Chapter 10 – Water (Hydrology and Hydrogeology)

Uisce Éireann

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BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE

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Contents

Abbreviations 10-i

Glossary 10-ii

10. Water and Hydrology 10-1

10.1 Introduction 10-1
10.1.1 The Proposed Development 10-2
10.2 Legislation and Policy Context 10-4
10.3 Study Assessment and Methodology 10-6
10.3.1 Desktop Study 10-7
10.3.2 Determining Effect Significance 10-7
10.3.3 Mitigation 10-10
10.3.4 Future Baseline 10-10
10.4 Receiving Environment 10-11
10.4.1 Study Area 10-11
10.4.2 Site Development 10-13
10.4.3 Protected Areas 10-13
10.4.4 Hydrology 10-14
10.4.5 Flood Risk 10-25
10.4.6 Hydrogeology 10-25
10.5 Potential Impact of the Proposed Development 10-41
10.5.1 Importance of Receptors 10-41
10.5.2 Potential Effects 10-44
10.5.3 Assessment of Potential Effects 10-50
10.6 Mitigation Measures 10-68
10.6.1 Construction Stage Mitigation Measures 10-68
10.6.2 Operational Phase 10-75
10.6.3 Proposed mitigations and residual effects 10-79
10.7 Cumulative and Interactive Effects 10-84
10.8 Residual Effects 10-85
10.9 Monitoring Requirements 10-85
10.10 Conclusion 10-85
10.11 Difficulties encountered during preparation of this chapter 10-85
10.12 References 10-86

Table

Table 10-1 — Planning policy, legislation, technical guidance and standards....10-4

Table 10-2 — Impact Classification Terminology (IGI, 2013)....10-8

Table 10-3 — Criteria for Rating Site Importance of Hydrological/Hydrogeological Features (IGI, 2013)....10-9

Table 10-4 — Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute (IGI, 2013)....10-9

Table 10-5 — Rating of Significant Environmental Impacts at EIS Stage (IGI, 2013) 10-10

Table 10-6 — SACs and SPAs with Water Dependent Habitats/Species....10-14

Table 10-7 — Proposed Natural Heritage Areas within the Study Area 10-14

Table 10-8 — River water bodies 10-18

Table 10-9 — Lake water bodies....10-21

Table 10-10 — Transitional water bodies....10-21

Table 10-11 — Hydrological Receptor Interaction....10-22

Table 10-12 — Drainage design....10-24

Table 10-13 — Groundwater vulnerability rating at Proposed Development structures 10-31

Table 10-14 — Ground water bodies 10-35

Table 10-15 — Ground investigation groundwater level monitoring data at structures within the Proposed Development....10-37

Table 10-16 — The location and nature of GSI wells and springs located within 250 m of the Proposed Development....10-38

Table 10-17 — Wetlands adjacent to the Proposed Development 10-41

Table 10-18 — Importance Assessment of Receptors – Surface water 10-42

Table 10-19 — Importance Assessment of Receptors – Groundwater....10-43

Table 10-20 — Surface Water Feature Crossings 10-45

Table 10-21 — Drainage design....10-49

Table 10-22 — Impact assessment – Surface Water....10-51

Table 10-23 — Impact Assessment – Groundwater 10-62

Table 10-24 — Proposed Mitigation and Residual Effect – Surface Water 10-79

Table 10-25 – Proposed Mitigation and Residual Effect – Groundwater 10-82

Figure

Figure 10-1 — Overview of the Proposed Development 10-3

Figure 10-2 — Proposed Development Zone of Influence (ZoI) 10-12

Figure 10-3 — Overview of Proposed Development 10-13

Figure 10-4 - River water bodies within Study Area 10-17

Figure 10-5 — Lake and transitional water bodies within Study Area 10-20

Figure 10-6 — Classification of Bedrock aquifers underlying the Proposed Development 10-27

Figure 10-7 — Classification of superficial gravel Aquifers underlying the Proposed Development 10-28

Figure 10-8 — Classification of groundwater vulnerability across the Proposed Development area 10-30

Figure 10-9 — Groundwater recharge volumes across the Proposed Development area 10-34

Figure 10-10 — Locations of GSI wells and springs within 250 m of the Proposed Development 10-39

Figure 10-11 — Surface water course crossings 10-48

Figure 10-12 — Scour Locations 10-77

Abbreviations

Abbreviation	Term
BPT	Break Pressure Tank
CEMP	Construction Environmental Management Plan
DEHLG	Department of Environment, Heritage and Local Government
DHLGH	Department of Housing, Local Government and Heritage
DTM	Digital Terrain Model
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
FRA	Flood Risk Assessment
FGS	Fellow of the Geological Society
GI	Ground Investigation
GSI	Geological Survey Ireland
GWB	Groundwater Body
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HDD	Horizontal Directional Drilling
IAH	International Association of Hydrogeologists
IGI	Institute of Geologists of Ireland
NHA	Natural Heritage Area
NIS	Natura Impact Statement
OPW	Office of Public Works
pNHA	Proposed Natural Heritage Area
PRV	Pressure Reducing Valve
RBMP	River Basin Management Plan
RWI&PS	Raw Water Intake and Pumping Station
RWS&PS	Raw Water Storage and Pumping Station
RWSS	Regional Water Supply Scheme
SAC	Special Area of Conservation
SPA	Special Protection Area
SuDS	Sustainable Drainage Systems
TÉ	Tailte Éireann
WFD	Water Framework Directive
WTP	Water Treatment Plant

Abbreviation	Term
WSI	Wetland Survey Ireland
ZoI	Zone of Influence

Glossary

Term	Definition
Aquifer	Geological formation capable of storing and transmitting groundwater.
Artesian Pressure	Groundwater pressure sufficient to cause water to rise above the level of the aquifer.
Baseflow	Contribution of groundwater to river flow.
Bedrock Aquifer	Groundwater-bearing rock formation beneath superficial deposits.
Catchment	Land area draining to a common watercourse or waterbody.
Cofferdam	Temporary watertight enclosure used to allow construction in dry conditions within or adjacent to water.
Groundwater Vulnerability	Measure of how susceptible groundwater is to contamination from surface activities.
Hydrogeological Connectivity	Connection between groundwater systems and groundwater-dependent receptors.
Hydrological Connectivity	Connection between water features through surface-water pathways.
Karst	Landscape and groundwater system developed in soluble rocks, characterised by enhanced groundwater flow pathways.
Recharge	Movement of rainfall into groundwater systems.
Sedimentation	Deposition of suspended material within a waterbody.
Transitional Water Body	Waterbody where fresh and marine waters mix, such as an estuary.
WFD Risk Status	Assessment of whether a waterbody is at risk of failing to achieve environmental objectives.

10. Water and Hydrology

10.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the likely significant effects of the Ballina and Lough Talt Water Supply Upgrade (herein referred to as 'the Proposed Development') on water, hydrology and hydrogeology. This Chapter also summarises the related regulatory and policy framework, describes the methods used to assess the identified effects, the existing baseline conditions, the proposed mitigation measures required to avoid, prevent, reduce or offset any significant adverse effects and the anticipated likely residual effects after mitigation measures have been applied.

The assessment presented in this Chapter has been informed by a range of supporting technical reports. These include the following:

- A Water Framework Directive (WFD) Compliance Assessment has been prepared by AtkinsRéalis (2026) and submitted as part of this planning application; this assessment considers the potential effects of the Proposed Development on the status of hydrologically connected WFD water bodies, and its relevant findings have been incorporated where appropriate within this Chapter. This is available in Appendix 10-1, Volume 3 of the EIAR;
- A Flood Risk Assessment (FRA) as provided in Appendix 10-2, Volume 3 of the EIAR, has been undertaken by AtkinsRéalis (2026) in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DHLGH, 2009) and other relevant guidance documents, and its findings have been considered in the evaluation of effects.
- A hydrological and WFD compliance Assessment for Lough Conn was prepared by AtkinsRéalis (2026) and presented in Appendix 10-3. Volume 3 of the EIAR, which is a technical report assessing the hydrological impacts and WFD compliance risks associated with proposed increases in abstraction from Lough Conn to support future public water supply demand;
- Ground Investigation (GI) Factual Report (2026) (refer to Appendix 9-1, Volume 3 of the EIAR); and
- Lough Talt Hydrogeological Impact Assessment Report (RPS, 2016) (available in Sligo County Council Planning application ref: 18210; AA Screening and NIS, Volume 1, Document No. MGW0214RP0019 in Appendix D).

The assessment of the water environment also draws on and should be read in conjunction with other relevant Chapters of this EIAR, including:

- Chapter 03 – Project Description which considers the nature, scale, location and design of the Proposed Development, including associated infrastructure, construction activities, operational processes and any requirements for water supply, drainage and discharges;
- Chapter 06 – Population and Human Health, which considers receptors such as drinking water supplies and the dependence of local communities on water resources;
- Chapter 07 – Biodiversity, which addresses the sensitivity of aquatic and water dependent habitats and species; and
- Chapter 09 – Land, Soils and Geology, which considers ground conditions, infiltration pathways and potential pathways for contamination to groundwater.

Where relevant, the findings of these Chapters have been cross referenced in this Chapter to ensure a comprehensive and integrated assessment of potential effects on the water environment.

The assessment of the water environment has been undertaken by appropriately qualified specialists, with Catherine McIntyre responsible for hydrology and surface water aspects of the chapter; and Calum Gibb responsible for hydrogeology and groundwater related aspects of the assessment. Joanne Mackey, Hydrogeologist, contributed to addressing review comments on the Chapter.

Dr Catherine McIntyre is an experienced professional in the water industry with over 12 years' experience. Her skills include water technology development and assessment in the fields of wastewater treatment and water quality. She is proven in project management and an excellent communicator. Her PhD focused on studying the impact of organic nutrients, particularly phosphorus, on freshwater ecosystems. As part of the (Dissolved Organic Matter IN freshwater Ecosystems) DOMAINE programme, this project was key to understanding multiples sources of pollution in contrasting freshwater catchments and their behaviour and impact on water quality. At AtkinsRéalis, Catherine works on catchment science, water quality monitoring and impact assessments, as well as impacts of contaminants of emerging concern. She is experienced in multi-disciplinary working and has led and managed a range of projects, including scoping the Water Quality Management plan of a eutrophic coastal lagoon, determination of the impacts the recast Urban Wastewater Treatment Directive, development of Integrated Urban Drainage Management Plans, among others. Previously, Catherine led a €300,000 project at Irish Manufacturing Research, investigating water sustainability at a large international food and beverage manufacturer. At Bluetech Research, Catherine managed research projects and supported global clients from water utilities to technology providers, providing market intelligence on the latest advancements in treatment technologies. At Biowave Technologies, she was the scientific lead on a €1.8M project to develop industrial scale microwave technology for sludge treatment.

Calum Gibb is a hydrogeologist at AtkinsRéalis with 5 years of industry experience and is currently a fellow of the Geological Society (FGS). He has obtained a MSc in hydrogeology from the University of Birmingham (2023-2025) during which time, the focus of his thesis was an investigation into karst aquifers using tracer testing. He also holds a BSc in Environmental Geography obtained from the University of Stirling (2017-2021). He has previous experience in the consulting industry as both a hydrologist and hydrogeologist, during which time he has worked on a variety of renewable energy projects and major infrastructure projects. He has experience in water feature surveys and peat surveys, surface water and groundwater monitoring, geological and hydrogeological interpretation, EIAR soil, land, geology and water chapters and associated technical assessments. Between 2021 and 2023, he worked as a technical officer on the Environment Agency's groundwater team, gaining experience in environmental permitting, controlled waters risk assessments and land contamination investigations. This has allowed him to develop a strong evidence-led approach to projects, gaining competencies in environmental risk assessments, data management and compliance with regulatory regimes.

Joanne Mackey is a Hydrogeologist with AtkinsRéalis, having joined in March 2026. She is currently a Member-in-Training with the Institute of Geologists of Ireland (IGI) and a member of the International Association of Hydrogeologists (IAH). She holds an MSc by Research (2011–2013) from University College Cork, focused on palaeoenvironmental analysis ("Palaeoenvironments of Upper Cretaceous Mudrocks, