

# **Water Framework Directive Assessment Report**

## **Proposed 110kV Substation and Underground Grid Connection**

On behalf of  
**Soleirtricity Lisheen Ltd**

at  
**Killoran, Co. Tipperary**





Ground Floor – Unit 3  
Bracken Business Park  
Bracken Road, Sandyford  
Dublin 18, D18 V32Y  
Tel: +353- 1- 567 76 55  
Email: enviro@mores.ie

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**Prepared By: Jennifer Hand**

**Signed:** Jennifer Hand

**Checked By: Jennifer Moran / Laura McGrath**

**Signed:** JM / LMG

**Approved By: Kevin O'Regan**

**Signed:** KOR

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**Killoran, Co. Tipperary**

**Contents**

<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1	Site Location	1
1.1.1	Former Lisheen Mine	2
1.1.2	National Bioeconomy Campus	4
1.1.3	The Lisheen Wind Farm	5
1.2	Planning Background	5
1.2.1	Permitted Planning Permissions	5
1.3	Site Context and Description	6
1.4	Regulatory Context Overview	7
1.4.1	EU Legislation - Water Framework Directive	7
1.4.2	National Policy	9
1.4.3	County Development Plan	9
<b>2</b>	<b>METHODOLOGY, SCOPE AND POLICY CONTEXT</b>	<b>11</b>
2.1	Common Implementation Strategy	11
2.2	Assessment Criteria	13
2.2.1	Surface Water Quality Assessment	13
2.2.2	Groundwater Quality Assessment	14
<b>3</b>	<b>DESCRIPTION OF THE PROPOSED DEVELOPMENT</b>	<b>15</b>
3.1	110kV Tail-Fed Substation	15
3.1.1	110kV Underground Grid Connection	16
3.1.2	110kV Underground Grid Connection	16
3.1.3	Drainage	16
3.1.4	Earthworks	17
3.2	Specialist Ecological Input / Sensitive Design	17
3.3	Construction Procedures	18
3.3.1	UGC Construction Methodology	19
3.3.2	Hours of Work	19

3.3.3	Temporary Construction Compound	19
3.3.4	Waste Management – Construction	19
3.3.5	Monitoring Works	20
3.4	Operational Procedures	20
3.4.1	Waste Management	20
3.5	Decommissioning	20
<b>4</b>	<b>STUDY AREA SCREENING</b>	<b>22</b>
4.1	Surface Water	22
4.2	Groundwater	23
4.3	Groundwater Usage	24
4.4	Water Pressures	26
4.5	Protected Sites	26
4.5.1	European Designated Sites	26
4.5.2	Nationally Designated Sites - Register of Protected Areas	26
4.6	Other Facilities/ Developments	26
4.7	Screening	27
<b>5</b>	<b>IMPACT ASSESSMENT</b>	<b>29</b>
5.1	Groundwater Bodies	29
5.2	Mitigation Measures	30
5.2.1	Construction Phase	30
5.2.2	Operational Phase	32
5.2.3	Decommissioning	32
<b>6</b>	<b>CONCLUSIONS</b>	<b>34</b>
<b>7</b>	<b>REFERENCES</b>	<b>35</b>

## FIGURES

Figure 1-1:	Site Location	2
Figure 1-3:	IPC Licence Boundary	4
Figure 1-3:	Site Context	7
Figure 2-1:	WFD Screening Assessment	12
Figure 4-1:	WFD Surface Waterbodies	23
Figure 4-2:	Groundwater Bodies	24
Figure 4-3:	Groundwater Wells within 2km of the Site	25

## **TABLES**

Table 4-1: Summary of Surface Waterbodies Within the Study Area.....	23
Table 4-2: EPA Water Pressures on Waterbodies within study area .....	26
Table 4-3: Screening Table .....	27
Table 5-1: Thurles Groundwater Body .....	29

## 1 INTRODUCTION

Malone O'Regan Environmental ('MOR Environmental') have been commissioned by Soleirtricity Lisheen Ltd. ('the Applicant') to undertake a Water Framework Directive ('WFD') Assessment Report in respect of the Construction, Operation and Decommissioning of a proposed 110kV substation (henceforth referred to as the '110kV Substation') and associated 110kV underground cable (henceforth referred to as the 'UGC') connecting the proposed 110kV Substation to the existing Lisheen 110kV ESB substation and all associated works.

The 110kV Substation and UGC (henceforth collectively referred to as 'the Proposed Development') will be located at Killoran, Thurles, Co. Tipperary (ITM OS Reference 621463 666719).

The Proposed Development will transmit power from the permitted Lisheen Solar Photovoltaic ('PV') Farm (Planning Ref: 21/1128) (henceforth referred to as the 'Permitted Solar Development') via the UGC, which will connect into the existing Lisheen 110kV ESB substation located circa ('ca.') 750m west of the Permitted Solar Development. Please note that this Permitted Solar Development has received a 76MEC AC Eirgrid Grid Connection Offer to export to the national electricity transmission system.

### 1.1 Site Location

The Proposed Development will be located on a site that is ca. 2 hectares ('ha') and is situated in the townland of Killoran, North Tipperary, ca. 6.3km northwest of Urlingford and ca. 12.6km southeast of Templemore (henceforth referred to as the 'Site'). The Site is shown in Figure 1-1.

The Permitted Solar Development will be located on the former Tailings Management Facility ('TMF') on lands that Vedanta Lisheen Mining Limited currently manages under an Integrated Pollution Control ('IPC') License P0088-04 that the Environmental Protection Agency ('EPA') regulates.

**Figure 1-1: Site Location**



The aim of this WFD Assessment was to screen any potential direct or indirect effects of the Proposed Development that could result in any effects on waterbodies under the Water Framework Directive [1] in such a way as to:

- Jeopardise the achievement of the following for any directly or indirectly connected groundwater body or surface waterbody:
  - Good quality status;
  - Good chemical status; or,
  - Good ecological potential.
- Contribute to the risk of any directly or indirectly connected waterbody from failing to achieve “good” status;
- Result in a deterioration in the status of a waterbody; and,
- Degrade the ecological quality of the protected sites associated with connected waterbodies or jeopardise the goals and/or targets set out for these protected sites.

### **1.1.1 Former Lisheen Mine**

The Site comprises a section of the former Lisheen Mine. 1Chevron Limited discovered the Lisheen deposit of lead and zinc in 1990. Minorco Lisheen Limited began developing the mine in 1997 by constructing the main mine decline and facilities. From the outset, the Lisheen Mine operated under an IPC licence, issued by the EPA. Ivernia West and Anglo-American initially carried out mining.

Lead and zinc production commenced in 1998, with the first production ore brought to the surface in 1999. Mining activity continued for 17 years. At its peak, the mine employed 400

staff and was the 12<sup>th</sup> largest zinc mine in the world. The mine produced an average of 6,000 tonnes of lead and zinc ore per day, around 300,000 tonnes of ore per year and a total of 22.4 million tonnes overall.

The total landholding of the former Lisheen Mine was 445ha. The ore deposits were extracted from depths of up to 200m below the surface from four distinct ore bodies:

- Main Zone;
- Derryville Zone;
- Bog Zone; and,
- Derryville Island Zone.

The Lisheen Mine was operated under an IPC licence issued by the EPA on 27<sup>th</sup> June 1997 to Minorco Lisheen Limited. Production at the mine ceased in 2015. All closure works have been completed at the site, and following two years of Active Closure and three years of Passive Closure, the mine transitioned to Aftercare in June 2021. There have been several amendments to the licence since 1997 via the Technical Amendment ('TA') process. The extent of the land currently under IPC licence (P0088-04 [1]) are shown in Figure 1-3. The Site is outside the Vedanta IPC Licence boundary as defined in Technical Amendment A to the IPC Licence P0088-04 dated 2<sup>nd</sup> April 2020 [3].

The EPA has independently signed off on the condition of the Site. The Agency are legally bound under Section 95(7) of the Environmental Protection Agency Act 1992, as amended, to ensure that they are:

*'...satisfied that the condition of the relevant installation is not causing or likely to cause environmental pollution and the site of the activity is in a satisfactory state, it shall accept the surrender of the licence or revised licence, but otherwise shall refuse to accept the surrender of the licence or revised licence.'*

As part of the process to remove the Site from the Vedanta Licence, the EPA undertook an exit audit of the Vedanta lands. The overall audit finding was as follows.

*"The condition of those surface areas of the site proposed to be excluded from the licence (identified as 'Stage 2' areas) were assessed and it was the opinion of the inspector that those areas were in a satisfactory state on the day of the visit. Based on this and on the information supplied by the licensee (in particular - the final 'Validation Report in Respect of Lisheen Mine' updated and submitted under licensee return LR036661 on 11/09/2018), those 'Stage 2' areas were considered unlikely to cause environmental pollution or to contain any potentially polluting residues." [6].*

Figure 1-2: IPC Licence Boundary



Obtaining formal sign-off on the Site by an independent third party, such as the EPA, is very important, as it provides reassurance in relation to the condition of the Site. The EPA legally could not have removed the Site from the Vedanta licence unless they were satisfied that the lands were in a satisfactory condition.

