Kildavin Waste Water Treatment Plant Upgrade

RE: Application for Derogation under Article 54 of the European Communities (Birds and Natural Habitats) Regulation 2011-2021, relating to disturbance to otter and bats.

FOR: Uisce Éireann (UE)

LICENSEE NAME: APPOINTED by UE (TBC)

SCIENTIFIC AGENT: APPOINTED by UE (TBC)

DATE OF APPLICATION: 05.02.2025

Document no: 0
Version: 0.0

Uisce Éireann
[Client reference]

Kildavin Waste Water Treatment Plant Upgrade
5 February 2025

Kildavin Waste Water Treatment Plant Upgrade

Client name:	Uisce Éireann		
Project name:	Kildavin Waste Water Treatment Plant Upgrade		
Client reference:	*[Client reference]*	**Project no:**	321084AH
Document no:	0	**Project manager:**	Niall Kennedy
Version:	0.0	**Prepared by:**	Samuel Warden
Date:	5 February 2025	**File name:**	Kildavin Licence Report For Submission.docx
Document status:	Draft		

Document history and status

Version	Date	Description	Author	Checked	Reviewed	Approved
0.0	05/02/2025	Draft	SW	StC	SC	

Jacobs Engineering Ireland Limited

Termini Building, 2nd Floor
3 Arkle Road
Sandyford
Dublin
D18 C9C5
Ireland

T +353 (0)1 269 5666
www.jacobs.com

Contents

Appendices

1. Introduction

1.1 Licence Application

Otter (*Lutra lutra*) and all species of bats (excluding lesser horseshoe (*Rhinolophus hipposideros*), which are additionally listed on Annex V) are listed on Annex IV of the EU Habitats Directive. The directive has been transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) as amended. The Habitat Regulations, 2011- 2023, gives strict protection to individual otters and their breeding and resting places (holts and couches), and individual bats and their roosts.

Otter and bat species (with the exception of common pipistrelle (*Pipistrellus pipistrellus*) which is Appendix III) are also on Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats which also gives strict protection to otter and bat species. Otter is also listed in the Convention on International Trade of Endangered Species (CITES). Otters and their habitats are also protected under the Wildlife Act, 1976, as amended by the Wildlife Act (Amendment).

Construction works associated with the Kildavin Water Treatment Plant Upgrade have the potential to cause disturbance to foraging otter and roosting bats. The location of the relevant part of works and the field signs of otter and a potential bat roost are shown on Figure 1. This application is for derogation under Article 54 of the Habitat Regulations, 2011-2023, in relation to disturbance to otters and their habitats and disturbance to bats in their roost. As the disturbance related to this license application is focused on the outfall location, the below Figure 1.1 shows this area and all relevant field signs found on survey.

Figure 1.1. Otter (potential and confirmed) spraints and slides Target Notes 2-4. Target note 1 is location of low-moderate bat roost potential. Proposed outfall location shown in blue.

1.2 The Proposed Project

The Kildavin Wastewater Treatment Plant (WwTP) is located 23 km southeast of Carlow Town. The WwTP is located to the south of Kildavin village. Upgrades are required to the existing facility due to it being overloaded and not meeting its discharge targets to Uisce Éireann (UÉ) standards. As such this project is in the public's overriding interest.

The Proposed Project will include construction of a new storm tank, a new sludge tank, all associated pumps, laying of a new pipe in road and a new outfall headwall at a new primary discharge point on the River Slaney (Figure 1.2). This licence application is in relation to the proposed pipe laying and new discharge/outfall location along the River Slaney. Photographs of the site outfall location can be viewed in Appendix A, Photographs 1-10.

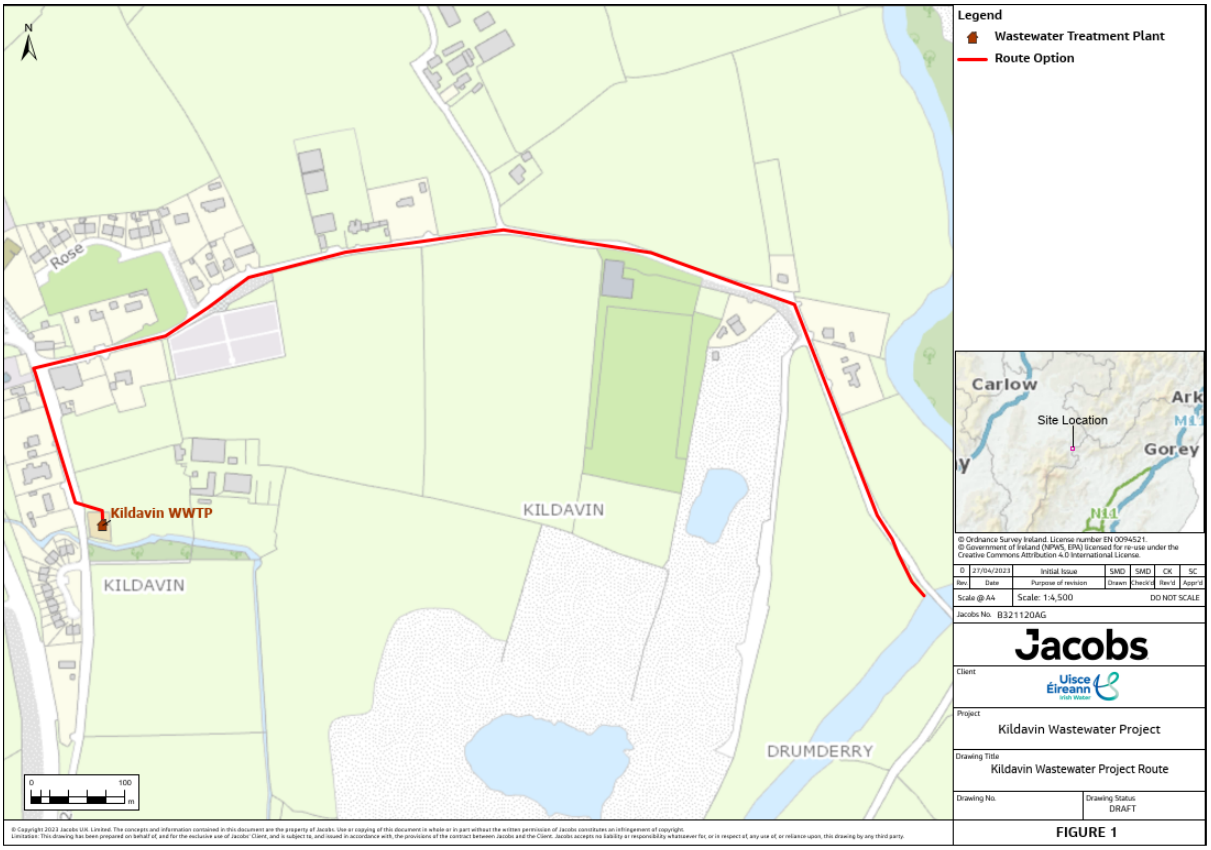

Figure 1.2 : Location and route of Proposed Development. The red line indicates the pipeline route, running from Kildavin WWTP to the proposed new outfall located on the riverbank of River Slaney.

1.3 Overview of the Proposed Works

Subject to the granting of statutory approvals, it is anticipated that the main construction phase will commence in Summer, 2026. Works on the water treatment plant itself and pipe-laying are anticipated to require 6 months to complete, whereas the placement of a pre-cast headwall and supporting works are anticipated to take 1 week to complete.

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). While no in-stream works are required, a dry works area will be formed adjacent to River Slaney to enable the installation of the headwall and pipe-laying. This period of work 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. The dry area will be created using steel sheet piles which will be pressed into place, creating an area of 5m x 2m. Given the scale of the sheet piling proposed, a Still Worker pile press will be utilised to minimise the noise and vibration produced in both installing and extracting.

The pipeline will be installed using open cut construction, via the following methodology:

- Earthwork Excavation

The trench will be excavated by suitable excavator plant and equipment with manual cleaning for the bottom of the trench. Where there is rock, a hydraulic hammer will be used. Where the excavated trench sides are unstable shoring will be provided. The trench will be excavated to the required formation level. The excavated soil will be segregated and stacked along the pipeline trench. The stack height will typically be 1.5m.

- Pipeline Installation

The formation level, or trench bottom, will be prepared. Trenches will be kept dry to allow proper and safe bedding, laying, jointing of pipes and construction of the selected stone fill to side and over the pipes. Pipelines will be laid in accordance with manufacturer's instructions.

Excavation works may involve localised dewatering of the excavation area to facilitate the works. Dewatering will only be carried out to the extent necessary to keep the excavation dry during the works. Discharge points/locations shall be agreed in advance with the Local Authority, including Inland Fisheries Ireland, for the discharge of dewatered material. Desilting measures will be put in place and monitoring procedures established.

Backfilling of the pipe trench will commence as soon as possible after the pipe has been laid and firmly bedded in. Backfilling will continue to the required height, and reinstatement carried out. The trenches on the agricultural land will be reinstated with an appropriate topsoil and reseeded to suit the existing conditions.

The agricultural land will be accessed via the existing L2027 local road. The working area will have a topsoil area stripped and temporary granular surface put in place to accommodate plant traversing the working area. Once the works are complete the topsoil will be appropriate replaced and reinstated. The pipelaying works will require excavation along the pipe length, requiring reinstatement of the ground conditions via reseeding. Reseeding will also be required in the area surrounding the proposed location of the pre-cast headwall.

1.3.1 Details of Works Close to Resting Places and Foraging Areas

The works with potential to disturb otter and bats are primarily the installation of the pre-cast headwall at the outflow location, and the easternmost section of the proposed pipe-laying adjacent to the pre-cast headwall.

For otters, the works will be carried out in the proximity of otter foraging habitat at the outfall location (S 89869 59694) (Figure 1). For bats, a low-moderate bat roost potential tree was identified adjacent to the outfall location (approximately 7m south at S 89895 59687).

The installation of the outfall will require a dry works area directly adjacent to the River Slaney, which was identified as foraging habitat for the species. This will involve the installation of sheet piles and potentially dewatering in the area, followed by the installation of a pre-cast headwall. A pipeline will be installed to this location via the methods previously described in Section 1.3.

No otter holts or resting places were identified within 1km downstream of the Proposed Works area or 100m upstream. Therefore, the only likelihood to disturbing otter is at its foraging location, not resting or breeding sites. In addition, the tree with bat roost potential is not planned for removal, and so disturbance is the only potential impact on any roosting bats.

2. Qualification as Scientific Agent

As the Scientific Agent, Jacobs Engineering Ltd. proposes to use a suitable ecological clerk of works (ECoW) as appointed by the contractor who will be experienced in ecology/otter/bat surveys and mitigation. The works as detailed below for creation of the dry works area and pipeline installation will be supervised by an experienced ecologist. Members of Jacobs Engineering Ltd. ecology team will provide technical assistance and support in the field as needed.

2.1 Licences held

Photography licence number 230/2023.

2.2 Qualifications of Jacobs Ecologists

Samuel Warden is an Ecologist and holds a 1st class honours degree in Biology from the University of Manchester. Sam is a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (QCIEEM). Sam is an experienced ecological consultant with six years' professional consultancy experience. He has undertaken ecological assessments and surveys on a variety of project types (e.g., road schemes, waste, water, and energy) involving survey, mitigation and enhancement across the UK and Ireland. He has held several protected species licences including: a National Park and Wildlife Services (NPWS) personal licence for bat derogation in 2023 and 2024 (Nos: DER/BAT 2023-137 and DER/BAT 2024-23), a NPWS licence to photograph or film wild bats (No: 237/2023) and a Department of Agriculture, Environment and Rural Affairs licence to hand search for smooth newts (No: SNP/3/23).

