effectively address inadvertent releases of sediment through frac-outs, or other releases of sediment laden water from the project site. The Plan will include:
    - clearly outlined steps that the contractor is to take in the event of a sediment release or other type of spill.
    - clearly outlined steps involved to mitigate an inadvertent return or frac out after it occurs and will not rely solely on the contractor to take all necessary steps to minimize the impacts.
    - Contingency Plans will include the provision of a vacuum truck, or alternative means of containing or cleaning up a sediment release, at the time of construction in sensitive areas. If vacuum trucks are to be utilized, they should be on-site during construction, and be ready to contain any spill, as it occurs, before it enters a surface water feature. If a sediment spill occurs within the watercourse, adequate isolation of the release will be provided to contain the sediment, and the vacuum truck be ready to remove the drilling fluid and any other frac out soil.
        - additional measures will include having a supply of products that can be used to stop a frac-out, such as 'Poly Swell', or equivalent. This product can be mixed into both water and filling mud to seal or fill fractures.
        - ensurance that all products used on site are to be environmentally safe.
        - Consideration of frac mitigation wells to relieve drilling pressures.
        - The Contingency Plan will indicate if, and when, HDD activities are to resume;
- When using HDD, the drilled cuttings will then be flushed back by the drill fluid flowing via nozzles in the drill bit, to the surface, where they will be separated from the fluid fraction for disposal. A comprehensive closed-loop drilling fluid mixing and circulation system with recycling capability will be utilised to minimise the volume of fluids required on site;
- The shaft and borehole will be kept a minimum of 50m away from any watercourse where possible. However, given that the shaft will be kept as short as possible to reduce the risk of the drilling machine becoming stuck, it may not be possible to keep 50m from a watercourse. In this case a bunded area will be created around the temporary working space to prevent slurry washing into the SAC in the case of accidental release;
- Breakout will be mitigated through management of pressures;
- Use will be constantly monitored by the contractor through materials balance calculations, pressure monitoring in the lines and above ground visual assessment of the works. The pressure will be lowered, if necessary, to prevent a breakout. Any sudden drop in pressure which could indicate a bentonite breakout will result in immediate cessation of bentonite pumping;
- Appropriate drilling mud formulation and management for the conditions and appropriate drilling practices will be adhered to by the contractor at all times; and
- The contractor will prepare an emergency action plan (in-line with the measures presented in the CEMP for the Proposed Development) which will include containment, control and clean-up measures in the event of drilling fluid release into the environment. Containment measures include the installation of interception devices (e.g., silt fence, staked straw bales, sediment curtains, collection sumps). Specifically:
    - When using HDD, the drilled cuttings will be flushed back by the drill fluid flowing via nozzles in the drill bit, to the surface, where they will be separated from the fluid fraction for disposal. A comprehensive closed-loop drilling fluid mixing and circulation system with recycling capability will be used to minimise the volume of fluids required on site;
    - The shaft and borehole will be kept at least 50 m away from any watercourse where possible. However, given that the shaft will be kept as short as possible to reduce the risk of the drilling machine becoming stuck, it may not be possible to keep 50 m from a watercourse. In this case, a bunded area will be created around the temporary working space to prevent slurry washing into the designated site in the case of accidental release; and

    - Use will be constantly monitored by the contractor through materials balance calculations, pressure monitoring in the lines and above ground visual assessment of the works. The pressure will be lowered, if necessary, to prevent a breakout. Bentonite pumping will stop immediately if any sudden drop in pressure is detected which could indicate a bentonite breakout;
    - Biodegradable drilling mud formulation and management for the conditions and best practice drilling practices will be adhered to by the contractor at all times.

The following methods will be implemented to maintain fish passage when dry cutting waterbodies:

- Map fish habitat prior to works;
- Remove fish prior to dewatering;
- Secure bunded area preventing fish entering works area;
- Use silt fencing and over pumping;
- Facilitate fish passage by using two flumes;
- Retain vegetation up and downstream of works;
- Use a temporary access bridge across river to prevent workers walking across riverbed;
- Define the works area; and
- Compact bare earth to reduce run-off.

If silt laden run off is formed on site, the following measures will be implemented to prevent silt laden surface water flowing into surface water receptors:

- Silt fences will be installed between works areas and water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water feature.
- Silt fences will be installed downgradient of the potential source of the silt/ sediment;
- The silt curtain will contain the area where silted waters are being generated and shall terminate on high ground;
- The silt fences will be constructed using permeable filter fabric (Hy-Tex Terrastop silt fence or similar) rather than a mesh material;
- The vegetated turves will be peeled back and not detached from the ground, the materials inserted and the turves replaced to hold the base in place;
- The silt fence will be inspected regularly by the ECoW and contractor during the working day and weekly during construction, and in particular following heavy rainfall;
- Silt fences will remain in-situ until the vegetation on the disturbed ground is re-established;
- The fence will not be pulled from the ground, but cut at ground level and the stakes/ posts removed;
- Should water build up behind the fences, the sediment will settle to the bottom. Water can be released, but sediments will remain and will be removed off site;
- Two lines of silt fencing will be installed in sensitive areas. This will follow a judgement call by the ECoW; and
- A record of the silt fence's installation, inspection and removal must be maintained by the ECoW

The following measures will be implemented to reduce risks associated with concrete pouring:

- The works method statement will include details on monitoring requirements for instream concrete pouring works, handheld turbidity monitoring for instream works;
    - Prior to the concrete pour taking place, all mitigation for turbidity and erosion control will be checked to ensures it is fit for purpose;

    - Established concrete washout management areas will be designated to control the discharge of concrete washout;
    - An emergency response plan will be developed and communicated to site staff prior to the concrete pour being undertaken;
    - The EnCoW and on site personnel will monitor the concrete pour continuously, ensuring that any spills are promptly addressed and mitigated; and
    - The ECoW will conduct a thorough inspection of the site after the concrete pour to identify any environmental impacts and implement clean-up measures if necessary.
- A suitable risk assessment for wet concreting will be completed prior to works being carried out and this will detail measures to prevent discharge of alkaline waste waters or contaminated storm water to the underlying subsoil.
- When working in or near the surface water and the use of introduced materials (e.g. oil) cannot be avoided, the use of alternative materials such as biodegradable oils shall be used.
- Placing of concrete in or near watercourses will be carried out only under the supervision of the Ecological Clerk of Works (ECoW)
- There will be no hosing of concrete, cement, grout or similar material spills into surface water drains. Such spills shall be contained immediately, and runoff prevented from entering the watercourse;
- Concrete waste and wash-down water will be contained and managed on-site as detailed in the works method statement to prevent pollution of all surface watercourses; and
- Washout from concrete lorries will not be permitted on-site and will only take place at the batching plant (or other appropriate facility designated by the manufacturer).
- Construction vehicles will be sent back to the construction compound for wash down in accordance with CIRIA C648 recommendations.
- Silt fencing will be installed along watercourses adjacent where works are proposed. Double silt fences will be installed in areas where concrete pouring is required. This includes areas where concrete pouring is to be undertaken and where there is a risk to European designated sites. The location of the silt fencing is set out in Table 6.1 of this report.

The following measures will be implemented to ensure reinstatement of land and vegetation to protect watercourses:

- Land will be reinstated to its baseline condition, in so far as possible. The reinstatement operation will start with restoration of the subsoil by scarifying / ripping it with flat lift rippers, pulled by a bulldozer to a minimum uniform depth of 300mm, with care taken to prevent damage to field drainage and other services. The depth of ripping will be selected to scarify / loosen any material compacted during construction. In all cases the depth of ripping will exceed the depth of subsoil compaction. All surface stones and roots over 150mm in diameter will be picked up and removed. Re-grading subsoil using excavators / graders will be carried out and will include side slopes, where applicable;
- The spreading of subsoil and later topsoil will be carried out during favourable weather conditions when the soil is drier and more friable. The subsoil stockpiled for reinstatement will be pulled back from the fence line using excavators to allow bulldozers to push it evenly back across the corridor and leaving it generally level. Then the separately stockpiled topsoil will be pulled back from the fence line using excavators to allow bulldozers to push it evenly back across the corridor and leaving it generally level so as to present a neat and level appearance (the level of the trench area shall be the same as that of the undisturbed surrounding ground around one year after restoration is completed); and
- Reseeding will then be carried out on completion of the topsoil spreading, if required. Semi-natural habitats will be left to re-vegetate naturally from the seed bank within re-instated soils. Commercial seed mixes will only be used to re-instate vegetation on agricultural lands (EirGrid 2023). The rate of seeding, time and method of sowing, including the application of fertiliser will be undertaken in agreement with an experienced ecologist and will follow the regulations for the protection of watercourses (S.I. No. 113/2020 – European

Union [Good Agricultural Practice for Protection of Waters] [Amendment] Regulations 2022) and guidance on reseeding (Teagasc, 2014)..