### 1.1.2 National Bioeconomy Campus

The Site forms part of the National Bioeconomy campus. A key objective of the Tipperary County Development Plan 2022-2028 ('TCDP') is to facilitate and support the development of the National Bioeconomy Campus at Lisheen, Co. Tipperary. The development of the bioeconomy campus at Lisheen will be plan-led with a masterplan to be put in place. Synergies between the proposed campus and Thurles town will be identified at the Local Area Plan ('LAP') stage [4].

The TCDP provides the Irish Bioeconomy Foundation ('IBF') with a range of stakeholders, including universities and private enterprises and is supported through Enterprise Ireland. The campus will have a range of facilities that will enable industry entrepreneurs and researchers to scale technologies that convert Ireland's natural resources (including residues) to products of high value for use in a wide variety of sectors, including food ingredients, feed ingredients, pharmaceuticals, natural chemicals, biodegradable plastics and more.

The IBF is set to expand its operations due to a grant award from the European Union's Just Transition Fund. The new funding will help facilitate the scale-up and demonstration of novel biotechnological approaches for biomanufacturing at the site.

While the previous activity at the mine resulted in high energy usage, the transformed bioeconomy campus is all about circularity and sustainability. The National Bioeconomy Campus currently consists of the following enterprises:

- Revive Environmental;

- Naring-Tech Limited;
- Lisheen Wind Farms;
- Acorn Recycling;
- Soleirtricity Lisheen; and,
- Tipperary County Council.

It is an objective of the LAP to promote and support the growth and development of the National Bioeconomy Campus as an important employment location with strong ties, maximising its residential and employment potential.

The bioeconomy is the part of the economy that uses renewable resources while reducing waste, supporting the achievement of a sustainable and climate-neutral society.

In developing the design and this planning application, the Applicant has engaged extensively with the IBF to ensure the Proposed Development meets the criteria for the National Bioeconomy Campus. Through collaborative engagement and ongoing communication, Soleirtricity will seek to build positive relationships in the community and secure strong support for this transformative project for the regions. These relationships will also benefit and support the economy and locality near Lisheen by creating attractive job opportunities.

### **1.1.3 The Lisheen Wind Farm**

The Lisheen Wind Farm became operational in August 2009, with eighteen wind turbines erected across the former Lisheen Mine complex, with another 24 wind turbines neighbouring the Site, all of which connect to the Lisheen 110kV ESB substation.

These turbines are currently maintained and operated by Brookfield Renewable. The lands are leased from Lisheen Mine, on which the turbines and other infrastructure necessary for the operation of the Wind Farm are located. The current owners of these wind farms have access rights to all these turbines. However, this access requirement is not considered to be a constraint on the Proposed Development.

The presence of these wind turbines will help to reinforce the Site's position as a green campus, promoting the use of sustainable energy sources.

## **1.2 Planning Background**

### **1.2.1 Permitted Planning Permissions**

The Proposed Development will be critical infrastructure, intrinsically linked to permitted and planned renewable energy projects, that will initially comprise a large-scale consented solar development.

The Proposed 110kV Substation will be required to facilitate a step-up of the medium voltage supply (33kV) from the Permitted Solar Development to the existing Lisheen 110kV ESB Substation. The design of the Proposed Development will mean that it could be readily expanded in the future to accommodate other renewable energy projects and, as such, it will be a key node on the grid.

It is proposed that, subject to obtaining consent for the Proposed Development, the proposed 110kV substation will be developed in place of a previously permitted 38kV substation granted by Tipperary County Council (Planning Ref: 211128).

It is predicted that the Proposed Development will be constructed in conjunction with the Permitted Solar Development as part of one development (henceforth known as the 'Overall Development').

## **Tipperary County Council Planning Ref: 211128 – Granted**

Permission currently exists for a PV development on site (Planning Permission Ref No. 211128):

*The construction of a Solar PV development with a maximum export capacity ('MEC') of up to 122MW, comprising ca. 214,800 no. photovoltaic panels laid out in arrays, the construction of a 38kV Substation (ca. 57.31m<sup>2</sup> x 4.45m tall), along with associated ancillary development, including 30 no. Transformer Stations (ca. 7.27m<sup>2</sup> x 2.6m) with an integrated bund, 716 string Inverters, 1 no. DNO Substation Building (16.28m<sup>2</sup> x 5.42m), 1 No. Storage and maintenance building (ca. 57.31m<sup>2</sup> x 4.45m tall), 38 no. CCTV cameras mounted on ca. 3.8m high poles, perimeter security fencing and all ancillary works. The total development area will be ca. 77ha.*

Tipperary County Council granted the Permitted Solar Development on 23<sup>rd</sup> February 2022.

The proposed 110kV substation would be developed in lieu of a permitted 38kV substation granted by Tipperary County Council.

### **1.3 Site Context and Description**

The Site is ca. 2ha in size and situated in the townland of Killoran, North Tipperary, ca. 6.3km northwest of Urlingford and ca. 12.6km southeast of Templemore. The Site is accessed from the existing Lisheen Mine entrance via the L3201 road. The Site is in proximity to Junction 4 on the M8 (north of Urlingford) motorway and the R502 and R639 regional roads.

The Site is currently vacant and comprises predominantly of recolonising bare ground and areas of artificial surfaces. The existing Lisheen 110kV ESB substation is located immediately to the north of the Site. To the east, the Site is bounded by the former Tailing Management Facility and the Permitted Solar Development. To the west of the Site is a building currently occupied by Irish Bioeconomy Foundation personnel, recently acquired by Tipperary County Council. To the south of the Site are two buildings occupied by AQS Environmental Solutions personnel, along with associated carparking.

The surrounding wider area is a mix of the Lisheen Mine Windfarm and associated infrastructure, agricultural farmland and bogland currently harvested by Bord Na Móna.

Figure 1-3: Site Context



## 1.4 Regulatory Context Overview

### 1.4.1 EU Legislation - Water Framework Directive

The WFD (2000/60/EC) [1], as amended by Directives 2008/105/EC and 2013/39/EU, requires EU Member States to protect and improve water quality. It applies to all groundwater and all surface waters, including transitional (estuarine) and coastal waters. This includes both natural and “artificial and heavily modified bodies of water”. An ‘artificial’ waterbody is defined in Article 2(8) as ‘a body of surface water created by human activity’ and a ‘heavily modified’ waterbody is defined in Article 2(9) as ‘a body of surface water which, as a result of physical alterations by human activity, is substantially changed in character’.

The long-term aim of the WFD is for all ground and surface waters within the EU to achieve and maintain at least ‘good’ status. The WFD was given legal status in Ireland via the European Communities (Water Policy) Regulations 2003 (S.I. 722/2003), as amended [4].

Article 1 of the WFD sets out that the purpose of the directive is to establish a framework which:

*“...prevents further deterioration and protects and enhances the status of aquatic ecosystems”, “promotes sustainable water use”, and “aims at enhanced protection and improvement of the aquatic environment inter alia through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of priority hazardous substances”.*

Article 4 of the WFD sets out environmental objectives. In relation to surface water, Article 4(1)(a) states that:

*“(i) Member States shall implement the necessary measures to prevent the deterioration of the status of all bodies of surface water...”*

*“(ii) Member States shall protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status at the latest 15 years after the date of entry into force of this Directive...”*

*“(iii) Member States shall protect, enhance and restore all artificial and heavily modified bodies of water with the aim of achieving good ecological potential and good surface water chemical status at the latest 15 years after the date of entry into force of this Directive...”*

Article 4(1)(b) places the same obligation to prevent deterioration in relation to groundwater and, in addition, places an obligation to:

*“protect, enhance and restore all bodies of groundwater, ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater status at the latest 15 years after the date of entry into force of this Directive...”*

Article 4(7) states that:

*“Member States will not be in breach of the WFD when failure to achieve good groundwater or ecological status or ecological potential is the result of new modifications to the physical characteristics of a surface water body / alterations to the level of a groundwater body, or failure to prevent deterioration from ‘high’ to ‘good’ status is the result of new sustainable human development activities and all the following conditions are met:*

- All practicable steps are taken to mitigate the adverse impact;*
- The reasons for the modifications / alterations are set out in the river basin management plan;*
- The reasons for the modifications / alterations are of over-riding public interest / the benefits of achieving good status are outweighed by the benefits of the modifications / alterations; and,*
- The benefits of the medications / alterations cannot, for reasons of technical feasibility or disproportionate cost, be achieved by other means, which are a significantly better environmental option”.*

Article 7(1) requires Member States to identify within each river basin:

*“...all bodies of water used for the abstraction of water intended for human consumption providing more than 10m<sup>3</sup> a day as an average or serving more than 50 persons and those bodies of water intended for such future use.*

*Member States shall monitor, in accordance with Annex V, those bodies of water which according to Annex V provide more than 100m<sup>3</sup> a day as an average.”*

Annex IV lists the relevant protected areas as:

- i. “Areas designated for the abstraction of water intended for human consumption under Article 7;*
- ii. areas designated for the protection of economically significant aquatic species;*

- iii. *bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC<sup>1</sup>;*
- iv. *nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC<sup>2</sup> and areas designated as sensitive areas under Directive 91/271/EEC<sup>3</sup>; and,*
- v. *areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC<sup>4</sup> and Directive 79/409/EEC<sup>5</sup>.”*

Article 11 requires each Member State to establish a “programme of measures” to achieve the objectives set out in Article 4.