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

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 CIEEM (MCIEEM) 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 seventeen years of consultancy experience in aquatic and terrestrial ecology with over twenty years' experience of field surveys and environmental sampling techniques.

She holds or has held several protected species licenses including: a National Park and Wildlife Services (NPWS) licence for Stage 1 and 2 FWPM survey in the Owenriff catchment, a pan Scotland Scottish Natural Heritage freshwater pearl mussel licence and a pan England Natural England freshwater pearl mussel licence. She is also an accredited agent on FRC badger licence (No: 11167), pan Scotland great crested newt licence (No: 17473), pan Scotland otter licence (No:14385), AWPR red squirrel licence (No: 14465), AWPR badger squirrel licence (No: 17260), AWPR otter licence (No: 42522) and A68 Lintalee otter licence (No: 27991). She has experience in otter survey techniques identifying otter resting places, holts, couches and hovers, and identification of field signs such prints, spraints (droppings) and slides on several large-scale UK road schemes and was involved in the design of a replacement holt on the A9 dualling project. She has undertaken multiple otter surveys for Irish projects, including the Meath to Kildare Grid Upgrade, N2 Ardee to Castleblayney Road Scheme, Cork Line Level Crossing, N59 Road Scheme - Maam Cross to Bunakill, N69 Listowel Bypass and Foynes to Limerick (including Adare Bypass). She is an experienced Ecological Clerk of Works (ECoW) and Safepass card holder.

3. Survey Methodology

3.1 Relevant Legislation & Guidelines

3.1.1 Relevant Guidelines

Otters

- Chartered Institute of Ecology and Environmental Management (CIEEM) Guidance (CIEEM 2021; CIEEM, 2017)
- National Roads Authority (2008) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. National Roads Authority.
- Chanin P. (2003), Ecology of the European otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough,
- Chanin P. (2003), Monitoring the otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10. English Nature, Peterborough.
- Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland (2021) National Parks and Wildlife Service (NPWS). Department of Housing, Local Government and Heritage.
- Strict Protection of Animal Species (2021) National Parks and Wildlife Service Guidance Series 2. Department of Housing, Local Government and Heritage

Bats

- Chartered Institute of Ecology and Environmental Management (CIEEM) Guidance (CIEEM 2021; CIEEM, 2017)
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition) (Collins, 2023)
- Strict Protection of Animal Species (2021) National Parks and Wildlife Service Guidance Series 2. Department of Housing, Local Government and Heritage

3.1.2 Relevant legislation

Otters

Otters and their habitats are protected under the European and National legislation, including:

- *EU Habitats Directive (92/43/EEC)*
- *European Communities (Birds and Natural Habitats) Regulations, 2011 (hereafter referred to as the Habitat Regulations, 2011)*
- *Berne Convention on the Conservation of European Wildlife and Natural Habitats*
- *Convention on International Trade of Endangered Species (CITES).*
- *Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000.*

Otters are listed in Annex II and Annex IV of the Habitats Directive. Strict Protection is afforded to all Annex IV species under the Habitats Regulations, 2011.

As set out in Regulation 51 of the Habitat Regulations, 2011, it is an offence to do any of the following without first obtaining a derogation licence from the Minister in accordance with Regulation 54:

(a) Deliberately capture or kill any specimen of these species in the wild.

(b) Deliberately disturb these species particularly during the period of breeding, rearing, hibernation and migration.

(c) Deliberately take or destroy eggs of these species in the wild.

(d) Damage or destroy a breeding or resting place of such an animal, or

(e) Keep, transport, sell, exchange, offer for sale or offer for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive.

Undertaking any work which has the potential to capture or kill any specimen of a Strictly Protected species, or to disturb Strictly Protected species, or to take or destroy eggs of such a species, and for which a derogation licence has not been granted, may constitute an offence under Regulation 51 of the Habitat Regulations 2011.

As it is an offence under Section 51 of Habitat Regulations, 2011 and under Section 23 of the Wildlife Act to to kill an otter or to damage or destroy the breeding or resting place of an otter, a derogation licence must be obtained to prevent an offence being committed. A derogation licence to disturb breeding and resting places of otter may be granted if "there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species concerned at a favourable conservation status in their natural range" (Art. 16, Directive - 92/43 - Habitats Directive).

Bats

Bats and their habitats are protected under the European and National legislation, including:

- *EU Habitats Directive (92/43/EEC)*
- *European Communities (Birds and Natural Habitats) Regulations, 2011 (hereafter referred to as the Habitat Regulations, 2011)*
- *Berne Convention on the Conservation of European Wildlife and Natural Habitats*
- *Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000*.

All Irish bat species are listed in Annex IV of the Habitats Directive, whereas the lesser horseshoe bat is listed on Annex IV and II. Strict Protection is afforded to all Annex IV species under the Habitats Regulations, 2011.

As set out in Regulation 51 of the Habitat Regulations, 2011, it is an offence to do any of the following without first obtaining a derogation licence from the Minister in accordance with Regulation 54:

(a) Deliberately capture or kill any specimen of these species in the wild.

(b) Deliberately disturb these species particularly during the period of breeding, rearing, hibernation and migration.

(c) Deliberately take or destroy eggs of these species in the wild.

(d) Damage or destroy a breeding or resting place of such an animal, or

(e) Keep, transport, sell, exchange, offer for sale or offer for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive.

Undertaking any work which has the potential to capture or kill any specimen of a Strictly Protected species, or to disturb Strictly Protected species, or to take or destroy eggs of such a species, and for which a derogation licence has not been granted, may constitute an offence under Regulation 51 of the Habitat Regulations 2011.