7. In-combination assessment

To take account of in-combination effects, proposals in adopted plans and in finalised draft plans which have been formally published or submitted for consultation or adoption and projects that are completed, approved but not commenced, or proposed (for which an application for approval or consent has been made but not yet approved, including refusals subject to appeal and not yet determined) have been considered in the appropriate assessment (EC, 2002). A search of the National Planning Application Database (NPAD) (DoHLGH, conducted in March and July 2022, in December 2023 and February 2024) within 1 km (which is considered a precautionary and proportionate distance for ZoI of direct impact) of the Proposed Development in the last three years (the three year period would cover any projects likely still in their construction phase that could overlap with the Proposed Development construction programmed) has been undertaken to identify other projects that may result in cumulative impacts. The search was up to date at the time of submission of the NIS. The majority of recent planning applications in the vicinity of the Proposed Development are small scale domestic and commercial applications, whose codes and date of submission are shown below.

The planning applications that have been proposed or granted permission within 1km, the majority of recent planning applications in the vicinity of the Proposed Development are small scale domestic and commercial applications, are presented below in Table 7.1. The following websites were used in the search in addition to the national Planning Application Database.

- An Bord Pleanála: https://www.pleanala.ie/en-ie/home
- Kildare County Council: https://kildarecoco.ie/AllServices/Planning/PlanningApplicationsandPermission/
- Meath County Council: https://www.eplanning.ie/MeathCC/searchtypes

Table 7.1 Plans and developments within 1km of the Proposed Development.

Planning ref.	Planning Authority	Project Description	Comment
N/A	Meath County Council	The Meath County Development Plan 2021-2027 A Natura Impact Report was prepared (Scott Cawley 2021) in support of The Meath County Development Plan 2021-2027. This report assessed potential impacts arising from the Meath County Development Plan 2021-2027 (Meath County Council 2021). No adverse effects were identified on the site integrity after implementation of mitigation on any of the European sites identified within the ZoI or the vicinity of the Proposed Development. As such, no in-combination effects are anticipated between the Proposed Development and the Meath County Development Plan 2021-2027.	Before mitigation there is potential for in-combination effects. However, with mitigation in place from Meath County Development Plan, INF POL 15 improvement in water quality, RUR OBJ 30 development of agriculture while protecting nature waters, RUR POL 25 environmentally sustainable agricultural activities protect watercourses from pollution and RUR OBJ 34 permit development on established agriculture or forestry while protecting watercourses, there is no potential for in-combination effects with the Proposed Development.
N/A	Kildare County Council	Kildare County Development Plan 2017-2023. A Natura Impact Report was prepared (CAAS, 2017) in support of the Kildare County Development Plan 2017-2023. This report assessed potential impacts arising from the Kildare County Development Plan 2017-2023 (Kildare County Council, 2017). The NIS identified that the construction, operation and/or decommissioning of the potential developments identified within the plan have the potential to impact upon Rye Water/Carton SAC. No adverse effects were identified on the site integrity after implementation of mitigation on any of the European sites identified within the ZoI or the vicinity of the Proposed Development. As such, no in-combination effects are anticipated between the Proposed Development and the Kildare County Development Plan 2017-2023.	Before mitigation there is potential for in-combination effects. However, with mitigation in place Kildare County Development Plan specifically in relation to Rye Water Valley/ Carton SAC – Policies: NH 3, NH 4, NH 5, NH 6, NH 7, NH 8, NH 9, NH10, NH 11, NH 12, GI 5, GI 17, GI 18, GI 25, G1 27, WS13 and Objectives: NHO 6, NHO 9, there is no potential for in-combination effects with the Proposed Development.
N/A	Kildare County Council	Kildare County Council Development Plan 2023-2029. A Natura Impact Report was prepared (Arup, 2022) in support of the Kildare County Development Plan 2023-2029. This report assessed potential impacts arising from the Kildare County Development Plan 2023-2029. The	Before mitigation there is potential for in-combination effects. However, with mitigation in place Kildare County Development Plan 2023-2029 as specifically detailed in Table 7 of the NIS. However, with mitigation in place from Kildare

Planning ref.	Planning Authority	Project Description	Comment
		EirGrid Transmission Development Plan 2020-2029 was included in the assessment.	County Development Plan 2023-2029, there is no potential for in-combination effects.
N/A	EirGrid Grid Implementation Plan 2017-2022 and Draft Grid Implementation Plan 2023-2028	The policies, objectives and projects within EirGrid's Grid Implementation Plan were screened for their potential to have Likely Significant Effects (LSEs) on European sites and five projects identified with the potential for LSE. These were assessed in the NIS for the plan. No adverse impacts were identified on site integrity after implementation of mitigation on any of the European sites identified within the ZoI of the Proposed Development. Potential for in-combination effects are possible between the Proposed Development and Grid Implementation Plan 2017-2022 and Draft Grid Implementation Plan 2023-2028.	Before mitigation there is potential for in-combination effects. However, with mitigation in place from EirGrid's Grid Implementation Plan, as set out in detail in Chapter 7 'Mitigation and Avoidance' there is no potential for in-combination effects between Implementation Plan(s) and the Proposed Development.
201143	Kildare County Council	Conditional permission granted for a proposed extension to a Distribution Centre of height 19 m to comprise of a: warehouse extension, main office extension over two storeys; dispatch and extension goods-in office over two storeys; new one storey transport office; and vehicle maintenance unit extension. The gross floor area of the premises will increase from 29,106 m^2 to 41,891 m^2, an increase of 12,785 m^2. Some demolition will be required. Additional new vehicle parking areas will be provided including a new HGV parking area located to the east of the Distribution Centre and a new additional car parking area to the south of the Distribution Centre, on the south side of the R148. Provision of 172 no. car parking spaces; 175 no. HGV trailer parking spaces; 27 no. tractor (HGV cab) parking spaces; and 128 no. bicycle parking spaces and associated infrastructure. The development will involve minor alterations to the existing entrance at R148 which will provide vehicular, pedestrian and cyclist access and egress to the Distribution Centre. An additional new vehicular, pedestrian and cyclist access and egress will be provided off R148 to a new car parking area to the south of the main Distribution Centre site. A pedestrian crossing over this road will be provided connecting the southern car park to the main site. The associated site and infrastructural works include provision for all landscaping works; boundary treatment; internal roads and footpaths; PV panels and	This project is approximately 7.2m from Rye Water and 60.2m from Royal canal, which have hydrologically link to the Rye Water Valley/Carton SAC. However, with mitigation in place from project and Proposed Development there is no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
		electrical services. The Proposed Development will involve modifications to a previous permission – Planning Register Reference 02/1561. Overlaps the proposed cable route Planning Application Boundary. Permission is granted.	
20840/ 310016	Kildare County Council/APB	Boran Plastic Packaging Ltd. Construction of a 5,627 square metre Specialist Packaging Single Storey High Level Manufacturing Facility with Three Storey Head office incorporating, administration, sales, design, research and development departments, staff changing room, staff canteen, car parking, bicycle parking, ESB sub station, two storey services plant room, loading bay, entrance gates, pedestrian gate, building signage, landscaping, extension to existing estate service road and all associated siteworks on a site of 2.5672 hectares. The project lies adjacent to the Planning Application Boundary at Oldtown Demesne, Nass where the Proposed Development follows Millennium Parkway. The project was granted planning permission in July 2020. Project permission is granted, timeline for other development unknown. Within the proposed cable route Planning Application Boundary. Proposed Development passes the frontage of the development along the Millenium Parkway. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	Osberstown Pond, approximately 210m west of the projects does not support SCI wintering birds and there are no watercourses that link it to Rye Water/Carton SAC. There is potential for the construction phase of the Boran Plastic project to overlap with the Proposed Development. However, there are no pathways to Rye Water Valley Carton SAC to be impacted by the project because there are no pathways that connect them. No potential for in-combination effects.
N/A **Exempted Development**	N/A Exempted Development	EirGrid CP0869 Maynooth – Woodland 220Kv Line Uprate. Overlaps with the Proposed Development at Woodland Substation Planning Application Boundary. Construction timeline unknown but due to be energized by Q4 2024	No potential for in-combination effects. Considering the nature, scale and location of this development, there is no potential for Operational Phase to result in in-combination effects with the Proposed Development.