### 1.4.2 National Policy

Since 2010, the Government of Ireland has created River Basin Management Plans (‘RBMPs’) which operate on a renewing six-year cycle. The purpose of these RBMPs is to set targets to address water quality issues, including the protection, improvement and sustainable management of the water environment, in line with the WFD. The first WFD cycle ran from 2009-2015, and the second cycle operated from 2016-2021. The current (third) cycle runs from 2022-2027, and the associated RBMP was named “Water Action Plan 2024” and published in September 2024, following public consultation [5].

### 1.4.3 County Development Plan

The relevant current County Development Plan (‘CPD’) for the Site is Tipperary County Development Plan (‘TCDP’) 2022 – 2028 [6]. The CDP came into effect on the 11<sup>th</sup> July 2022 and includes the following relevant policies:

#### **Planning Policy**

##### **11-1**

- *“In assessing proposals for new development to balance the need for new development with the protection and enhancement of the natural environment and human health. In line with the provisions of Article 6(3) and Article 6 (4) of the Habitats Directive, no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects).”*

##### **11-4**

- *“(a) Conserve, protect and enhance areas of local biodiversity value, habitats, ecosystems and ecological corridors, in both urban and rural areas, including rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands in*

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<sup>1</sup> The Bathing Water Directive – Directive 76/160/EEC was repealed by Directive 2006/7/EC (as amended) [26]

<sup>2</sup> The Nitrates Directive – Directive 91/676/EEC (as amended) [27]

<sup>3</sup> The Urban Wastewater Treatment Directive – Directive 91/271/EEC (as amended) [28]

<sup>4</sup> The Habitats Directive – Directive 92/43/EEC (as amended) [29]

<sup>5</sup> The Birds Directive – Directive 79/409/EEC was repealed by Directive 2009/147/EC (as amended) [30]

accordance with the objectives of the National Biodiversity Plan (DCHG 2017) and any review thereof;

- (b) Safeguard, enhance and protect water bodies (rivers/canals/lakes) and river walks and to provide links, where possible to wider green infrastructure networks as an essential part of the design process;
- (c) Require an 'Ecosystem Services' approach for new development to incorporate nature-based solutions to SUDS, in so far as practical, as part of water management systems, public realm design and landscaping, in line with best practice; and,
- (d) Where trees or hedgerows are of particular local value, the Council may seek their retention, or where retention is not feasible, their replacement. It will seek a proactive focus on new tree-planting as part of latest developments."

#### 11-5

- "Ensure that new developments proposed in or near 'Ground Water Protection Schemes' and 'Zones of Contribution' which contribute to public water supplies, do not result in a significant negative impact on the integrity, function and management of these important assets."

#### 11-7

- "(a) Ensure the protection of water quality in accordance with the EU WFD, and support the objectives and facilitate the implementation of the associated Programme of Measures of the River Basin Management Plan 2018-2021 and any successor. This includes contributing towards the protection of Blue-Dot catchments and drinking water resources. Also, have cognisance of the EU's Common Implementation Strategy Guidance Document No.20 and 36 which provide guidance on exemptions to the environmental objectives of the WFD;
- (b) Support an integrated and collaborative approach to catchment management in accordance with the River Basin Management Plan 2018-2021 and any successor; and,
- (c) Require an undisturbed edge or buffer zone to be maintained, where appropriate, between new developments and riparian zones of water bodies to maintain the natural function of existing ecosystems associated with water courses and their riparian zones, and to enable sustainable public access."

#### 15-3

- "Protect the Irish Water Eastern and Midlands Water Supply Project pipeline corridor from inappropriate development that would prejudice the delivery of the project and to refer any planning applications within the development corridor to Irish Water for comment."

## 2 METHODOLOGY, SCOPE AND POLICY CONTEXT

### 2.1 Common Implementation Strategy

In order to assist in the implementation of the WFD, EU member states, alongside Norway and the European Commission, developed a “Common Implementation Strategy” (‘CIS’) in May 2001. This CIS was designed to provide coherent and comprehensible guidelines aimed at achieving the aims of WFD.

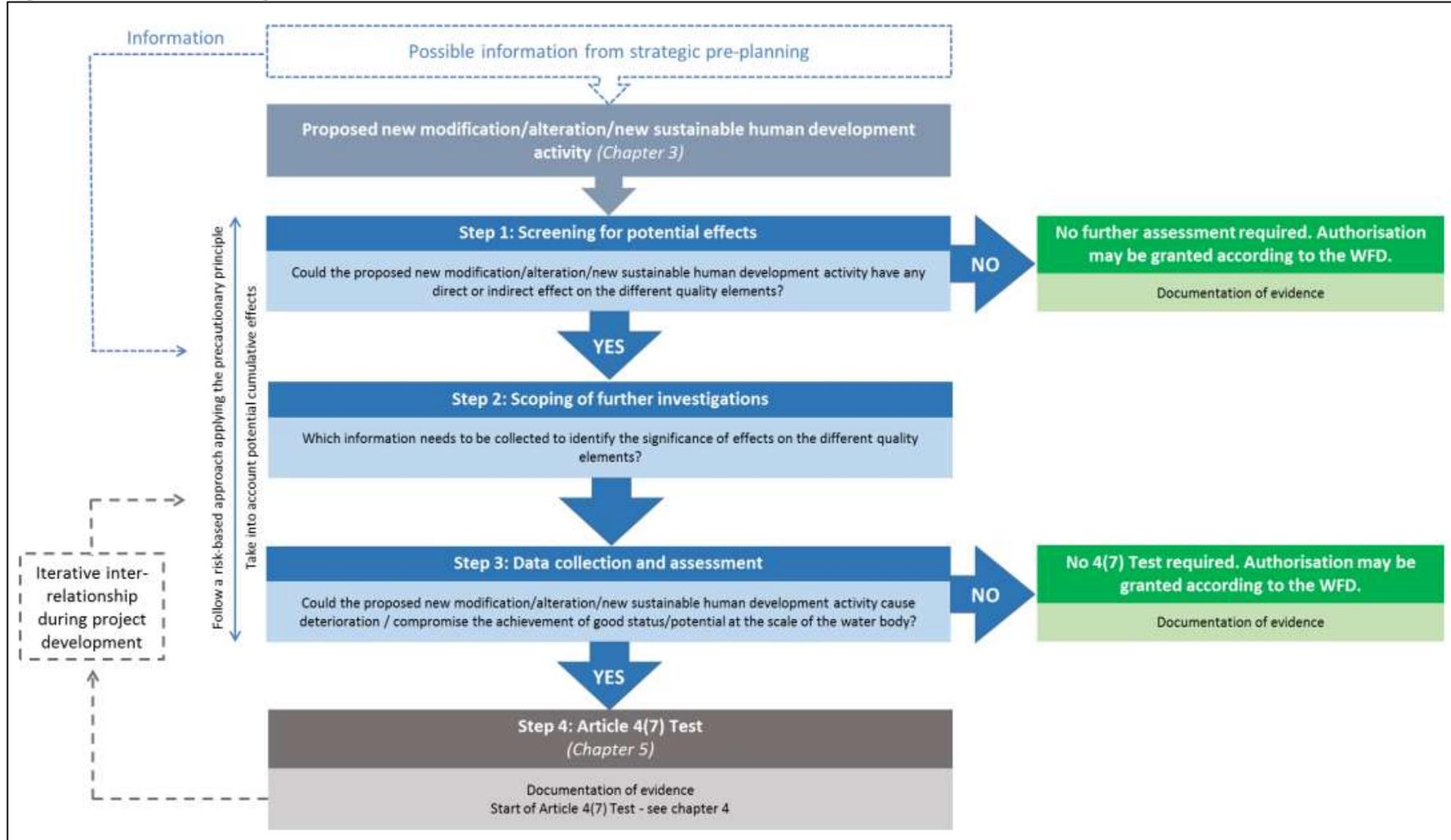
Figure 4 of the CIS Guidance Document 36 – “Exemptions to the Environmental Objectives according to Article 4(7)” [7] provides an outline of an approach to WFD Assessments. This figure, reproduced in Figure 2-1 below, breaks the assessment down into the following sequential steps:

- Screening for Potential Effects - Determine whether the Project could have any direct or indirect effect on the different quality elements relevant to the WFD;
- Scoping of Further Investigations - Outline the information required to determine the significance of any effect on the relevant quality elements; and,
- Data Collection and Assessment - Assess whether any effect could cause deterioration or compromise the status / potential status of a water body.

If the project is determined to compromise or deteriorate the status / potential status of a waterbody, then a “Article 4(7) Test” is required. Assessment under Article 4(7) is summarised in CIS Guidance Document 36 [7].

If no effects are identified, then no Article 4(7) assessment is required, and the project may be authorised according to the WFD.

Figure 2-1: WFD Screening Assessment



## 2.2 Assessment Criteria

### 2.2.1 Surface Water Quality Assessment

Under the WFD [1], surface water bodies are defined as either:

- Rivers;
- Lakes;
- Transitional waters;
- Coastal waters;
- Artificial surface water bodies; and,
- Heavily modified surface water bodies.