As it is an offence under Section 51 of Habitat Regulations, 2011 and under Section 23 of the Wildlife Act to to kill a bat or to damage or destroy the breeding or resting place of a bat, a derogation licence must be obtained to prevent an offence being committed. A derogation licence to disturb breeding and resting places of bats may be granted if "there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species concerned at a favourable conservation status in their natural range" (Art. 16, Directive - 92/43 - Habitats Directive).

3.2 Desk Based Research and Data Sources

A desk-based review was conducted to inform baseline surveys for the Environmental Impact Assessment Report for the Proposed Development area. A search of the National Biodiversity Data Centre (NBDC) (accessed August 2022) returned records of European otters, within 2km of the Proposed Development.

3.3 Field Survey Method

On the 20th of March 2024 a walkover survey was carried out along the River Slaney in Kildavin, Co. Carlow. The survey was undertaken by two experienced Jacobs ecologists to characterise the watercourse approximately 1km downstream and 100m upstream of the proposed new outfall location. Signs of species found and the presence of habitats of conservation interest was noted. All data was collected electronically, and photographs were taken using an iPad.

The following data was collected:

- **River characteristics** - Surveyors walked the river from downstream to upstream, starting approximately 1km from the potential outfall location. Surveyors stopped every 100m to assess river characteristics, such as depths and width, the substrate and flow type, the left and right riverbank composition (Figure 2, Table 1, Appendix B; Table 2, Appendix C).
- **Habitat** - Habitat types in the proximity of the river were assessed. Surveyors checked if any Annex I habitats or Qualifying Interest (QI) habitats were present.
- **Protected species** - Checks for any signs of QI species, species of conservation interest or suitable supporting habitats present were carried out. Signs of protected species included footprints, mammal tracks, potential resting places (holts, couches and setts), trees with bat roost potential, and within the river itself, estimating the suitability for fisheries (specifically for lampreys and Atlantic salmon).
- **Invasive species** - Surveyors also checked for invasive species and where present extent of infestation and species was noted.

4. Survey Results

Potential mammal tracks, footprints and spraints were found along the left riverbank and within 20m from the river. These indicate mammal activity in the area, including otter foraging. In addition, one tree approximately 7m from the proposed outfall location was deemed to have low-moderate bat roost potential due to dense ivy. Both bat and otter results are displayed below in Table 4.1.

Table 4.1. Results of walkover survey relevant to this application

Target Note	Species	Grid Reference (ITM)	Description	Photograph
1	Bat	689844, 659729	Tree with low to moderate bat roost potential 7m from proposed outfall location	
2	Otter	689846, 659734	Potential otter spraint 4m from proposed outfall location	

3	Otter	689511, 659028	Potential, but unused otter slide 770m from proposed outfall location	
4	Otter	689465, 658891	Mammal – Potential slide and spraint of otters and track 910m from proposed outfall location	 

5. Examination of Impacts and Satisfactory Alternatives

5.1 Potential Impacts

Otters

The River Slaney is a Special Area of Conservation (SAC) (Slaney River Valley SAC – 000781), of which one of its QI species is otter. A Natura Impact statement (NIS) will be submitted separately to this licence application. During the field survey, two potential otter spraints and two potential otter slides were found. No potential holts or resting sites were found on site, so there is no likelihood of otter mortality or disturbance to their resting/breeding sites.

The section of river adjacent to the route was considered suitable for foraging and commuting otter, therefore, there is a likelihood of disturbing otters. No in stream works are proposed, however a dry works area will be formed directly adjacent to the river requiring sheet piling on the river bank. Therefore vibrations and noise from trench excavation, pipe installation, outfall installation, and sheet piling associated with the dry works area may disturb the species. This is considered a low level of disturbance as there is an abundance of alternate foraging/commuting area nearby to the site. This disturbance, despite being low, may cause otters foraging/commuting within the area to temporarily move to an alternate foraging site.

A pollution event via the works may cause direct impacts to otter as the works are directly adjacent to the River Slaney.

Bats

The tree found 7m from the outfall location was deemed to have low-moderate potential to house a bat roost. The tree was covered with ivy and was quite small (approximately 5 m tall and 40cm diameter at breast height). It had potential to be a day roost for a single bat, as it was not large enough to house multiple at one time. As the tree will not be directly impacted with the works, there is no likelihood of damaging a roost or resting site.

5.1.1 Disturbance

Otters

The River Slaney was determined to be suitable foraging/commuting habitat for otter, as evidenced by the potential slides and spraints found along the river. No breeding or resting sites were found on site 1km downstream or 100m upstream of the proposed outfall location.

Due to the proximity of the works to the watercourse there may be impacts on foraging/commuting otter due to disturbance. For example, sheet piling associated with the creation of the dry works area and trench digging causing vibrations and noise, potential dewatering of the dry works area, along with an increase in general activity on site, could cause disturbance impacts. Disturbance could result in avoidance of the area by otter affecting the distribution of otter in this area.

The Proposed Project construction works are temporary and will cause a low level of disturbance. There is a high likelihood that no disturbance of otters will occur, however if an otter is disturbed, there is an abundance of alternate foraging and commuting habitat nearby as the works are proposed to only affect a small area of the River Slaney. As the works are temporary, the foraging and commuting habitat affected by potential disturbance will be restored to full availability to otter once they are completed. In addition, the Proposed Project works will be only performed during the day, further reducing the likelihood of disturbance to the species as the species is primarily nocturnal with activity peaks at dusk and dawn (Lundy and Montgomery, 2010).

Bats

The Proposed Project may cause disturbance to the bats due to the noise and vibrations caused by trench digging, pipeline installation and sheet piling associated with creating a dry works area. This may cause a bat to flee the roost which could be detrimental to the individual. However, the likelihood of the potential roost being occupied is relatively low due to the low suitability of the tree. The ivy was not dense enough to provide a suitable roost on its own, and so it was recorded precautionarily in case it was obscuring another, more suitable feature.

The works are temporary and will cause a low level of disturbance. There is a high likelihood that no disturbance of bats will occur, however if a bat is disturbed it will only affect that individual as the potential roost is suitable for only one bat. If the bat is disturbed, there is a low likelihood that it will flee the roost, however if it does there is a small woodland roughly 100m northeast of the tree which is also along the river, offering suitable potential alternate roosting habitat. A larger woodland is also present approximately 350m east of the tree with semi-mature trees.

5.1.2 Pollution

Otters

Construction will take place near the banks of the Slaney River and involves the creation of a dry works area and potentially dewatering within this dry works area. This provides points of entry for pollutants associated with construction works. A pollution event resulting from material spillages, hydrocarbon leaks, or sediment laden surface water runoff may lead to direct impacts upon water quality and prey availability (fish biomass) for otter.

Bats

There is no pathway for pollution to cause an effect on bats in the local area.

5.2 Mitigation

The following mitigation measures will be implemented to either avoid or reduce the aforementioned potential impacts to otter and bats from the Proposed Development.

5.2.1 Ecological Clerk of Works

An Ecological Clerk of Works (EcoW) will be required on site for any works deemed to be of a sensitive nature due to the number of sensitive ecological receptors and the works taking place within watercourses connected to European sites. Where sensitive habitats or species could be impacted, the ECoW will be on site to oversee the implementation of all mitigation measures as described below. The ECoW will have the appropriate qualifications and relevant experience and will be a member of a professional body such as CIEEM or similar.

5.2.2 Mitigation Measures for Disturbance

Otters

Measures set out herein will be implemented at works adjacent to or near the Slaney River to ensure that there will be no disturbance or mortality of otter during the Construction Phase of the Proposed Development:

- The National Roads Authority (NRA) (2008) Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes will be adhered to;
- Works will take place within a defined working area to reduce the footprint of the Proposed Development to minimise potential for impact to otter foraging habitat;
- There will be no in-stream activities in this area;

- Any excavations will be covered at night to prevent otter from falling in or becoming trapped;
- There will be no night-time working;
- Any lights will be turned off after working hours.
- A pre-construction survey will be carried out to ensure no change in the baseline information to ensure that mitigation measures remain relevant. This should be conducted no more than 10-12 months in advance of construction. Should there be a change in otter behaviour or new holts created a derogation licence from the NPWS may be required;
- No works should be undertaken within 150m of any holts at which breeding females or cubs are present. Otter breeding may take place during any season so breeding activity at holts needs to be determined on a case-by-case basis. No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence;
- A Noise and Vibration Management Plan will be developed by the appointed contractor;
- All site access roads will be kept even to reduce vibration;
- Noise levels will not exceed permissible levels for construction works (80dB(A)) based on Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA, 2004). Additionally, given that works will be confined to daylight hours where possible and the species potentially at risk are most active outside of working hours no significant impacts from noise will occur; and
- Post construction, the site will be revegetated where possible.

Bats

- There will be no night-time working;
- Any lights will be turned off after working hours;
- A pre-construction survey will be carried out to ensure no change in the baseline information to ensure that mitigation measures remain relevant. This should be conducted no more than 10-12 months in advance of construction. Should there be any changes or new roosts discovered on this pre-construction survey, a separate derogation license will be applied for;
- A Noise and Vibration Management Plan will be developed by the appointed contractor;
- All site access roads will be kept even to reduce vibration; and
- Noise levels will not exceed permissible levels for construction works (80dB(A)) based on Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA, 2004). Additionally, given that works will be confined to daylight hours where possible and the QI species potentially at risk are most active outside of working hours no significant impacts from noise will occur.

5.2.3 Mitigation Measures for Pollution

Potential pollution impacts from construction are via the transport of pollutants and/or sediments into the Slaney River via overland flows or leakages/surface water run-off from the construction site and machinery during the construction.

In light of 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 environment. The introduction of construction-based pollutants or sediment-based run-off may impact otter reducing prey availability. Measures to mitigate pollutants and/or sediment entering the watercourse during construction of the Proposed Development, and therefore protecting otter, are outlined below.

Measures set out herein, and in the Construction and Environmental Management Plan (CEMP) for the proposed Development, will be implemented to ensure that there will be no pollution of surface water during

the construction phase of the Proposed Development. The measures will be incorporated into the contractor's Construction Environmental Management Plan (CEMP) and the CEMP will be developed in accordance with the following guidance documents and legislation:

- Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (Inland Fisheries Ireland, 2016);
- 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 C692: Environmental Good Practice on Site (Audus et al., 2010); and
- S.I. No. 40/2020 - European Union (Good Agricultural Practice for Protection of Waters) (Amendment) Regulations 2020.

5.2.3.1 Mitigation for Working Near Watercourses

Mitigation measures with respect to works taking place adjacent to the River Slaney 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 are required between works areas and water features where construction is within 30 m 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 shall terminate on high ground, along roads the silt fence will be installed adjacent to drainage ditches;
- The silt fence shall be constructed using permeable filter fabric (Hy-Tex Terrastop silt fence or similar) rather than a mesh material;
- The vegetated turves shall 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 shall remain in-situ until the vegetation on the disturbed ground is re-established;
- The fence shall 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;
- Two lines of silt fencing will be installed in sensitive areas as agreed with the ECoW; and
- A record of its installation, inspection and removal must be maintained by the ECoW.

5.2.3.2 Mitigation Measures 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 for storage of materials:

- All oil and diesel storage facilities will be at least 30 m from any watercourse, including surface water drains, and outside the 1:100 flood extent (1% Annual Exceedance Probability);
- 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 across the site to prevent 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;
- 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:
- The pipe will be fitted with a manually operated pump or a valve at the delivery end which closes automatically when not in use;
- The pump or valve will be fitted with a lock;
- The pipe will be fitted with a lockable valve at the end where it leaves the tank or bowser;
- The 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, capacity information and hazard warnings; and
- 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, the Contractor will ensure that:
- Site-specific procedures are in place for bulk deliveries; and
- Delivery points and vehicle routes are clearly marked.
- Emergency procedures will be displayed, and suitably sized spill kits will be available at all delivery points, and staff will be trained in these procedures and the use of spill kits.
- Fuel and oil leaks from vehicles and plant

The use of vehicles and plant poses similar risks to those posed by storage of liquids. Fuel and oil may leak from such equipment which may enter drains and/or watercourses, as well as contaminating the ground itself. The following measures will be implemented to reduce this risk:

- Vehicles and plant provided for use on the site will be in good working order to ensure optimum fuel efficiency, and will be regularly inspected to ensure they are free from leaks;
- Sufficient spill kits will be carried on all vehicles;
- Vehicles and plant will be regularly maintained 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
- 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 risks associated with concrete pouring:

- When working in or near the surface water and the use of introduced materials (e.g. oil) cannot be avoided, alternative materials such as biodegradable oils will be used;
- Placing of concrete in or near watercourses will only be carried out under the supervision of the 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 run-off prevented from entering the watercourse;
- Concrete waste and wash-down water will be contained and managed on-site 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).

5.3 Consideration of Alternatives

5.3.1 Alternative Project Options

The following is a summary of alternatives to this outflow location at the River Slaney that were considered, and why they were passed over in favour of the proposal to the outflow into the River Slaney.

Maintain same outfall location

The current outfall location into a minor watercourse (the Kildavin Stream) was considered as an alternative to the new outflow location on the River Slaney, however this was not considered sufficient as the river has a lower assimilative capacity than the River Slaney, increasing the risk of non-compliance with emission limit values set by Uisce Éireann (full Waste Acceptance Criteria results in Appendix B). This in turn would lead to a higher risk in harming the biodiversity of the smaller watercourse in the long term due to a higher level of pollutants than is considered acceptable, whereas the River Slaney has a higher assimilative capacity and so will dilute pollutants more effectively, limiting the risk to flora and fauna in the area. Even with an extra layer of treatment to the effluent added, the limited assimilative capacity of the Kildavin Stream would not withstand the pollutants without negative effects.

Different watercourse outfall

There are no alternate suitable watercourses nearby. The closest watercourse that is neither the River Slaney or the Kildavin Stream is the Clashavey River, which is prone to dry up and is also a minor watercourse which is unlikely to meet the needed assimilative capacity to withstand any potential pollutants produced by the outfall location. Additionally, this would add another 4km of necessary pipeline installation to reach the river, which would increase disturbance to the potential surroundings.

Alternate location along the River Slaney

An alternative location along the River Slaney was considered, however it was ultimately deemed unsuitable due to the need to minimise environmental and public disturbance. The selected pipeline route primarily follows existing roads which lowers the potential impact on the surrounding environment. By placing the outfall location close to the road, the Proposed Project minimises excavation in sensitive areas, as the only feasible alternative would be to follow the road and then follow the riverbank to a different location. The excavation would still cause the same amount of potential disturbance to bats as the tree with bat potential is near to the road and so the excavation would occur near to this regardless, it also increases the likelihood of disturbing otter due to more works near to the river. In addition, the new outfall location would have to be into the River Slaney due to the lack of suitable alternatives listed above, and so the potential to disturb foraging otter still remains with the outfall installation.

5.3.2 Alternative Measures to Potential Disturbance

Otters

For otter, the only concern is disturbing foraging/commuting habitat. As the outfall location will have to be into the River Slaney, there is no feasible alternative. Construction will have to be undertaken adjacent to and potentially partially within (in the case of creating a dry works area) the river. There is no chance of mortality or disturbing otters in their resting/breeding site, as none were found within the site vicinity (1km downstream or 100m upstream of the outfall location). Therefore, this location which may potentially disturb foraging/commuting otter is considered the most suitable.

The licence will not cause long-term impacts on the species concerned, as there is an abundance of alternate foraging and commuting habitat nearby and the works are proposed to only affect a small area of the River Slaney. As the works are temporary, the foraging and commuting habitat affected by potential disturbance will be restored to full availability to otter once they are completed. In addition, the Proposed Project works will be only performed during the day, further reducing the likelihood of disturbance to the species as the species is primarily nocturnal with activity peaks at dusk and dawn (Lundy and Montgomery, 2010).

The mitigation proposals detailed above have been designed to meet criteria for licence application.

Bats

The tree cannot be directly checked prior to works commencing due to health and safety concerns. The main section of the tree with ivy directly overhangs the River Slaney, which is a moderately fast flowing river. This also rules out a pre-construction dusk survey due to health and safety concerns, due to the requirement for working in the dark adjacent to a river.

With this in mind, the most suitable process would be to commence with the works with the potential risk of disturbance to one roosting bat.

The licence will not cause long-term impacts on the species concerned, as if a bat is disturbed it will only affect that individual as the potential roost is suitable for only one bat. If the bat is disturbed, there is a low likelihood that it will flee the roost, however if it does there is a small woodland roughly 100m northeast of the tree which is also along the river, offering suitable potential alternate roosting habitat. A larger woodland is also present approximately 350m east of the tree with semi-mature trees, and so there is a high likelihood that the individual would be able to find an alternative roosting site. As the Works, and so the disturbance, are temporary and will not affect the tree long term, the bat will also be able to return to the potential roost once the works are completed.

The mitigation proposals detailed above have been designed to meet criteria for licence application.

6. Application for Regulation 54 (Article 16) Derogation Licence

In order for the Proposed Development to go ahead, a derogation licence must be sought. Article 16 of the Habitats Directive sets out three conditions, all of which must be met before a derogation from the requirements of Article 12 or Article 13 of the Directive can be granted. These conditions are also set out in Regulation 54 of the Regulations. The conditions are:

1. A reason(s) listed in Regulation 54 (a)-(e) applies;
2. No satisfactory alternatives exist; and
3. Derogation would not be detrimental to the maintenance of a population(s) at a favourable conservation status.

The Proposed Development has been assessed under these three conditions.

6.1 Test of Condition One – Reasons for Seeking Derogation

Regulation 54(2) (a)–(e) states that a derogation licence may be granted for any of the following reasons:

> (a) In the interests of protecting wild flora and fauna and conserving natural habitats;
>
> (b) To prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property;
>
> (c) In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;
>
> (d) For the purpose of research and education, of re-populating and re-introducing these species and for the breeding operations necessary for these purposes, including artificial propagation of plants; or
>
> (e) To allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species to the extent specified therein, which are referred to in the First Schedule.

The Proposed Development falls under reason (a) "In the interests of protecting wild flora and fauna and conserving natural habitats", and reason (c) "In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment".

The reasoning for reason (a) is the Proposed Project is improving water quality. The existing overloaded plant discharges into the Kildavin Stream, which has limited assimilative capacity, posing a risk of pollution to aquatic flora and fauna. By relocating the discharge point to the River Slaney, which has greater assimilative capacity effluent, the project reduces potential harm to sensitive species and habitats. Additionally, the proposed pipeline route follows existing roads, avoiding unnecessary disruption to riparian habitats and minimising disturbance as much as possible to otters and bats. Mitigation measures, including strict pollution control and ecological monitoring, will further ensure that local biodiversity is safeguarded throughout construction and operation. The outfall location into the River Slaney causes the least disruption to local wildlife, including foraging otters and bats.

The reasoning for reason (c) is The Proposed Project ensures proper wastewater management for the surrounding community. The existing plant is overloaded and unable to meet discharge standards, posing a risk of pollution to local water bodies, which could have negative consequences for drinking water sources,

aquatic flora and fauna, and public health. By upgrading the system and discharging to the River Slaney, which has greater assimilative capacity, the Proposed Project significantly reduces the risk of contamination and ensures compliance with environmental regulations. Additionally, the project supports economic growth and community development by providing a modern, reliable wastewater infrastructure, preventing future capacity issues as the population grows.

6.2 Test of Condition Two – There is no Satisfactory Alternative

For a derogation licence to be granted, there must be no satisfactory alternatives.

As described in Section 5.3, alternative options were considered as part of the scheme. However no reasonable options will have a lower impact.

Therefore, the proposed measure is the only viable option to ensure the success of the Proposed Development.

6.3 Test of Condition Three – Favourable Conservation Status

The final test for a derogation licence to be granted is considering if granting a derogation licence would be detrimental to the maintenance of the populations of the species in question at a favourable conservation status in their natural range.

The mitigation measures detailed in Section 5.2 have been designed to meet this test. With those mitigation measures implemented, the impacts on otter and bats will be reduced, and the residual disturbance impacts that the derogation licence is required for will be minimal. Once construction is complete, no impacts on otter or bats are envisaged, and it is expected that even if there is any dispersal of either species caused by the Proposed Development, the area will continue to be utilised and inhabited by otter and bats post-construction given the high-value habitat the River Slaney provides to the species.

7. Licence Information

7.1 Qualification as Scientific Agent

The appointed contractor will be providing an Ecological Clerk of Works (ECoW) to act as the client's Environmental Assurance Officer (EAO) for the duration of the works. The ECoW will possess suitable experience of otter and bat survey, monitoring and mitigation. The licence will be in the name of the contractor once appointed, but as this is not yet decided, the name on the licence will be that of the public authority until the contractor is appointed. The Contractor for the works is due to be appointed in 2026. Once appointed the NPWS will be contacted so that the licence can be updated with the Licensee (Contractor's) details.

7.2 Period for Licence

The Contractor for the main works is due to be appointed in 2026. Once appointed the NPWS will be contacted so that the licence can be updated with the Licensee (Contractors) details. We are requesting the licence be granted to cover Summer 2026 and last for approximately 6 months. If there is a delay to the programme which would require an update to the licence the NPWS will be contacted immediately.

8. Summary and Conclusion

The Proposed Development is required to respond to the overloading of the Kildavin Wastewater Treatment Plant and to increase its capacity for projected future needs. Otter is confirmed to forage and commute in the vicinity of the Proposed Development site, due to the data recorded during the desk study and field surveys. The works may impact on otter utilising the River Slaney through disturbance and pollution. With the appropriate mitigation implemented, these impacts are expected to be reduced and/or eliminated. However, the works may still cause disturbance to foraging/commuting otter. In addition, one low-moderate potential bat roost tree was found approximately 7m from the proposed outfall location, which may house an individual bat. The works may impact on a bat potentially roosting in this tree via disturbance from vibrations and noise produced by the works. Alternative route options and methodologies have been considered, but the only feasible option is that being proposed, hence it is not possible to eradicate the possibility of disturbing otter or bats. Therefore, a derogation licence is required for the Proposed Development to progress.

The four stages of the decision-making process to decipher if a derogation licence should be sought as recommended by NPWS (2021) has been followed. Existing information and ecological surveys have been used to determine the likely presence of otter and potential roosting bats in the area (Stage 1 and Stage 2). The potential impacts, mitigation and alternative options have been assessed and considered (Stage 3). There is no satisfactory alternative to proceeding with the works, and therefore a derogation licence is being sought (Stage 4).

The three conditions which must be met before a derogation from the requirements of Article 12 or Article 13 of the Directive can be granted have been met:

1. The Proposed Development is required "*In the interests of protecting wild flora and fauna and conserving natural habitats*" and "*In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment*".

2. There are no satisfactory alternatives to that proposed.

3. The Proposed Development will not be detrimental to the maintenance of the populations of otter at a favourable conservation status in their natural range.

Therefore, a derogation licence is required for the Proposed Development, and the Proposed Development is eligible for this licence.

9. References

Audus, I, Charles, P and Evans, S. (2010). Environmental good practice on site (third edition), CIRIA, London.