Planning ref.	Planning Authority	Project Description	Comment
PCI0001	An Bord Pleanála (ABP)	EirGrid CP0466 North South Interconnector This project involves a second, higher-capacity interconnector being added, to connect the electricity grids of Ireland and Northern Ireland. It will connect to the network in Northern Ireland in Co Tyrone, cross the border between Armagh and Monaghan, and then join the network in Ireland at an existing substation in County Meath. Planning application is granted. Overlaps with the Proposed Development at Woodland Substation Planning Application Boundary.	No potential for in-combination effects. Timelines are unknown but there is potential for Construction Phases to overlap. No in-combination effects are likely on the Rye Water /Carton SAC from the Interconnector Project as there is no hydrological linkage to the SAC.
2360296	Meath County Council (MCC)	EirGrid CP1235 Louth – Woodland 220 Kv Uprate. Proposed uprate of the existing Louth – Woodland 220 kV overhead powerline (OHL) between the existing Louth 220 kV substation in the townland of Monavallet, County Louth and the existing Woodland 220 kV substation in the townland of Woodland, County Meath. This project overlaps with the Proposed Development at Woodland Substation Planning Application Boundary Planning permission is granted. Timeline for other development unknown.	No potential for in-combination effects. Considering the nature, scale and location of this project (i.e., uprating an existing overhead line), there is no potential for in-combination effects to occur.
22837/ 23136	Meath County Council	GDA Energy 4 Ltd Proposed development constitutes a new battery energy storage facility & synchronous condenser, with associated change of use on lands currently in agricultural use. The proposed development will comprise of	No potential for in-combination effects. Timeline unknown but construction is estimated to take 10 years. Potential for Construction Phases to overlap. Considering the nature, scale and location

Planning ref.	Planning Authority	Project Description	Comment
		rechargeable battery units with grid forming inverters contained within 253 no. 40 foot containers on site at Woodland, County Meath. The project is 297m from Woodland substation Planning Application Boundary at its nearest location. Planning permission was granted in April 202422.	of this project, there is no potential for in-combination effects from potential pollution impacts. There is no hydrological link to Rye Water Valley/Carton SAC
N/A	Meath County Council/Fingal County Council/APB	EirGrid CP1021 East Meath – North Dublin Grid Upgrade 37.5 kilometres of new 400 Kv underground cables between the existing Woodland Substation in the townland of Woodland, near Batterstown, County Meath and the existing Belcamp Substation in the townland of Belcamp in Fingal, north County Dublin. A new 400Kv Gas Insulated Switchgear Hall and associated transformers will also be required at Belcamp Substation. This project overlaps with the Proposed Development at Woodland Substation and along the 'Woodland Corridor' between Woodland Substation and the R156 Regional Road. Planning application in preparation. Due to be submitted to ABP in Q1 2024. Construction Phase of CP1021 is estimated to commence in Q3 2026 and be completed by Q4 2029.	No potential for In-combination effects. The project does not cross any watercourse that has hydrological connectivity to Rye Water Valley/Carton SAC and therefore there is no potential for in-combination effects.
N/A **Future Planned Project as part of the TDP 2023–- 2032**	N/A	EirGrid CP1214 North County Dublin Bulk Supply Point. Bulk Supply Points are interface points between the Transmission System and Distribution System. Planning status is Future Planned Project as part of the TDP 2023 – 2032. Exact location and detail unknown at this stage of the project.	N/A
N/A	N/A	EirGrid	N/A

Planning ref.	Planning Authority	Project Description	Comment
Future Planned Project as part of the TDP 2023–- 2032		CP1218 West County Dublin Bulk Supply Point. Bulk Supply Points are interface points between the Transmission System and Distribution System. Planning status is Future Planned Project as part of the TDP 2023-2032. Exact location and detail unknown at this stage of the project.	
N/A **Future Planned Project as part of the TDP 2023–- 2032**	N/A	EirGrid CP1273 Dublin Central Bulk Supply Point. Bulk Supply Points are interface points between the Transmission System and Distribution System. Planning status is Future Planned Project as part of the TDP 2023-2032. Exact location and detail unknown at this stage of the other project.	N/A
221550	Meath County Council	EirGrid PLC CP1110 Woodland Station 400–- 220KV Protection Upgrade, not part of the Proposed Development. The project will consist of 1. Installation of outdoor Air Insulated Switchgear (AIS) electrical apparatus, including an associated extension to the hardstand compound (approximately 4 hectares) to facilitate same. This project overlaps with the Proposed Development at Woodland Substation. Planning permission is granted. Construction timeline unknown but due to be energized by Q4 2024.	No potential for in-combination effects. There will not be an overlap in Construction Phases as the Project will be energized in the end of 2024 and the construction phase for the Proposed Development will commence in Quarter 2, 2025.

Planning ref.	Planning Authority	Project Description	Comment
211175	Kildare County Council	EirGrid Proposed project, not part of the Proposed Development, will consist of an extension to the western boundary of the existing Dunnstown 400 KV substation to allow connection of series compensation equipment to the Dunnstown-Moneypoint 400 KV circuit. Planning permission is granted. This project overlaps with the Proposed Development at Dunnstown Substation. Timeline for other development is unknown.	No potential for in-combination effects. There is potential for Construction Phases to overlap. Considering the nature, scale and location of this project, there is potential for in-combination effects from pollution impacts if Construction Phases were to overlap. However, there is no hydrological link to the Rye Water Valley/ Carton SAC therefore no effects pathway and no potential for in-combination effects.
314232	ABP	Transport Infrastructure Ireland (TII) Dart+ West – electrification and re-signaling of Maynooth and M3 Parkway Line, capacity enhancements at Connolly station, new Spencer Dock station, level crossing closures, new Dart depot west of Maynooth etc. This project is 1 km from proposed cable Planning Application Boundary. Lodged for planning. No determination as of yet.	Additional information is required for the exact location. However, the project could be at approximately 500m from Rye Water, which is hydrologically linked to the Rye Water Valley/ Carton SAC, thus before mitigation there is potential for in-combination effects from pollution. However, with mitigation in place from Implementation of the Proposed Development there is no potential for in-combination effects.
313276/22313276	ABP/KCC	The Land Development Agency. Strategic Housing Development, including the demolition of an existing structure on the eastern boundary of the site, construction of 219 no. residential units (42 no. houses, 177 no. apartments), creche and associated site works at John Devoy Road, Naas, County Kildare.	No potential for in-combination effects. There is no hydrological link to Rye Valley/ Carton SAC therefore no effects pathway and no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
		This project is 274m from proposed cable Planning Application Boundary. Project status is granted, but timeline for other development is unknown.	
22314564	Kildare County Council	Strategic Housing Development at this site to south of the R148 and east of the R158 abutting the M4 Junction 8 roundabout, Boycetown, Kilcock, Co. Kildare. Proposed development (30,839 m^2 GFA) will consist of the demolition of a detached, vacant cottage (gfa 69 m^2) and the construction of 272 residential units (149 no. houses, 65 apartments and 58 duplexes), childcare facility and foul pumping station along with associated ancillary works and site works. The 149 no. dwellings consist of: • 40 no. 4 bed 2 storey houses (House Type A1, A2, A3, A4, A5) • 8 no. 4 bed 3 storey houses (House Type E1, E2) • 90 no. 3 bed 2 storey houses (House Type B1, B2, B3, C1, C2) • 11 no. 2 bed 2 storey houses (House Type D1) The proposed apartments and duplexes are provided in 7 no. blocks (Blocks A, B, C, D, E, F, G) ranging in height from 3 to 4 storeys, with the exception of 1 no. Duplex Block (Type N1), which is a 3 storey, end of terrace unit. Block A and Block B contain Rooftop terraces at 4th floor level. The Duplex Blocks (Type J1, Type, J2, Type J3, Type J4, Type K1, Type L1, Type M1, Type N1) are all 3-storey and contain 58 units divided as follows: • 6 no. 1 bed ground floor apartment units (Units L1-A) • 23 no. 2 bed ground floor apartment units (Units J1-A, J2-A, J3-A, J4-A, K1-A, M1-A, N1-A) • 1 no. 2 bed duplex unit (two-storey unit) (Units K1-B) • 25 no. 3 bed duplex units (two-storey units) (Units J1-B, J2-B, J3-B, J4-B, L1-B) • 3 no. 4 bed duplex units (two-storey units) (Units M1-B, N1-B)	An AA screening report carried out by Niamh Ní Bhroin in 2022 for the project found no likely significant effects. However, the project is beside the proposed cable route along the R158 and R148 and is within 380 m of the Royal Canal and 850 m from the Rye Water here is potential for cumulative effects if the Construction Phases run concurrent. With the implementation of mitigation measures for the Proposed Development there is no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
		The 65 apartments are located within Blocks A, B, C and D divided as follows: - • 17 no. 1 bed units (Type F1, Type F2, Type F3, Type F4, Type F5, Type F6) • 37 no. 2 bed units (Type G1, Type G2, Type G3, Type G4, Type G5-A, Type G5-B, Type G6, Type G7, Type G8) • 11 no. 3 bed units (Type H1, Type H2) Block D also contains a childcare facility (gfa.526.2 m^2) and includes a dedicated outdoor play area (c.210 m^2). Ancillary works including 1 no. vehicular entrances off the R148 to the north and 1 no. vehicular entrance off the R158 to the west, a spine road which will link with the permitted spine road on the adjoining lands to the south-east under PL09.306826, internal roads, footpaths, cycle lanes, car parking (465 no. spaces), cycle storage/parking (426 no. spaces), 2 no. bus stops, bin storage, public open space, hard and soft landscaping, natural play area, play equipment, boundary treatments, public lighting, 3 no. substations (14 m^2 each) and controlled pedestrian crossing on the R148. Project overlies the proposed cable Planning Application Boundary. Proposed Development. A new application has been submitted in 2024. Planning permission is granted. .	
2043	Kildare County Council	Project involves the demolition of an existing building on site and recladding the shared gable to match the remaining neighboring building. The construction of a new three story over basement mixed use development consisting of a basement car park and plant room, pharmacy unit, convenience store unit and retail unit at ground floor, 4 No. units of medical consultation suites at first floor and 1 unit of medical consultation suites. Ancillary works include office space at second floor, car-parking, boundary treatments, new site entrances and siteworks. The project overlies the proposed cable Planning Application Boundary. Planning. Planning permission is granted.	No potential for in-combination effects. There is no hydrological link of the project to the Rye Water Valley/ Carton SAC therefore no effects pathway and no potential for in-combination effects with the Proposed Development.

Planning ref.	Planning Authority	Project Description	Comment
22325	Kildare County Council	Project involves the installation of new external steel racking to the existing materials yard (the racking is to be mounted on top of the existing concrete hard standings) and all associated site works. AASR carried out and no potential for significant negative environmental effects were identified. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. There is no hydrological link to Rye Water Valley/ Carton SAC, therefore no effects pathway and no potential for in-combination effects.
21386	Kildare County Council	Project involves (a) Erection of a single story type house; (b) Garage/fuel store for domestic use; (c) Installation of septic tank and percolation area; and (d) Upgrading of existing agricultural entrance to a new recessed vehicular entrance and all associated site works. AASR carried out and no potential for significant negative environmental effects were identified. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. There is no hydrological link to the Rye Water Valley/ Carton SAC therefore no effects pathway and no potential for in-combination effects.
18502	Kildare County Council	Project involves alteration works to an existing bungalow on the grounds of Painestown House (Protected Structure Ref. No. B14-30). The works include the construction of a single and two story extension circa 73 m^2, a detached single story shed and carport, landscaping around the house, new treatment plant, percolation area and all associated ancillary works. Painestown House is also a recorded monument, NIAH No. KD010-034. No works proposed directly affect Painestown House. AASR carried out and no potential for significant negative environmental effects were identified. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. There is no hydrological link to the Rye Water Valley/ Carton SAC therefore no effects pathway and no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
223	Kildare County Council	Project involves alterations and extension to existing dormer style dwelling. The application will include the following: (a) Single storey extensions to the rear and side of the dwelling to provide new living room and utility room. (b) New entrance porch to the front of the dwelling. (c) Alterations to the elevational treatment of the dwelling, along with all associated site development and facilitating works including site landscaping. AASR carried out and no potential for significant negative environmental effects were identified. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. There is no hydrological link to the Rye Water Valley/ Carton SAC therefore no effects pathway and no potential for in-combination effects.
181214	Kildare County Council	Project involves retention permission for 4 no. existing booths (used for drying, shotblasting and painting) and ancillary storage rooms (476.9 m^2 combined), standalone office (21 m^2) along with the change of use of the cottage to office / storage unit (136 m^2). Planning permission is sought to: • Demolish domestic garage (25 m^2). • Construct an extension to the north side of the shot blasting booth in order to contain all dust associated with shotblasting (37 m^2) • Construct a new shed structure to the front of the existing workshop (414 m^2.) in order to protect trailers from the weather during shotblast / repainting process and also, critically, to prevent dust emissions. The shed will have a maximum ridge height of 6.38 m high and will be enclosed on 3 sides with the south elevation open to allow trailers to enter. It includes a new doorway connection to the existing cottage building. • Alter the access arrangements to provide single access to the business and family dwelling and significantly improve sightlines and safety (includes new gates and dwelling). • Create new ordered trailer parking area to the rear of the workshop (significantly smaller area than previous application –	No potential for in-combination effects. There is no hydrological link to the Rye Water Valley/ Carton SAC therefore no effects pathway and no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
		approximately one third the size) including a dedicated turning area. • Provide new lined car parking for staff and visitors (12 spaces) and dedicated HGV parking (12 spaces) • Decommission the existing on-site treatment system and percolation area and provide new high specification on-site foul treatment system at a location to the rear of the site. • Provide new surface water drainage infrastructure. • Provide new landscaping with significant screening planting along the front boundary with family dwelling. • Carry out all associated site works. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	
211814	Kildare County Council	Project involves the construction of an agricultural style building to be used to the storage of vintage cars for hobby purposes and all associated site works. AASR carried out and no potential for significant negative environmental effects were identified. The project is adjacent to the proposed cable Planning Application Boundary. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. There is no hydrological link to the Rye Water Valley/ Carton SAC and therefore no effects pathway and no potential for in-combination effects.
21846	Kildare County Council	Project involves extensions to the rear and side of 123 m^2. Retention of change of use from garage to habitable space of 23 m^2. Retention of removal of block archways to the front elevation and retention of new septic tank and percolation area to existing detached bungalow. AASR carried out and no potential for significant negative environmental effects were identified. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. There is no hydrological link to the Rye Water Valley/ Carton SAC therefore no effects pathway and no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
16636 / 22322	Kildare County Council	The proposed development consists of 60 house type EE, a two storey three bedroom semi-detached house of 121m^2. 88 houses, type FF, a two storey four bedroom semi-detached house of 144m^2. 31 houses, type GG, a two storey four bedroom detached house of 163m^2. 3 houses, type G1, a three storey split level four bedroom detached house of 163m^2. 3 houses, type G1, a three storey split level four bedroom detached house of 204m2. 7 houses, type G2, a two storey four bedroom detached house of 163m2. 1 house type G3, a two storey four bedroom detached house of 163m^2. 3 houses, type G4, a three storey split level four bedroom detached house of 204m^2. 18 houses, type JJ, a three storey four bedroom semi-detached house of 203m2. 8 houses, type HH, a three storey four bedroom semi- detached house of 203m^2. 16 no. house type KK, a two storey three bedroom semi- detached house of 100m^2. 8 houses, type LL, a two storey four bedroom semi-detached house of 119m^2. Single story crèche approximately 560m^2. Along with all associated siteworks. The project is 142m from the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. An AA screening report completed in 2016 for the planning application found no likely significant effects. No updated AA screening was available as part of the most recent application. There is however no hydrological linkage to any Rye Water Valley/ Carton SAC and therefore no effect pathway and no potential for in-combination effects .
307258/ 20307258 and 23931	ABP/Kildare County Council	Randelswood Holdings Limited Strategic Housing Development, including 152 no. apartments, childcare facility and associated site works at the Devoy Quarter, Naas, County Kildare. The Project is 332m from the proposed cable Planning Application Boundary. Planning permission is granted, and construction is under way.	No potential for in-combination effects. An AA screening report carried out by Openfield Ecological Services in 2020 for the planning application found no likely significant effects. There is no hydrological linkage to Rye Water Valley/Carton SAC, therefore no effect pathway and no potential for in-combination effects.
211728	Kildare County Council	Project includes the erection of a two storey office/laboratories building with reception entrance area, staff toilets, shower room with goods-in delivery area and storage on ground floor with managers office and staff canteen facilities and staff toilets on first floor. The installation of new	No potential for in-combination effects. No AA screening report was identified during the planning search. However, due to the scale and

Planning ref.	Planning Authority	Project Description	Comment
		foul sewer and surface water sewer and connection into the existing Millennium Park drainage system and connection into the existing water mains. The addition of 27 surface car parking spaces including 4 E-Car charging points, 20 covered cycle parking spaces, delivery area and turning area on south east elevation and all site drainage/site development works. The project is 96.25m from the proposed cable Planning Application Boundary. Planning permission is granted.	location of the project and no hydrological linkage to Rye Water Valley/Carton SAC there is therefore no effect pathway and no potential for in-combination effects. In any case, with the implementation of mitigation measures for the Proposed Development there is no potential for in-combination effects.
23794	Kildare County Council	Construct a single storey extension on the Eastern and Southern sides of the existing Garage/Workshop building and to construct a new canteen in part of the existing store at mezzanine floor level with a new externally cladded fire escape stairs on the Northern (rear) Elevation in the existing building located on the Northern corner of the site and all associated site works and services. The project overlies the proposed cable Planning Application Boundary. Planning. Planning permission is granted.	Considering the nature, scale and location of this development, there is potential for in-combination effects if Construction Phases were to overlap. This project is approximately 7.2m from Rye Water and 60.2 m from Royal canal, which have hydrologically link to the Rye Water Valley/ Carton SAC. Therefor there is potential for in combination effect between the project and the Proposed Development. Before mitigation there is potential for in-combination effects from pollution. However, with mitigation in place from the project and Proposed Development there is no potential for in-combination effects.
212217	Meath County Council	The application site comprises an area of c. 3.8 hectares, for the construction of a workshop/maintenance building, extension to the outdoor concrete pad to allow for an additional composting area, construction of an extension to the composting building to include one additional in-vessel composting tunnel, and the construction of a roof over the existing biofilter. This will facilitate the increase in intake of waste materials at the facility from 50,000 tonnes to 68,500 tonnes per annum. This application relates to development for the purposes of an activity	Considering the nature, scale and location of this development, there is potential for in-combination effects if Construction Phases were to overlap. This project is approximately 7.1 m from the watercourse WB09, 976 m from Rye Water_020 and 1km from Jenkinstown stream_010, which are all hydrological linked with Rye Water Valley/ Carton SAC. Therefore there is

Planning ref.	Planning Authority	Project Description	Comment
		requiring a licence under the Industrial Emissions Directive. An Environmental Impact Assessment Report (EIAR) will be submitted to the Planning Authority with the application. The project is 561.60 m from the proposed cable Planning Application Boundary. Planning permission is granted.	potential for in-combination effects from pollution between the project and the Proposed Development. Before mitigation there is potential for in-combination effects from pollution. However, with mitigation in place from the project and Proposed Development there is no potential for in-combination effects.
221508	Meath County Council	Development with a total site area of 171.34 ha, to include solar panels mounted on steel support structures, associated cabling and ducting, 47 No. MV Power Stations, 3 No. Client Substations, 3 No. Temporary Construction Compounds, tracks, boundary security fencing and security gates, CCTV, landscaping and ancillary works, with a 40 year operational period. A Natura Impact Statement (NIS) had been submitted to the Planning Authority with the Application. Significant further information/revised plans submitted on this application. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. The project is no hydrologically linked to Rye Water Valley/ Carton SAC and therefore has no potential for in-combination effects with the Proposed Development.
23286	Kildare County Council	Project involves the addition of four floodlighting masts to the existing playing pitch, along with skills wall 28.5 m long and 5 m tall, and the associated development and facilitation works. The project is 60 m from the proposed cable Planning Application Boundary. Planning permission is granted.	Considering the nature, scale and location of this development, there is no potential for in-combination effects if Construction Phases were to overlap. This project is not in the vicinity of any watercourse linked with Rye Water Valley/ Carton SAC. Therefore, there is no potential for in-combination effects.
221197	Kildare County Council	Project includes the sub-division of existing domestic site, the construction of additional rooms and a new vehicle entrance.	Considering the nature, scale and location of this development, and that there is no hydrological connection to Rye Water Valley/Carton SAC there

Planning ref.	Planning Authority	Project Description	Comment
		The project is 390m from the proposed cable Planning Application Boundary. Planning permission is granted.	is no potential for construction effects from pollution if the project and the Proposed Development were constructed concurrently.
23320	Kildare County Council	Project includes the construction of four agricultural polytunnels. The project is 263 m from the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and that there is no hydrological connection to Rye Water Valley/ Carton SAC , there is no potential for construction effects from pollution if the project and the Proposed Development were constructed concurrently.
23627	Kildare County Council	Project includes the construction of a single story accommodation and all associated ancillary site works. The project is 77.90m from the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, there is no potential for in-combination effects impacts if Construction Phases were to overlap and constructed concurrently, since there is no hydrological connection to the Rye Water Valley/ Carton SAC so there is no potential for construction effects from pollution if the project and the Proposed Development were constructed concurrently..
23131	Kildare County Council	Project includes the development comprising a change of use of the existing building from residential to office use ancillary to the Killashee House Hotel. The proposed development also comprises a minor internal alteration. The proposal includes all site services, drainage works and ancillary site development works. There are no works proposed to the existing Protected Structure within the grounds of Killashee House Hotel as part of this planning application.	No potential for in-combination effects. Considering the nature, scale and location of this development, and that there is no hydrological connection to Rye Valley/Carton SAC there is no potential for construction effects from pollution if the project and the Proposed Development were constructed concurrently.

Planning ref.	Planning Authority	Project Description	Comment
		The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	
22633	Kildare County Council	Project includes the development at Bluebell Farmhouse, Kilcullen Rd, Naas, Co. Kildare. The development consists of: works being carried out at Bluebell Farmhouse, Kilcullen Road (a protected structure RPS Ref. NS19-115). The construction of a single storey extension to Bluebell Farmhouse which shall comprise the demolition of an existing, non-original single storey extension to the north east side of Bluebell Farmhouse (34m^2); the construction of a single storey extension (150m^2) on the north east comprising of living/kitchen/dining room; the connection to existing services and all ancillary site works. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap.
23838	Kildare County Council	Project includes the retention of Change of Use of commercial premises to an Education Facility. The project is 45m from the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap.,
2360126	Kildare County Council	Project includes the extension of existing public car park, the relocation of the existing entrance and pedestrian entrance, the reconfiguration of existing car park design, the provision of 7 electric car charging, the provision of public lighting. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap. Rye Water Valley

Planning ref.	Planning Authority	Project Description	Comment
23387	Kildare County Council	Project includes the installation of new 2.4m high fencing with 2.6m high ball stopping net installed on top for a total height of 5m around soccer pitch with pedestrian gates provided at the north-west and north-east corners of the pitch, a larger maintenance gate is to be provided at the east end of the pitch and associated site works. The project is 117 m from the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap.
22713	Kildare County Council	Project includes the construction of a dwelling house with new entrance and the connection to the main sewer, mains water and surface water sewer with all ancillary site works. The project is 122.6m from the proposed cable Planning Application Boundary. Planning permission granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap. ,
22567	Kildare County Council	Project includes the construction of a dwelling house with new entrance and the connection to the main sewer, mains water and surface water sewer with all ancillary site works. The project is 160 m from the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap.
22596	Kildare County Council	Project includes the construction a single storey dwelling, detached garage, connection to mains water, new wastewater treatment system and percolation area, new entrance and all associated site works. The project is 15 m from the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap.

Planning ref.	Planning Authority	Project Description	Comment
22108	Kildare County Council	Project includes the erection of 3 external signs affixed to the façade of the existing building. The project is 70m from the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap..
22841	Kildare County Council	Project includes the demolition of an existing habitable bungalow type dwelling and the construction of a replacement two storey type dwelling on the same footprint in lieu, along with the de-commissioning and the removal of an existing septic tank system and the installation of a new effluent treatment system in lieu. And the construction of a detached domestic garage, and all associated ancillary site works. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC there is no potential for in-combination effects impacts if Construction Phases were to overlap.
22580	Kildare County Council	Project includes the extension and improvement to the existing single storey dwelling, the construction of a detached garage, the installation of a proprietary waste water treatment system with polishing filter, and all ancillary site works. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential for in-combination effects impacts if Construction Phases were to overlap.
211700	Kildare County Council	Project includes the erection of a double-sided ball wall with flood lights, adjacent to the existing Astro Turf pitches. The ball wall will be 5 metres high and 15 metres wide, with a 5m high perimeter fence. There will be four flood light poles including lights, each pole being no more than 13 metres high.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC, there is no potential

Planning ref.	Planning Authority	Project Description	Comment
		The project is 63m from the proposed cable Planning Application Boundary. Planning permission is granted.	for in-combination effects impacts if Construction Phases were to overlap.
221103	Kildare County Council	Project includes the provision of an off-licence sales area as part of an existing shop premises including all associated works. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC site, there is no potential for in-combination effects impacts if Construction Phases were to overlap.
2360067	Kildare County Council	Project includes the construction of a single-storey dwelling, recessed vehicular entrance, detached domestic garage, effluent treatment system and all associated ancillary site works. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/ Carton SAC there is no potential for in-combination effects impacts if Construction Phases were to overlap.
23183	Kildare County Council	Project includes the to renovate, alter and extend existing dwelling and construct a new domestic garage and new wastewater treatment system, and the demolition of a porch. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological connectivity to Rye Water Valley/Carton SAC there is no potential for in-combination effects impacts if Construction Phases were to overlap.
2360216	Kildare County Council	Project includes the extension for a single storey, side to side and rear of two storey detached dwelling together with associated siteworks. The project is adjacent to the proposed cable Planning Application Boundary. Planning permission is granted.	Considering the nature, scale and location of this development, there is potential for in-combination effects impacts if Construction Phases were to overlap. The project is 2 km from

Planning ref.	Planning Authority	Project Description	Comment
			Royal Canal, which has hydrological connectivity to the Rye Water Valley/ Carton SAC. Before mitigation there is potential for in-combination effects from pollution. However, with mitigation in place from project and Proposed Development there is no potential for in-combination effects.
306826/ 20306826, 23759 and 23760	ABP/Kildare County Council	Rycroft Homes Limited Strategic Housing Development, including 345 no. residential units (69 no. duplex units, 182 no. houses and 94 no. apartments), creche and associated site works at Kilcock, County Kildare. Project overlaps with the proposed cable Planning Application Boundary. Planning permission is granted and construction underway.	Considering the nature, scale and location of this development, there is potential for cumulative impacts if Construction Phases were to overlap, S.ct . Construction is in progress and therefore it is not likely that Construction Phases will overlap given that the Proposed Development will commence in Quarter 2, 2025. Therefore, it is unlikely for there to be in-combination effects from pollution given that the project and the Proposed Development.
305701 / 19305701	ABP / KCC	Cairn Homes Properties Limited Strategic Housing Development, including the demolition of 1 no. agricultural building, construction of 314 no. residential units (208 no. houses and 106 no. apartments), childcare facilities and associated site works to the east and west of Devoy Link Road, Naas, County Kildare. Project overlaps with the proposed cable Planning Application Boundary. Planning permission is granted, and project is under construction.	No potential for in-combination effects. Considering the nature, scale and location of this development, there is no potential for in-combination effects of Construction Operational Phase to result in in-combination effects with the Proposed Development.
312817	ABP	Rathasker Homes Limited	No potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
		For the demolition of 2 existing habitable dwellings and the construction of 39 residential houses at Rathasker Road, Naas, County Kildare. Project is 9m from the proposed cable Planning Application Boundary. Planning permission is granted, but timeline for other development unknown.	Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/ Carton SAC there is no potential for in-combination effects if Construction Phases were to overlap.
310841 / 21608	ABP / KCC	Strategic Power Projects Limited Construction of enclosed battery energy storage system compound and all associated site works at Dunnstown, County Kildare. Project is 174 m from Dunstown Substation Planning Application Boundary. Planning permission is granted, but timeline for other development unknown.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/ Carton SAC there is no effect pathway and no potential for in-combination effects.
19784	KCC	Electricity Supply Board Proposed to alter the existing J125 - Blessington 38kV line at Bluebell, Kilcullen Road, Naas and will involve undergrounding sections of the above mentioned overhead 38kV line to facilitate the development of a previously permitted housing development. Project is 21 m from the proposed cable Planning Application Boundary. Planning permission is granted, but timeline for other development unknown	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/ Carton SAC there is no effect pathway and no potential for in-combination effects.
191288	KCC	White Tide Developments Ltd A mixed use development at Corscadden's Hotel and grounds, at Church Street, Kilcock, County Kildare. Provision of 65 residential dwellings, a café and ancillary works in 6 blocks.	Considering the nature, scale and location of this development, there is potential for in-combination effects impacts if Construction Phases were to overlap. This project is approximately 74 m from Royal Canal which is hydrologically linked to the Rye Water Valley/

Planning ref.	Planning Authority	Project Description	Comment
		Project is 775 m from the proposed cable Planning Application Boundary. Planning permission is granted, but timeline for other development unknown	Carton SAC. However, with mitigation in place from project there is no potential for in-combination effects.
191296	KCC	Alexander Georgakis Development on site area of 0.445 ha, located at Church Street and Bridge Street, Kilcock, County Kildare and includes built-to-rent shared accommodation with 9 bedrooms and 39 studio apartments, in 4 blocks. 882m from the proposed cable Planning Application Boundary. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	Considering the nature, scale and location of this development, there is potential for in-combination effects impacts if Construction Phases were to overlap. This project is approximately 49.40 m from Royal Canal which has hydrologically link to the Rye Water Valley/ Carton SAC. However, with mitigation in place from project there is no potential for in-combination effects.
21547	KCC	Quattuor Developments Limited Construction of 20 No. dwellings in a row of 11 No. 3-storey houses, 1 No. single storey house and a 4 storey block of 8 No. apartments on Limerick Road, Naas, County Kildare. 749m from the proposed cable Planning Application Boundary. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/ Carton SAC there is no effect pathway and no potential for in-combination effects.
221016	KCC	Island Stability Services Ltd. Develop a synchronous condenser grid support facility, which will connect to the adjoining ESB Dunnstown Electricity Substation in the townland of Dunnstown, Brannockstown, Naas, Co. Kildare.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/ Carton SAC there is no effect pathway and no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
		Overlaps with the Proposed Development at Dunnstown Substation. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	
22221502/23942	KCC	Westar Homes Limited Large-Scale Residential Development including the construction of 134 No. apartments in three blocks within the townland of Naas West, 'Finlay Park', Naas, County Kildare. 493m from the proposed cable Planning Application Boundary. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/Carton SAC there is no effect pathway and no potential for in-combination effects.
23567	KCC	Delamain Solar Farm Ltd. Solar farm with a total area of circa 246 hectares to consist of solar photovoltaic panels with a surface area of 1,130,000 m^2 on ground mounted frames, 40 no. single storey electrical inverter/transformer stations, 4 no. single storey spare parts containers, 19 no. Ring Main Units, 9 no. weather stations underground electrical ducting and cabling within the development site, private lands and within the L6063, L2032, L6071, R448, L6072, R412, L6074, L6047 and R413 public roads to connect solar farm field parcels, security fencing, CCTV, access tracks, 5 no. stream and drain deck crossings, temporary construction compounds, landscaping and all associated ancillary development and drainage works in County Kildare. 376 m from Dunnstown Substation Planning Application Boundary. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/ Carton SAC there is no effect pathway and no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
21365	KCC	Ken Fennell Construction of a residential development of 66 no. houses (24 no. 3 bedroom and 42 no. 4 bedroom) and all associated site development works including internal roads and open space at Oughteranny Village, Kilcock, County Kildare. 900m from the proposed cable Planning Application Boundary. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	Considering the nature, scale and location of this development, there is potential for in-combination effects impacts if Construction Phases were to overlap. This project is approximately 800 m from Royal Canal, and 88m from a watercourse hydrologically linked to the Royal canal. Royal Canal has hydrologically link to the Rye Water Valley/Carton SAC. Before mitigation there is potential for in-combination effects from pollution. However, with mitigation in place from project there is no potential for in-combination effects.
P82022.01	KCC	Sallins Amenity Lands (Part 8 application) Development of amenity and recreational facilities on 16.8 ha of land adjacent to the Sallins Bypass. The southern lands will consist of a main entrance from the Sallins link road and car parking, pedestrian and cycle entrances, 2 natural grass GAA pitches, 2 natural grass soccer pitches, an All-Weather pitch, Playground, Tennis and Basketball Courts, Teen Play area, Wetland area with associated Boardwalk and Bird Watching Tower, Community & Sports Hall building, Restoration of the old stone farm buildings. The northern portion of land will consist of an entrance off the Sallins Link Road with associated overflow car parking area, a path network, enhancement of the existing attenuation area, enlargement of the existing wetland area, platform area with access for canoes to the river Liffey. There will also be associated planting and landscaping with the features and works proposed. Directly adjacent to the proposed cable route. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/ Carton SAC there is no effect pathway and no potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
18303023	KCC	Ardstone Homes Ltd. Strategic Housing Development including 125 no. new residential units comprising of houses and a four storey apartment block, 251 car parking spaces and all ancillary works at Kilcullen Road, Naas, County Kildare. 169m from the proposed cable route Planning Application Boundary. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye Water Valley/ Carton SAC there is no effect pathway and no potential for in-combination effects.
N/A	N/A	MCC R156 Jenkinstown Road Improvement Scheme. Road safety scheme for Mullagh Cross and Environs. Within proposed cable planning application boundary. Options Selection Stage. There is no preferred design progressed at this stage and no known timeline for the development to complete an assessment at this stage.	There is no available information of the projects. However there is the possibility that the project will be in the vicinity of Jerkinstown watercourse which has hydrological link with Rye Water Valley/ Carton SAC. However, with mitigation in place from the project there is no potential for in-combination effects.
N/A	N/A	TII Grand Canal – Sallins Bridge to Clonkeen (Offaly Border) Greenway, 11 km in length. Within proposed cable route Planning Application Boundary. Current construction timeline is between Q3 2023 to Q3 2025 but works not yet progressed as of 22.01.2024. The Proposed Development is due to commence in Q3 2025 and therefore, there is very limited potential for a temporal overlap of Construction Phases. Operational Phases will coincide.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to any Rye Water Valley/Carton there is no effect pathway and no potential for in-combination effects.
N/A	N/A	TII	No potential for in-combination effects.

Planning ref.	Planning Authority	Project Description	Comment
		Grand Canal Greenway – Alymer Bridge to Sallins, 11 km in length. Within proposed cable route Planning Application Boundary. The Operational Phases will coincide.	Considering the nature, scale and location of this development, and no hydrological linkage to any European site, there is no effect pathway and no potential for in-combination effects.
N/A	N/A	NTA Leinster Orbital Route comprises an orbital road proposal extending from Drogheda to the Naas/Newbridge area with intermediate links to Navan and other towns.	There is no available information on this project so an assessment cannot currently be carried out. As such in the absence of information it is assumed that there is potential for in-combination effects from pollution. Considering the nature, scale and location of this development, there is potential for in-combination impacts if Construction Phases were to overlap. However, with mitigation in place from both the Proposed Development and this project, there is no potential for in-combination effects.
N/A	N/A	NTA Emergency Diversion Routes (M50). Road link between the N3 and N4 national roads, which could provide critical infrastructure resilience in the event of incidents arising on the M50 between Junctions 6 and 7, in addition to providing potential orbital public transport corridor. Exact distance is not known at this stage as there is no defined route for this other project.	There is no available information on this project so an assessment cannot currently be carried out. As such in the absence of information it is assumed that there is potential for in-combination effects from pollution. Considering the nature, scale and location of this development, there is potential for in-combination impacts if Construction Phases were to overlap.

Planning ref.	Planning Authority	Project Description	Comment
			However, with mitigation in place from both the Proposed Development and this project, there is no potential for in-combination effects.
N/A	N/A	Microsoft Jigginstown Data Centre, which is proposed on a campus located at Jigginstown, Naas, County Kildare. This investment by Microsoft will involve a number of elements, including: • The data centre campus • Landscape improvements • Recreational facilities for the public • An electrical sub-station • A new access road • Additional infrastructure that will link the data centre to its electrical supply. 380m from the proposed cable route planning application boundary. Timeline for other development unknown. Potential for Construction Phases to overlap. Operational Phases will coincide.	Considering the nature, scale and location of this development, there is potential for in-combination impacts if Construction Phases were to overlap. However, with mitigation in place from both the Proposed Development and this project, there is no potential for in-combination effects.
N/A	N/A	Osberstown Data Centre. A 37 hectare plot on the Caragh Road in Naas has been zoned for a data centre development in the Naas Local Area Plan 2021-2027. Project is 760 m from the proposed cable route planning application boundary. Land zoned for data centre development in the Naas Local Area Plan. However, there is no design progressed at this stage and no known timeline for the development to complete an assessment at this stage.	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to any European site, there is no effect pathway and no potential for in-combination effects.
N/A	ABP	Water Supply Project	No potential for in-combination effects. Considering the nature, scale and location of this development, and no hydrological linkage to Rye

Planning ref.	Planning Authority	Project Description	Comment
		Drinking water transfer pipeline from Ardnacrusha on the River Shannon to Peamount in South County Dublin, including a Water Treatment Plant at Peamount. The Water Supply Project will cross under the proposed cable route in the vicinity of Joint Bay 30. Construction of the Water Supply Project is currently scheduled to commence in mid-2026 and will take approximately 4.5 years to construct. There is therefore potential for Construction Phases to overlap and Operational Phases will coincide.	Valley/Carton SAC there is no effect pathway and no potential for in-combination effects.20

7.1 Conclusions of in-combination assessment

In the absence of mitigation there is potential for in-combination effects from the Meath County Development Plan, Kildare County Development Plan and EirGrid Grid Implementation Plan. For projects in the absence of mitigation there is potential for in-combination effects from: 201143, 20840/310016, 314232, 22314564, 23794, 212217, 2360216, 191288, 191296, 21365, MCC R156 Jenkinstown Road Improvement Scheme, NTA Leinster Orbital Route, NTA Emergency Diversion Route (M50) and Microsoft Jigginstown Data Centre. For all of the above listed plans and projects, before mitigation there is potential for in-combination effects. However, with mitigation in place from both the Proposed Development and a plan or project, or from the Proposed Development alone and as detailed in Section 6, there is no potential for in-combination effects.

8. Conclusion

This NIS examined the implications of the Proposed Development, alone or in combination with other plans or projects, on the integrity of the following European site in view of the site's conservation objectives: the Rye Water Valley/Carton SAC 001398. The NIS details mitigation measures which have been prescribed to ensure the Proposed Development will not result in adverse effects on the integrity of the European site either alone or in-combination with other plans or projects.

Based on the best available scientific information, it is considered that with the mitigation measures detailed above, there will be no adverse effects on the integrity of Rye Water Valley/Carton SAC, or any other European sites alone or in-combination with other plans or projects considering the site's conservation objectives. The NIS contains information which the competent authorities may consider in making its own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Proposed Development, alone or in-combination with any other plan or project, on the integrity of the relevant European sites.