The water quality status for surface waterbodies is classified into five quality classes, i.e. 'high', 'good', 'moderate', 'poor' and 'bad'. These classes are assessed on different attributes of the waterbody, i.e. the biological quality of the waterbody, the physio-chemical quality of the waterbody and the hydromorphological quality of the waterbody. The biological quality of the waterbody is dependent on the abundance and diversity of macroinvertebrates and corresponds with a biotic index or "Q Value". These values are as follows:

- Q5, Q4-5 – High WFD Status;
- Q4 – Good WFD Status;
- Q3 – Q4 – Moderate WFD Status;
- Q3, Q2-3 – Poor WFD Status; and,
- Q2, Q1-2, Q1 – Bad WFD Status.

The physio-chemical status of the waterbody is representative of several physical parameters, including temperature and pH, and several chemical parameters, including dissolved oxygen, nutrients and specific chemical pollutants.

The hydromorphology of a waterbody describes its physical characteristics in terms of the movement of water flows and levels ('hydro'), and the structure and form of the bed, banks and riparian zones and how they function within the surrounding landscape ('morphology'). Good hydromorphological conditions are required to create and maintain diverse aquatic habitat for invertebrates, fish and plants, which in turn support healthy aquatic ecosystems and good ecological status. If a waterbody is modified by anthropogenic activity, e.g. channelisation and straightening of rivers, installation of weirs or other instream barriers, culverting or otherwise installing hard engineering works, and removal of natural features such as sand and gravel banks and riparian vegetation, the waterbody may experience hydromorphology pressures and a decrease in overall quality.

Each natural surface waterbody is assessed on its ecological status and its chemical status. Ecological status is assessed based on the following categories, with each category receiving a rating of "High," "Good," "Moderate," "Poor" or "Bad":

- Biological quality (aquatic flora and fauna);
- Physiochemical quality (temperature, oxygenation, nutrient conditions); and,
- Hydromorphological quality (waterflow, sediment composition and movement, riverbank structure, etc).

The overall ecological status is based on the lowest of the three individual categories.

In the case of artificial and heavily modified waters, ecological potential status is assessed similarly to the ecological status above, but is rated as “Maximum,” “Good,” “Moderate,” “Poor” or “Bad” ecological potential instead. In general terms, ‘maximum ecological potential’ means that the waterbody is as close as possible to a comparable surface waterbody, with the only differences being those directly attributed to the artificial or modified nature of the waterbody.

Chemical status is given one of two ratings: ‘Good’ or ‘Failing to Achieve Good.’ For an assessment of ‘Good,’ no substance listed in the S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 (as amended) [8] may be found in concentrations above the relevant environmental quality standard limits set out in the regulations.

The overall chemical status of a waterbody is determined by the lowest status found to apply.

### **2.2.2 Groundwater Quality Assessment**

Groundwater is awarded either “Good” or “Poor” status. Groundwater is assessed based on its chemical and quantitative status.

Water quality for groundwater is classified into two quality classes, i.e. ‘good’ and ‘poor’, based on the status of its chemical and quantitative attributes. Similar to surface water, the chemical status of a groundwater body is dependent on its physio-chemical parameters, whereas the quantitative status is based on the availability and sustainability of the groundwater resource.

The overall quality status of any waterbody is based on the quality score of the lowest-scoring attribute.

Good chemical status of a groundwater body requires the entry of hazardous substances and saline intrusion into the groundwater to be prevented, and the presence of other pollutants to be below the limits within S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 (as amended) [9]. Concentrations of pollutants must also not be of such a concentration as to affect the ecological or chemical status of associated surface waters or to damage linked terrestrial ecosystems.

Quantitative status is assessed based on whether or not the available groundwater resource is being reduced by the long-term rate of annual abstraction and is rated as “Good” or “Poor.”

### 3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The Proposed Development will comprise of:

- Construction of a new 110kV tail-fed transmission substation; and,
- Underground cable connecting the substation to the existing Lisheen 110kV ESB Substation.

#### 3.1 110kV Tail-Fed Substation

The Proposed Development will consist of a 10 year permission for a 110kV electrical substation and associated 110kV underground grid connection, cabling and associated works. The Proposed Development will transmit power from a solar farm (permitted under Tipperary County Council Reg. Ref: 21/1128), which will connect into the existing Lisheen 110kV ESB substation.

The proposed 110kV electrical substation in Killoran, on a site of 2ha will consist of:

- a) 1 no. electrical substation compound and access road, palisade fencing and gates;
- b) 1 no. electrical substation compound / IPP control building measuring 10.74m x 20.15m and 6.920m in height;
- c) Station compound extension required at Lisheen 110kV station to facilitate the new Cooleeny 110kV cable bay;
- d) 1 no. Eirgrid switch room building measuring 18m x 25m and 8.55m in height;
- e) 1 no. lightning protection monopoles measuring up to 22m in height;
- f) A main step-up transformer;
- g) Associated ancillary equipment such as electrical apparatus, plant and equipment;
- h) Overhead and underground electrical and communications cabling and ancillary works; and,
- i) All associated ancillary works above and below ground including raising a portion of the site by ca.1m using imported engineering fill;

This switchyard will be enclosed in a palisade-type security fence. The proposed 110kV substation will also have its own control building to house the indoor switchgear and control and protection equipment.

The Proposed 110kV Substation is required to coincide with the 76 MEC AC EirGrid Offer for the Permitted Development. This switchyard will be enclosed in a palisade-type security fence. The proposed 110kV substation will also have its own control building to house the indoor switchgear and control, and protection equipment.

The Proposed 110kV Substation is required to coincide with the 76 MEC AC EirGrid Offer for the Permitted Development.

#### CCTV

The on-site CCTV would be remotely monitored via a 24/7 operational team who would alert all relevant personnel in the event of a break-in or vandalism at the Site. The cameras will only be focused along the fence line and will not be focused on any residential properties.

#### Fencing

The switchyard will be enclosed in a palisade-type security fence. A perimeter fence will be installed to provide security and restrict access by wildlife.

## Lighting

Emergency lighting will only occur as part of the Proposed Development.

### **3.1.1 110kV Underground Grid Connection**

#### CCTV

The on-site CCTV would be remotely monitored via a 24/7 operational team who would alert all relevant personnel in the event of a break-in or vandalism at the Site. The cameras will only be focused along the fence line and will not be focused on any residential properties.

#### Fencing

The switchyard will be enclosed in a palisade-type security fence. A perimeter fence will be installed to provide security and restrict access by wildlife.

## Lighting

Emergency lighting will only occur as part of the Proposed Development.

### **3.1.2 110kV Underground Grid Connection**

The 110kV underground cabling is proposed from the proposed 110kV substation to the existing Lisheen 110kV ESB substation, will consist of:

- a) Ca. 225m of underground 110kV electrical cables and associated communications cables;
- b) Three 125mm diameter HDPE power cable ducts;
- c) One 100mm diameter HDPE communications ducts;
- d) One 125mm diameter earth continuity duct to be installed in an excavated trench, typically 825mm wide by 1,315mm deep;
- e) 1600sq mm Al cable;
- f) 240sq mm copper earth continuity cable;
- g) One fibre cable; and,
- h) All associated ancillary works above and below ground.

The UGC will be installed in a cable trench as per industry standards, including ducting, fibre optic conductor, insulated earthing conductor where required, as well as link boxes at some jointing locations. The Energy Supply Board ('ESB') will ultimately be responsible for ensuring that the most appropriate connection option is selected. This asset, together with the substation, will be owned and operated by the Independent Power Producer ('IPP').

### **3.1.3 Drainage**

#### Surface Water Drainage

The Proposed Development will comprise limited hardstanding, confined to the substation building footprint and access tracks required to EirGrid specification. These elements will represent a small proportion of the overall Site area.

The majority of the surfaces onsite will remain permeable surfaces, allowing rainwater to percolate directly to the ground. As a result, surface water runoff will be minimal and comparable to existing baseline conditions.

Given the limited extent of impermeable surfaces, no specific surface water drainage infrastructure will be required for the Proposed Development. The development will not require

any alteration to the existing on-site drainage regime, and surface water will continue to be managed through natural infiltration.

### Foul Water

There will be no foul drainage connections required. During the Construction Phase, portable toilets will be provided at the temporary Contractors' Compound. All waste from the portable toilets will be removed and disposed of off-site by an approved contractor.

During the Operation Phase, the facility will be unoccupied for the majority of their service life. However for design purposes, it was assumed that a maximum projected attendance at Site and in these buildings will be 2 to 3 people for one day every month.

The predicted irregular foul loading due to the sporadic occupancy of the buildings creates unsuitable conditions for a wastewater treatment system. It is proposed therefore to pipe the foul water to a 5,000L tank for temporary holding storage. A maintenance agreement will be entered with a suitably licensed waste contractor for periodic (3 months) emptying of this tank. The maximum predicted flow into the tank every 3 months is:

- 3 people x 100 l/person/day = 300 l/day.
- 300 (1 day every 4 weeks) x 12 weeks = 900 litres.

Therefore, a 5,000-litre tank that will be emptied every 3 months will provide ample capacity to store the foul water. There will be no foul water discharges arising from the Proposed Development.

### **3.1.4 Earthworks**

The proposed 110kV substation will be developed on ca. 1ha within the overall ca. 2ha Site. These works will require the importation of engineering fill materials to raise site levels by ca. 1m over a total area of ca. 17,668 m<sup>2</sup> as follows:

- Proposed 110kV substation area measuring 10,191 m<sup>2</sup>; and,
- The extension over the fence area measuring 7,477 m<sup>2</sup>.

The detailed design will determine the extent of the earthworks required; however, it is known that the proposed 110kV substation will comprise a concrete foundation for the transformers and electrical equipment, with the rest of the area filled with crushed rock.

Any earthworks required for the Proposed UGC will be backfilled using suitable excavated material, with surface levels reinstated to match the surrounding ground profile.

The remainder of the Site is reserved for future expansion works, as specified by EirGrid. This identified expansion area is currently subject to seasonal groundwater emergence, which can result in localised flooding during periods of a high-water table. The required ground levelling works would not result in any adverse effects on surrounding land, drainage patterns and groundwater conditions, and would be fully integrated with the overall surface water management approach for the Site.

### **3.2 Specialist Ecological Input / Sensitive Design**

Specialist ecological input was a key element of the design of the Proposed Development. This ensured that the design was sensitive to valued ecological features that occur or may occur within the Site and the surrounding landscape. The key sensitive design measures are as follows:

- The Proposed Development will use the approved access arrangements as per the Permitted Development, which utilises the existing Lisheen Mine Complex access point;

- Buffers will be implemented and maintained throughout the lifecycle of the Proposed Development, including:
  - A >1km buffer between the Proposed Development; and any designated European site;
  - A >40m buffer between the Proposed Development and all EPA-designated watercourse;
  - A ca. 6m buffer between the Proposed Development and existing hedgerows / treelines; and,
  - A minimum ca. 200m buffer between likely acoustic emission infrastructure associated with the Proposed Development, and sensitive residential dwellings.

### 3.3 Construction Procedures

During the Construction Phase, the methods of working will comply with all relevant legislation and best-practice guidelines to reduce the environmental adverse effects of the works. Although Construction Phase adverse effects are generally of a short-term duration and are localised in nature, the adverse effects will be reduced as far as practicable through compliance with current construction industry guidelines.

There will be a single construction programme for the Permitted Development and the Proposed Development.

A Construction Environmental Management Plan ('CEMP') will be prepared and submitted to the planning authority by the appointed contractor in advance of works commencing at the Site. The pCEMP will be a 'living document', and the final CEMP will be issued by the appointed contractor prior to construction commencing. The following guidance will be referred to and will be followed during the Construction Phase of the project to prevent environmental pollution that may occur:

- C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [10];
- C811 - Environmental Good Practice on Site (5th edition) [11];
- C648 - Control of Water Pollution from Linear Construction Projects: Technical Guidance [12];
- Guidance for the Treatment of Otters Prior to the Construction of National Road Schemes [13];
- All works will be undertaken in accordance with the Inland Fisheries Ireland ('IFI') '*Requirements for the Protection of Fisheries Habitat during Construction and Development*' [14];
- The recommendations included within the National Roads Authority ('NRA') Guidelines for the crossing of watercourses [15]; and,
- NRA, 'Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads' [16].

The following measures will be incorporated and adhered to in order to ensure that the proposed works do not result in any contravention of wildlife legislation:

- All activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The measures detailed within this report will be fully adhered to;

- In advance of works, all Site personnel will receive an induction which will include reference to measures in relation to protected species and measures to prevent the spread of invasive species;
- Should construction works be required outside of daylight hours, the appointed project Ecological Clerk of Works ('ECoW') will be consulted as required; and,
- If protected or notable species are encountered during operations at the Proposed Development, the ECoW will be contacted for advice.

### **3.3.1 UGC Construction Methodology**

The UGC ducts will be installed and the trench reinstated in accordance with the landowner's requirements, where installed on private lands. The installation of the electrical cabling / fibre cable will be pulled through in some sections. Construction methodologies to be implemented and materials to be used will ensure that the UGC is installed in accordance with the requirements of the Council and private landowners.

### **3.3.2 Hours of Work**

Working hours will generally be restricted to between 08:00 and 20:00 hours Monday to Friday inclusive and between 08:00 and 18:00 hours on Saturdays. Construction work will not be permitted on Sundays, public holidays or at night-time except where safety concerns necessitate it or if agreed in advance with the Planning Authority.

### **3.3.3 Temporary Construction Compound**

Given that the Overall Development will be constructed as a single construction project, the secure construction compound will be established in accordance with the arrangements approved under the Permitted Development. Tipperary County Council previously granted the construction compound permission as part of the Permitted Development, and no change to its location or extent is proposed.

All materials for the construction of the Proposed Development will be deployed and stored within a temporary construction compound. All equipment and materials unloaded in the construction compound would be distributed throughout the Site using smaller machines, such as bobcats, via a network of pre-existing hardcore tracks.

The Site Compound (including welfare areas) would be erected on existing hardstanding only. No earthworks or sub-surface disturbance will occur as part of these proposed facilities.

The compound will operate as a secure, designated area and will be located away from any drainage ditches, watercourses, or other sensitive environmental receptors. This arrangement will ensure that construction activities are appropriately managed and that potential risks to the surrounding environment are avoided.

### **3.3.4 Waste Management – Construction**

- All excavated materials within the Site will be reused onsite, where possible. Excavated material from the UGC shall be employed to backfill the trench where appropriate, and any surplus material will be transported off-site and disposed of at a fully authorised soil recovery site;
- Waste materials will be collected and stored in suitable receptacles before they are taken off site;
- Waste materials will not be allowed to accumulate because of the fire / vermin risk; and,

- All wastes will be appropriately segregated with the objective of maximising the level of recycling.

### **3.3.5 Monitoring Works.**

An ECoW will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works to ensure that they are completed in line with the measures detailed within this WFD accompanying an Environmental Report ('ER'), along with the Appropriate Assessment ('AA') and CEMP, that are submitted as part of this application, and all wildlife legislation.

The ECoW will either deliver the Site induction directly or provide the resident engineer with sufficient environmental information to ensure that a comprehensive Site induction is delivered to all personnel working on-site.

## **3.4 Operational Procedures**

Once operational, significant maintenance works will not be required. The Proposed Development will be an unmanned facility, which will be remotely monitored by way of CCTV. Any fault flagged on the control system will be inspected by maintenance personnel or dealt with remotely if possible. All on-site systems will be automated, with remote access provided to the control building.

The Proposed Development will require as low as one maintenance visit per month to undertake routine, non-intrusive maintenance tasks such as Site inspection, cable and power plant checks and servicing. Only small vans / jeeps will be used to access the Site.

The transformer units will contain oil that will be banded. Under normal operation, this oil is maintained within the system, and no emissions will occur. To prevent unforeseen impact on the environment, the transformer and step-up transformer units will be monitored and maintained.

### **3.4.1 Waste Management**

There will be no operational waste associated with the Proposed Development, with the exception of the foul wastewater that will need to be removed periodically from the storage tank by a licensed contractor. The Decommissioning Plan, prepared as part of the overall planning application, addresses all aspects of waste management during the Operational Phase.

## **3.5 Decommissioning**

The operation of the facility will be for approximately 40 years, as determined by the grant of planning. At this time, a decision will be made as to whether the Permitted Solar Development that will be connected to the Proposed Development will be decommissioned or repowered. If the decision is taken to decommission the Permitted Development, then the Proposed Development will also be decommissioned, and the Site will return to agricultural usage. However, if the solar farm were to be repowered, then the Proposed Development would remain in use.

It is intended that there will be a single decommissioning programme for the Permitted Development and the Proposed Development.

The decommissioning tasks and removal of all solar farm components from the leased land will be completed within twelve months of the cessation of electricity generation by the solar farm, and the Site shall be reinstated to its former use.

At the end of the Proposed Development's lifetime, the substations will be completely dismantled (including underground electrical interconnection and distribution cables), and the Site will be restored to its preconstruction state.

The Decommissioning Plan addresses all aspects of waste management post-Operational Phase. The Applicant will re-use or recycle as many of the substation's components as reasonably practicable. All residual waste will be removed by a licensed contractor and transported to a licensed waste facility.

Given the nature of the Proposed Development and the small amount of infrastructure required, it is considered highly unlikely that any adverse effects would occur as a result of decommissioning works. However, decommissioning works will have to be carried out in accordance with best practices and any legislation applicable at the time of decommissioning.

Full details of the decommissioning works are included within the 'Decommissioning Plan' submitted as part of the overall planning application.

## 4 STUDY AREA SCREENING

For the purposes of screening, information available on or through the EPA maps [17] and the Geological Survey Ireland ('GSI') Spatial Resources maps [18] was utilised throughout. A study area of 2km was assessed in line with the Institute of Geologists of Ireland ('IGI') guidelines for the preparation of soils, geology and hydrogeology chapters of Environmental Impact Statements [19] and by using professional judgement. Protected sites within the 2km study area were assessed.