Chanin P. (2003), Ecology of the European otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough,

Chanin P. (2003), Monitoring the otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No. 10. English Nature, Peterborough.

CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2021) Good Practice Guidance for Habitats and Species. Version 3. Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edn.). The Bat Conservation Trust, London.

Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. Inland Fisheries Ireland.

Lundy, M.G. & Montgomery, I. (2010) A multi-scale analysis of the habitat associations of European otter and American mink and the implications for farm-scale conservation schemes. Biodiversity and Conservation 19 (14)

Masters-Williams, H., Heap, A., Kitts, H., Greenshaw, L., Davis, S., Fisher, P., Hendrie, M. and Owens, D. (2001). Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors. Construction Industry Research and Information Association.

Murnane, E., Heap, A., and Swain, A. (2006a). Control of water pollution from linear construction projects: Technical Guide. Construction Industry Research and Information Association.

Murnane, E., Heap, A., and Swain, A. (2006b). Control of water pollution from linear construction projects: Site guide. Construction Industry Research and Information Association.

National Biodiversity Data Centre (ND, accessed January 2024). Biodiversity Maps. Available online at: https://maps.biodiversityireland.ie/Map

National Parks and Wildlife Service (NPWS) (2021). Strict Protection of Animal Species - Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public authority.

National Roads Authority (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. National Roads Authority.

National Roads Authority (NRA) (2008). Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. National Roads Authority.

National Roads Authority (2004). Guidelines for the Treatment of Noise and Vibration in National Road Scheme. National Roads Authority.

Vincent Wildlife Trust (2020). Otter Species Project. Accessed February 2024. Available: https://www.vincentwildlife.ie/species/otter.

Appendix A. Photographs

Photograph 1: River Slaney downstream, view from bridge

Photograph 2: River Slaney upstream, view from bridge

Photograph 3: Location of the new outfall, view from the bridge

Photograph 4: Location of the new outfall, view from the road

Photograph 5: Location of the new outfall and view river (upstream), view from left riverbank in proximity of new

Photograph 6: Location of the new outfall, frontal view from the river

outfall location

Photograph 7: Frontal view of the river from the new outfall location

Photograph 8: Downstream view of the river from the new outfall location

Photograph 9: Left riverbank, view from the outfall location

Photograph 10: Active quarry

Photograph 1: River Slaney downstream, view from bridge	Photograph 2: River Slaney upstream, view from bridge

Appendix B. Waste Acceptance Criteria Results

1. River Slaney: Proposed Outfall

The River Slaney, where the proposed effluent discharge point will be located, is a designated SAC. As such, background ambient monitoring data is being collected over a one-year period starting on 21/09/2023 and ending on 12/08/2024.

The Background River Quality samples recorded consist of 15 data points collected between September 2023 and August 2024. 6 no. ammonia sample results are lower than LoD (Limit of Detection), and 1 no. Ortho-P result is lower than LoD. Table 1 below shows the current quality of the receiving waterbody does not allow the EQS's to be met, this is independent of the effluent quality as the ambient data already exceeds the surface water regulation values.

Table 2 - Receiving waterbody quality analysis: River Slaney

	Upstream Water Quality		Good Status EQS	
	Mean (mg/l)	95%ile (mg/l)	Mean (mg/l)	95%ile (mg/l)
Ammonia	0.08 (199%)	0.30 (333%)	0.065	0.14
BOD	4.61 (354%)	15.60 (709%)	1.5	2.6
Ortho-P	0.03 (112%)	0.05 (118%)	0.035	0.075

(Values) represent % WAC Used to Achieve Good Status

A WAC Analysis was performed with 12 data points of Current Effluent Quality data collected from September 2023 to August 2024. Table 2 below shows the proposed discharge point has a negligible impact on the receiving waterbody. Ortho-P is worst affected but still only provides an increase of 2.28% at 95%ile flow and 0.79% at mean flow, while remaining below the Good Quality EQS. The impact on Ammonia and BOD is far below 0.5% for both conditions.

Table 3 – River Slaney WAC Analysis

	Current Discharge Performance	Predicted Downstream Water Quality (PE = 350PE, Current Discharge Performance [See Table])	
	Mean (mg/l)	Mean Condition (mg/l)	95%ile Condition (mg/l)
Ammonia	1.2	0.080 (+0.08%)	0.30 (+0.09%)
BOD	48.8	4.61 (+0.05%)	15.61 (+0.06%)
Ortho-P	4.1	0.028 (+0.79%)	0.054 (+2.28%)

(Values) represent percentage increase against current background data measurement.

2. Kildavin Stream: Proposed SWO

A WAC analysis considering the Kildavin Stream ELVs (Emission Limit Values) and flows was performed. Table 3 shows the ELVs considered, and Table 4 shows the Maximum Discharge Loads obtained for mean flows.

Table 4 – Kildavin Stream WAC Discharge ELVs

Ammonia (mg/l)	0.74
BOD (mg/l)	9.86
Ortho-P (mg/l)	0.30

Table 5 - Kildavin Stream Maximum Discharge Load

Ammonia (kg/d)	0.66
BOD (kg/d)	18.76
Ortho-P (kg/d)	0.21

To calculate the SWO spill characteristic, the future load of 350PE was considered with a proportion of 9% influent (raw wastewater) 14% final effluent (treated) and 77% storm water. The spill flow was calculated at 7.86l/s. The resulting final spill (effluent and influent) loading is shown in Table 5.

Table 6 – SWO Spill loading

Ammonia (kg/d)	0.27
BOD (kg/d)	3.44
Ortho-P (kg/d)	0.13

Table 6 below shows that the anticipated volume and biological characteristics of the overflow events from Kildavin WwTP allow the ELVs to be met, with the below remaining headroom.

Table 7 - Kildavin Stream Remaining Discharge Load Capacity

Appendix C.