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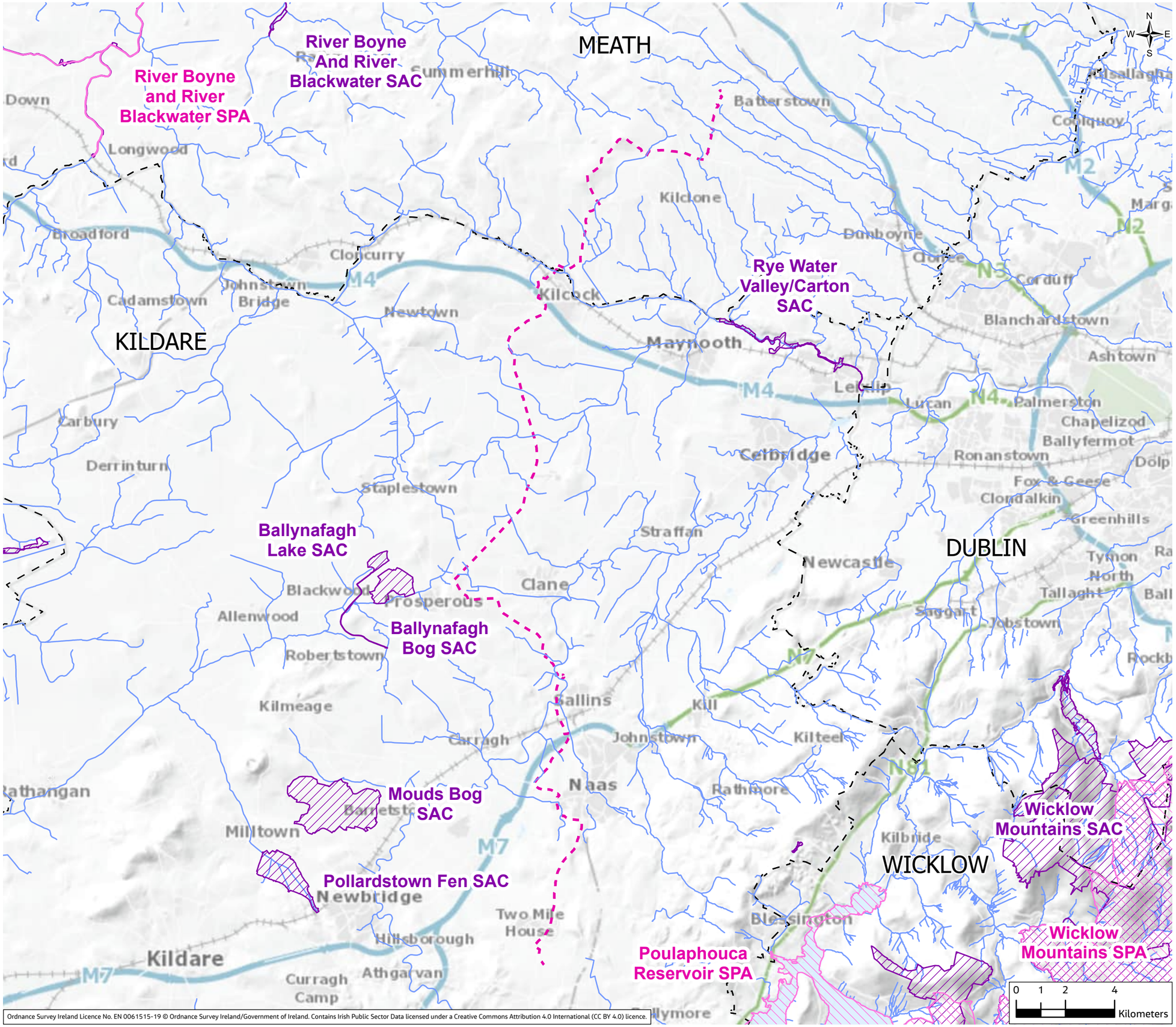
Appendix A. Figure 1 (321084AH-JAC-ZZ-XX-DR-K-3036). Cable route, with nearest European sites and Watercourses



Appendix A; Figure 1

Legend

- Proposed Cable Route
- County Boundary
- Watercourses

European sites

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
01	Apr 2023	Final	PM	SJ	FL	FB

Client: EirGrid

Jacobs
Merrion House, Merrion Road, Dublin, D04 R2C5, Ireland.
www.jacobs.com

Project: Kildare-Meath Grid Upgrade

Drawing Title: Proposed cable route and nearby European Sites

Drawing Status: Final

Scale @ A3	1:150,000	DO NOT SCALE
Jacobs No.	321084AH	
Client No.	CP966	

Drawing No.: 321084AH-JAC-ZZ-XX-DR-K-3000

Appendix B. Figure 2 (321084AH-JAC-ZZ-XX-DR-K-3037). Waterbodies with connectivity to Rye Water Valley/Carton SAC

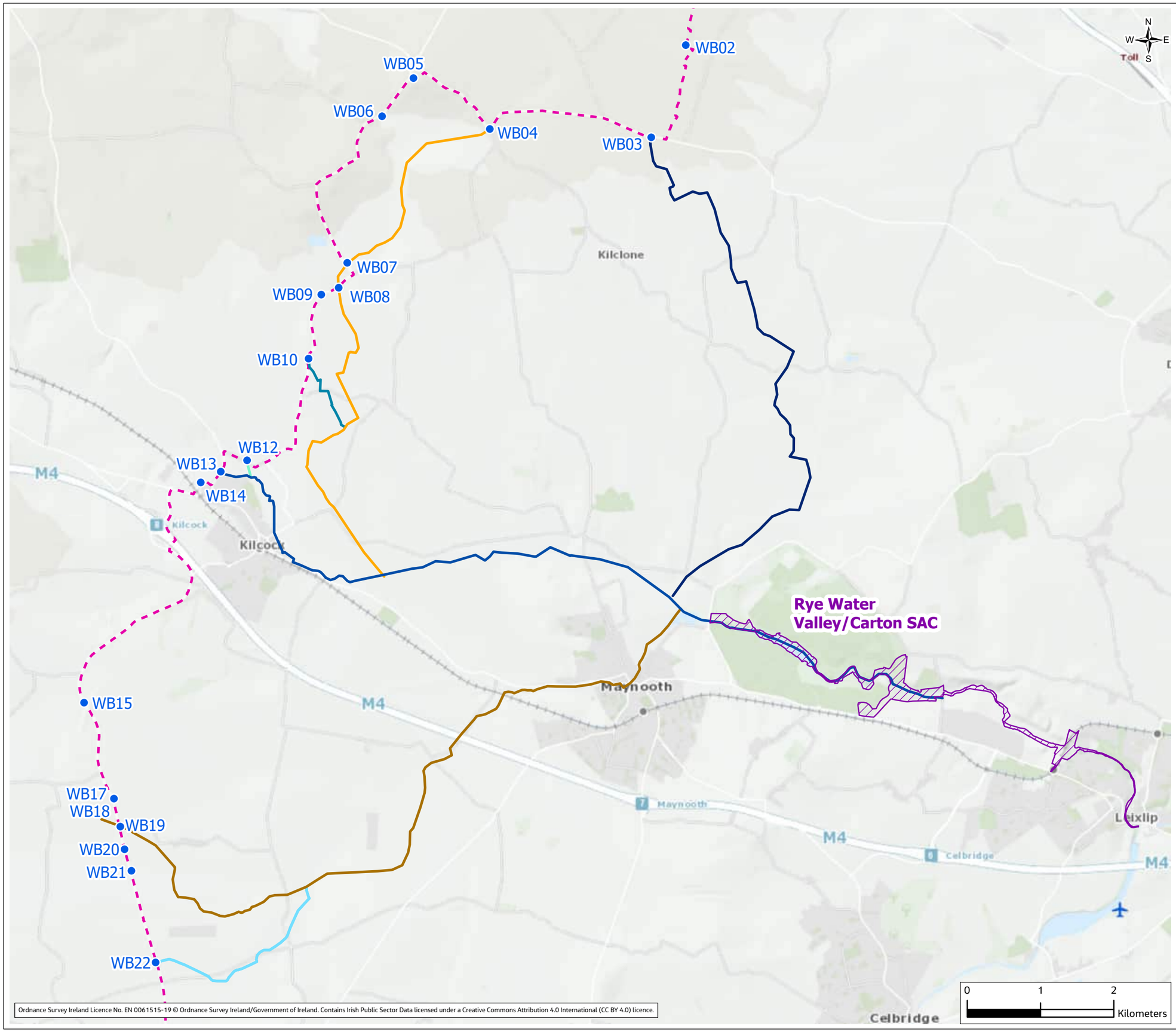


Figure 2

Legend

- Proposed Cable Route
- Waterbody (WB) Cable Crossing Number

Waterbodies

- Rye Water

Tributaries of Rye Water

- Baltracey River flows into River Lyreen
- Bride Stream
- Cullendrach
- Jenksinstown Stream
- River Lyreen
- Baltracey River
- Unnamed drain into Lyreen River
- Unnamed flows into Rye Water
- Unnamed stream into Rye Water

European sites

- Special Area of Conservation (SAC)

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
	Mar 2023	Final	PM	SJ	FJ	FB

Client: EIRGRID

Jacobs
Merrion House, Merrion Road, Dublin, D04 R2C5, Ireland.
www.jacobs.com

Project: Kildare-Meath Grid Upgrade

Drawing Title: Waterbodies with connectivity to Rye Water Valley/Carton SAC

Drawing Status	Final	
Scale @ A3	1:50,000	DO NOT SCALE
Jacobs No.	321084AH	
Client No.	CP966	
Drawing No.	321084AH-JAC-ZZ-XX-DR-K-3036	

Appendix C. Appropriate Assessment Screening Report

Available at www.eirgridkildaremeath.ie