### 4.1 Surface Water

According to EPA Maps [17], the Site and the study area are entirely within the Suir Catchment (Catchment ID: 16). The Site and the majority of the study area lie within the Suir\_SC\_040 WFD Sub-catchment (Catchment ID: 16\_12), the northwest portion of the study area lies within the Suir\_SC\_010 WFD Sub-catchment (Catchment ID: 16\_22) [17].

The Cooleeny Stream is the closest hydrological feature in the vicinity of the Site. It is located ca. 40m to the south of the Site, at its closest point. This stream flows in a southern direction before flowing southwest and draining into the River Drish 16 ca. 4km downstream of the Site. Both the Cooleeny Stream and the River Drish 16 are part of the Drish\_040 river waterbody (EU Code: IE\_SE\_16D020100). The Drish\_040 river waterbody is classified as having "moderate" status and is "at risk" of not meeting the WFD objectives [17].

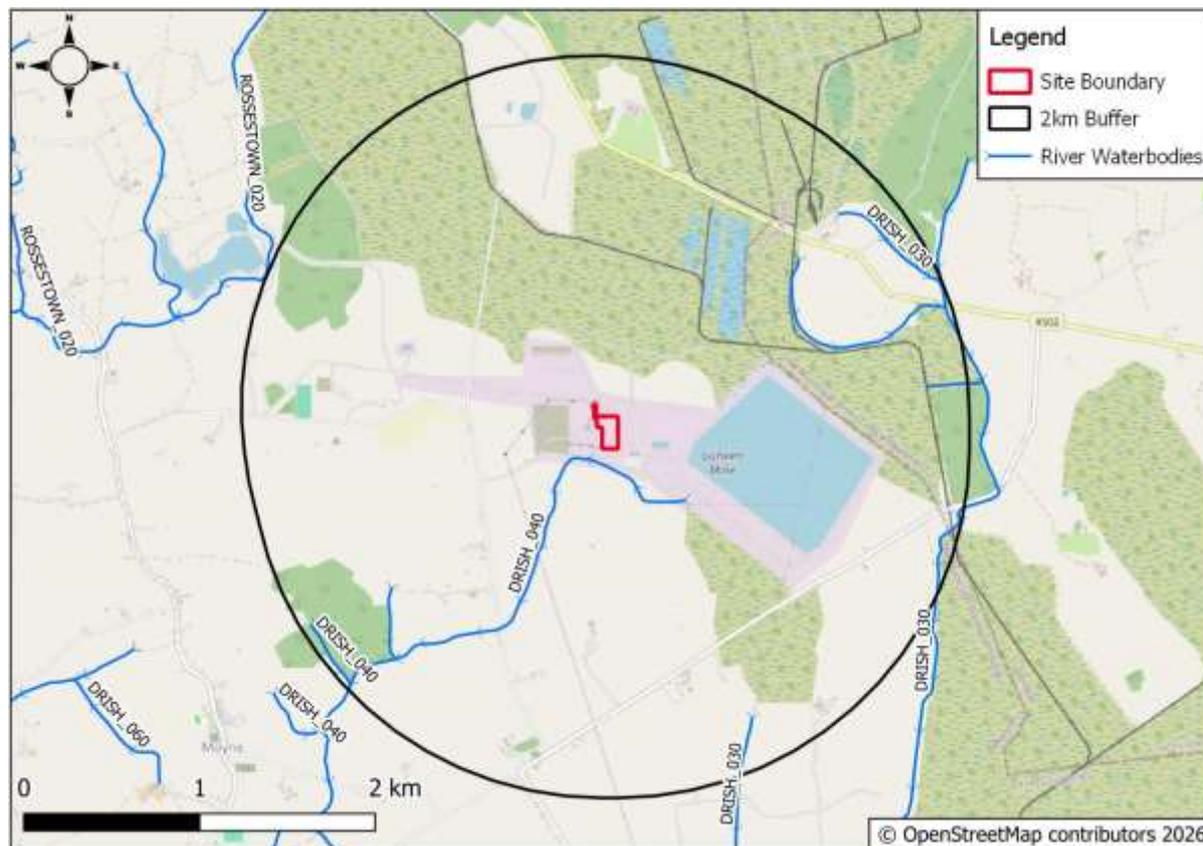
The Drish\_030 river waterbody is located ca. 1.16km northeast of the Site and flows to the south. The Drish\_030 river waterbody is classified as having "poor" water status and is "at risk" of not meeting the WFD objectives [17].

The Drish\_040 river waterbody is not hydrologically connected to the Site. The Drish\_030 river waterbody enters the Drish\_040 river waterbody ca. 2.9km south of the Site. As such, it is hydraulically upgradient of the Site and is not hydrologically connected to the Site. There are no potential effects on these waterbodies as a result of the Proposed Development in the absence of a connection between these waterbodies and the Site.

Figure 4-1 below shows these surface waterbodies in relation to the Site. Details of these waterbodies are shown in Table 4-1 below.

There are no other surface waterbodies within the study area. Refer to the screening summary table presented in Table 4-6 and the impact assessment presented in Section 5.

**Figure 4-1: WFD Surface Waterbodies**



**Table 4-1: Summary of Surface Waterbodies Within the Study Area**

WFD Catchment	WFD Sub-Catchment	Waterbody Name	Waterbody Type
Suir	Suir_SC_040	Drish_030	River
Suir	Suir_SC_040	Drish_040	River

## 4.2 Groundwater

The bedrock aquifer underlying the Site and the majority of the study area is classified as a Regionally Important Aquifer – Karstified Diffused Bedrock (Rkd). This is a good aquifer and is capable of supplying regionally important supplies, e.g. large public water supplies. A Locally Important Aquifer – Bedrock, which is Generally Moderately Productive (Lm), bedrock aquifer is located in the north and south of the study area. A small area to the north of the Site is classified as a Locally Important Aquifer – Karstified (Lk) bedrock aquifer. There are no sand and gravel aquifers within the study area.

All bedrock aquifers within the study area are associated with the Thurles (IE\_SE\_G\_158) groundwater body ('GWB'). This GWB is classified as having 'good' status and is 'not at risk' of not meeting the WFD objectives [17].

Groundwater flow within the GWB is likely to be from northeast to southwest. Flow is likely to occur through fractures which have been enlarged by karstification and dolomitisation [20]. The bedrock aquifer corresponds with the Waulsortian Limestones mapped in the area. This is confirmed by the site investigation carried out in the adjacent Glanbia Ireland DAC site (Tipperary County Council planning ref 18601296) [21], which shows the presence of black to light brown, weathered Limestone overlying black to white competent limestone. The

boreholes were screened within the competent limestone, and water strikes were encountered between 3.8 ('mbgl') and 9.8mbgl.

Groundwater levels recorded on seven occasions between 4<sup>th</sup> September 2018 and 30<sup>th</sup> September 2019 showed groundwater levels between 0 and 5.2mbgl. Artesian conditions, i.e. where the groundwater level is above the ground level, were encountered in GW2 adjacent to the Site, specifically the southeast corner of the Site. This data is backed up by photos of the Site, which show groundwater flooding in the southern area of the Site, which is reserved for future expansion works. It was noted that, based on these photos and a topographic survey carried out in 2025, groundwater flooding does not occur in the northern area of the Site where the Proposed Development is located.

Subsoil permeability and groundwater vulnerability across the Site and the majority of the study area are both classified as 'moderate' [18]. This indicates a subsoil thickness of more than 10m in these areas. However, based on site investigation in the Glanbia Ireland DAC (Tipperary County Council planning ref 18601296) [21], the subsoils are between 0.3 and 0.7m thick and clay in nature, indicating thin, low-permeability subsoils. This would change the site-specific groundwater vulnerability rating to 'Extreme' or 'Rock at or Near Surface'.

The Site is directly hydrogeologically connected to the underlying GWB.

Figure 4-2 below shows the GWBs within 2km of the Site.

**Figure 4-2: Groundwater Bodies**



### 4.3 Groundwater Usage

A search of the GSI groundwater wells and springs database was conducted, which identified 59 wells within 2 km of the Site. This database is dependent on GSI drilling and data submitted to the GSI from Local Authorities, other state bodies, private well grants, drillers, consultants, group water schemes and academia. It is not a comprehensive database, and many wells and

springs are not included. The features listed on the well and springs database are summarised as follows:

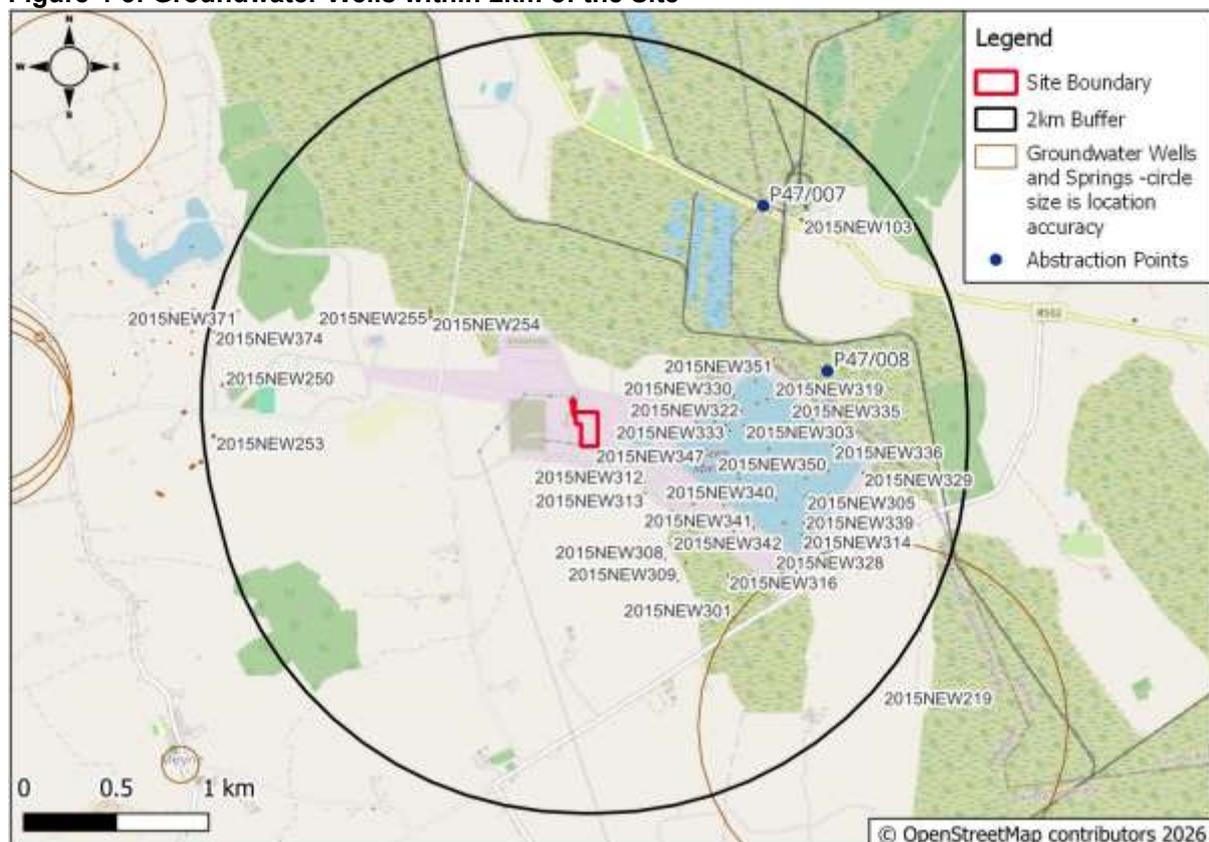
- One dug well with a depth of 2.9mbgl, is used for agricultural purposes only. The yield of this well is unknown;
- 58 borehole wells, two of which are used for agricultural and domestic use. The yield for one of these wells is unknown, the other has a yield of 32.7m<sup>3</sup>/d;
- The other 56 borehole wells have an unknown use. The yields of 52 out of these 56 wells are unknown. The yields of the remaining four wells range from 256m<sup>3</sup>/d (classed as good) to 6,725m<sup>3</sup>/d (classed as excellent); and,
- There are no springs mapped within 2km of the site.

The locations of the identified wells and springs features are presented in Figure 4-3. The location accuracy is visually portrayed by the size of the circle displaying the record. Smaller circle sizes reflect a higher accuracy of the location of that feature.

It was noted that the majority of the listed groundwater well use is recorded as unknown. It is likely that the wells located to the east of the Site are predominantly associated with past mining activities and the former TMF.

The nearest abstraction, which is registered with the EPA, is a drainage point owned by Bord na Mona Energy Limited. This abstraction is located ca. 1.25km east of the Site and abstracts a maximum of 20m<sup>3</sup>/d.

**Figure 4-3: Groundwater Wells within 2km of the Site**



Groundwater sources for public water supplies, group water schemes and industrial abstractions are of critical importance in many regions. The objective of a Source Protection Area is to provide protection for the supply by placing tighter controls on activities within all or

part of the delineated source protection area. Zones of Contribution ('ZOCs') are delineated areas which contribute groundwater to a borehole or spring.

There are no public water supplies or private group water schemes within the study area. The nearest groundwater-derived drinking water source is the Baunmore group water scheme, located ca. 2.9 km to the east-northeast of the Site. This group water scheme is upgradient of the Site and hence is not connected to the Site.

The abstraction point for the Moyne Group Water Scheme is located ca. 5.5km south-southwest of the Site, and the outer protection zone extends to 4.1 km south of the Site. The Moyne Group Water Scheme currently serves the National Bioeconomy Campus and a supply pipe runs along the western and southern boundaries of the Site. However, the Site remains unconnected to the abstraction point and the delineated source protection area for the Moyne Group Water Scheme through different geology at both sites, as well as a topographic divide.

#### 4.4 Water Pressures

The EPA has identified significant pressures for waterbodies that are "At Risk" of not meeting their water quality objectives under the WFD. Significant pressures are those pressures which need to be addressed in order to improve water quality. From the data presented on the EPA maps, there are water pressures identified for three waterbodies within the 2km study area, summarised in Table 4-2 below.

**Table 4-2: EPA Water Pressures on Waterbodies within study area**

Waterbody Name	Waterbody Type	Water Pressure
Drish_030	River	Extractive Industry
Drish_040	River	Extractive Industry

#### 4.5 Protected Sites

##### 4.5.1 European Designated Sites

There are no European-designated (Natura 2000) sites within the study area. Additionally, in the absence of a hydrological connection, there are no Natura 2000 sites connected to the Site outside of the study area.

##### 4.5.2 Nationally Designated Sites - Register of Protected Areas

There are no Shellfish Areas, Salmonoid Rivers, Nutrient Sensitive Area ('NSA'), waterbodies identified as drinking water resources, proposed Natural Heritage Area ('pNHA') or National Heritage Areas ('NHA') within the study area.

In the absence of a hydrological connection, there are no Nationally Designated Sites connected to the Site outside of the study area.

#### 4.6 Other Facilities/ Developments

Based on EPA maps [17], there are two facilities / developments within 2km of the Site which hold EPA-issued licenses or other types of permits:

- Lisheen Milling Limited holds an IPC Industry license, Active License Number P0088-04, and is situated ca. 100m west of the Site; and,
- Lisheen Renewable Energy Limited holds an IPC Industry license, Active License Number P1199-01, and is situated ca. 2km north of the Site.

The main potential cumulative effect that required assessment was associated with the consented Solar PV Farm development to the east of the Site (Planning Ref.: 21/1128), which has yet to be constructed.

#### 4.7 Screening

Given the pressures and the presence of, or lack of, a hydrological connection between the Site and the waterbodies discussed above, waterbodies can be categorised into either requiring further assessment or not requiring further assessment; see Table 4-3 below.

No hydrological connection was identified between the Site and the surface waterbodies within the study area. Hence, both the Drish\_030 and the Drish\_040 river waterbodies have been screened out.

Based on the absence of any notable pluvial or fluvial flood risks on the Site or in the immediate vicinity of the Site, as well as the fact that the neighbouring solar development would be considered to be a water-compatible development, it was not predicted that the Proposed Development will result in any significant cumulative effects in relation to pluvial or fluvial flooding. Additionally, the Proposed Development was not predicted to have any significant cumulative effects on groundwater flooding.

The ground levels across the Site will be raised by ca. 1m with imported engineering fill materials. Existing ground level of approximately 127.3 m will be raised to a finished floor level of approximately 128.3m. Furthermore, within the expansion area, existing ground level of approximately 126.3 m will be raised to a finished level of approximately 127.3 m. This will ensure that all the lands within the redline boundary will be significantly above the high winter water table. The importation of this material may have an effect on the water quality of the underlying aquifer, as well as recharge rates to the aquifer.

In the case of the Thurles GWB, underground cable trenches and cabling connecting the proposed on-site 110kV substation to the existing Lisheen 110kV substation will also be undertaken. The excavation works required for this will be carried out after ground levels are raised. In the unlikely event that groundwater is encountered in excavations, limited and temporary dewatering may be required.

No impacts or significant effects from the Proposed Development are predicted on any water schemes, including the Moyne Group Water Scheme.

**Table 4-3: Screening Table**

Name	Ecological Status / Potential	Risk	Further Assessment	Justification
<b>River Waterbodies</b>				
Drish_040 river waterbody	Moderate	At Risk	No	The Site is within 40m of Cooleeny Stream (i.e. the Drish_040 river waterbody) but is not hydrologically connected to this river waterbody.  The Proposed Development is not predicted to have any effects or contribute to any significant cumulative effects regarding surface water flooding.
<b>Groundwater Bodies</b>				

Name	Ecological Status / Potential	Risk	Further Assessment	Justification
Thurles	Good	Not at risk	Yes	<p>The Thurles GWB is directly hydrogeologically connected to the Site.</p> <p>There is a UGC from the Proposed Development to an ESB substation which, during the Construction Phase, may have an impact on groundwater quality.</p> <p>Additionally, the importation of engineering fill materials to raise the ground level may have a localised impact on groundwater quality.</p> <p>The Proposed Development will not have any effects or contribute to any significant cumulative effects regarding groundwater flooding.</p>

## 5 IMPACT ASSESSMENT

### 5.1 Groundwater Bodies

**Table 5-1: Thurles Groundwater Body**

Receptor	Potential Impact from Site	Potential Impact of Proposed Development	Mitigation Required?
Quantitative Quality	No	<p>Site levels will be raised using only imported engineered fill, given the permeable nature of these materials, they will not have an impact on the recharge rate to the aquifer in the area of the Site.</p> <p>Mitigation measures will be required to ensure this will not have an impact or lasting effect on the GWB associated with the construction or the operation of the Proposed Development.</p>	Yes
Physio-Chemical quality	Yes	<p>The engineered fill material to be imported to the Site to raise ground levels will not act as a protective layer over the aquifer, hence the groundwater vulnerability rating at the Site will remain as 'Extreme' or 'Rock at or Near Surface'.</p> <p>The use of on-site machinery during the Construction Phase of the Proposed Development presents a hazard to the underlying GWB quality, primarily from the fuels and hydrocarbon oils utilised by machinery. A spill or release of hydrocarbons onsite could potentially result in a negative effect to the quality of the GWB. The risk for such an event to occur would remain until the completion of the construction works. As such, mitigation will be required to reduce the risk of such a spill or release from occurring to an acceptable level. Additionally, mitigation will be implemented to provide measures that will limit the magnitudes of any impacts should such a spill or release occur.</p> <p>Mitigation measures will be required prevent any magnitude of effects on the GWB associated with the Proposed Development.</p>	Yes

## 5.2 Mitigation Measures

### 5.2.1 Construction Phase

The majority of the construction activities associated with the Proposed Development will be undertaken ca. 150m from the Cooleeny Stream, part of the Drish\_040 river waterbody. There is no existing drainage connection in place that connects the Site to this river waterbody that could provide a conduit to the river waterbody during construction activities. There will be an existing access road separating these works from the river waterbody. In summary, it was predicted that the potential impacts on the Drish\_040 river waterbody during the Construction Phase will be not likely and not significant.

The proposed 110kV substation will be developed on ca. 1 ha within the overall ca. 2ha site. The levels in this portion of the Site will be raised by ca. 1m with imported engineering fill materials. Existing ground level of approximately 127.3 m will be raised to a finished floor level of approximately 128.3m. Furthermore, within the expansion area, existing ground level of approximately 126.3 m will be raised to a finished level of approximately 127.3 m. This will ensure that all the lands within the redline boundary will be above the high winter water table.

Underground cable trenches and cabling connecting the proposed on-site 110kV substation to the existing Lisheen 110kV substation will also be undertaken. Any earthworks required for the Proposed UGC will be backfilled using suitable excavated material, with surface levels reinstated to match the surrounding ground profile.

Excavation works for placing cables will occur after ground level have been raised by the imported engineered fill material. In the unlikely event that groundwater is encountered during the excavation works, limited and temporary dewatering may be necessary. However, given the project's scale, scope, duration and location, substantial dewatering is not anticipated, and any localised dewatering effects on groundwater will likely be imperceptible.

The Construction works will need to be very carefully planned, as during the winter months, they will potentially be located adjacent to an area of exposed groundwater. In the event there was any spillage from the construction works that migrated into this area, it would have the potential to have a direct negative effect on the underlying aquifer. All construction works will be undertaken in accordance with recognised best practice guidance. Nonetheless, mitigation measures will be put in place as part of the Site-specific CEMP to minimise the potential risk to groundwater quality associated with the Construction Phase of the Proposed Development.

The following mitigation measures will be implemented through the Site-specific CEMP to ensure that water quality is protected within the vicinity of the Proposed Development. These measures will include the following:

- All materials shall be stored at the contractor's compounds and transported to the works zone immediately prior to construction;
- Excavations will be left open for minimal periods to avoid acting as a conduit for surface water flows;
- No surface water runoff will be discharged onto public roads, foul sewers or adjacent property;
- Weather conditions will be considered when planning construction activities to minimise the risk of runoff from the Site;
- Provision of exclusion zones and barriers between any stockpiled materials and any surface water features to prevent sediment washing into the receiving water environment;

- An Environmental Clerk of Works shall be engaged to periodically inspect all elements of the works for their entire duration;
- Emergency response procedures will be put in place;
- Chemicals used will be biodegradable where possible;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Adequate spill kits, including absorbent booms and other absorbent material, will be maintained on site;
- All contractor workers will be appropriately trained in the use of spill kits;
- Any spillage of cementitious materials will be cleaned up immediately;
- Silt fences will be installed on the southern perimeter of the Proposed Development area of the Site to ensure that any potentially contaminated runoff from the northern area of the Site won't enter the groundwater / bedrock aquifer in the southern area of the Site, where extreme groundwater vulnerability conditions are present;
- Any sediments adversely affected by contamination will be excavated and stored in appropriate sealed containers for disposal off-site in accordance with all relevant waste management legislation;
- The working area will be clearly defined, and construction activities will be carefully planned to minimise ground disturbance;
- Stockpiles of material will be covered during periods of prolonged or heavy rain;
- Concrete pours for equipment plinths will be adequately planned and executed;
- Any pouring of concrete will only be carried out in dry weather. Washout of concrete trucks will not be permitted on site;
- Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
- Surplus concrete will be returned to the batch plant or off-site concrete wash facility after completion of a pour;
- Any spillage of cementitious materials will be cleaned up immediately; and,
- Washouts of equipment used for concrete operations will be done either off-site or within a designated washout area, which will comprise a container that will capture the washout material / water for disposal off-site.

The proposed measures to remove the risk of potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below.

These procedures will be communicated to all relevant site staff. At a minimum, the following measures will be in place:

- Any chemical / oils to be stored on site will be placed within a bund on an area of hardstanding to ensure there is no seepage of pollutants into groundwater or surface water;

- All bunds will have the capacity of the largest tank volume plus 10 percent, at a minimum, with additional capacity to hold 30mm of rainfall;
- All drainage from bund areas will be directed to secure containment prior to suitable disposal;
- Fuelling, refuelling and lubrication of equipment will be carried out off-site;
- All plant and machinery will be serviced before being mobilised to the Site;
- No vehicle or equipment maintenance work will take place on site;
- Appropriate containment facilities will be provided to ensure that any spills from vehicles are contained and removed off-site. Adequate stocks of absorbent materials, such as sand or commercially available spill kits, shall be available;
- The Contractor shall ensure that all personnel working onsite will be trained in pollution incident control response;
- A regular review of weather forecasts for heavy rainfall events will be undertaken with works scheduled accordingly;
- No storage of hydrocarbons or any polluting chemicals will occur within 5m of watercourses or surface water features;
- Design and installation of fuel bowsers to be in accordance with best practice guidelines;
- Drip trays and spill kits will be kept available on site;
- Cabins, containers, workshops, plant, materials storage and storage tanks shall not be located within 20m of any watercourse;
- Measures will be implemented to minimise waste and ensure correct handling, storage, and disposal of waste;
- Fuel and oil stores, including tanks and drums, will be regularly inspected for leaks and signs of damage; and,
- Drip trays will be used for fixed or mobile plant, such as pumps and generators, in order to retain oil leaks and spills.

The contractor will undertake periodic visual monitoring during construction to ensure the above measures are effective.

Additionally, the contractor will maintain a drainage inspection regime to ensure there is no negative impact to the drainage patterns at the Site.

### **5.2.2 Operational Phase**

Once operational, the development will receive monthly maintenance visits. Should any unforeseen issues with equipment and / or holding tank occur, they will be detected at an early stage, and remedial measures will be implemented accordingly in order to protect receiving waters.

### **5.2.3 Decommissioning**

The Proposed Development will have a lifespan of 40 years at which time the Proposed Development will be decommissioned, and the Site returned to its current use. Upon decommissioning, the same measures will be applied as during the Construction Phase. After removal of the infrastructure, the Site will be inspected.

Mitigation measures outlined above will minimise the identified potential risks to soils and water quality associated with the Operational Phase of the Proposed Development.

## 6 CONCLUSIONS

The Site has a direct hydrogeological connection with the underlying Thurles groundwater body. Surface waterbodies within the study area were screened out due to a lack of a hydrological connection between them and the Site.

Without mitigation, it was predicted that the Proposed Development could have a negative effect on the above waterbody, specifically, should an unplanned spill of hydrocarbons or release of suspended solids occur during the Construction Phase. Robust mitigation measures will be implemented as part of the Proposed Development in order to manage the risk of such an event from occurring and to limit any effects arising from such an event. With mitigation, these effects will be imperceptible, localised and without an impact or lasting effect on the overall quality status of the waterbody.

As such, it can be concluded that the Construction and Operational Phases of the Proposed Development will not:

- Jeopardise the achievement of:
  - good quality status;
  - good chemical status; or,
  - good ecological potential.

for any directly or indirectly connected groundwater or surface waterbody;

- Contribute to the risk of any directly or indirectly connected waterbody from failing to achieve and / or maintain at least “good” status within the next cycle of the Water Framework Directive monitoring;
- Degrade the ecological quality of the protected sites associated with connected waterbodies, nor jeopardise the goals and / or targets set out for these protected sites; or
- Have any likely significant effect on any European site or other protected area.

Therefore, the Proposed Development will not compromise the objectives and requirements of the WFD within the local area and within the river basin district. It will not result in the deterioration of any waters such that they will be unable to meet the objectives of the WFD and transposing legislation.

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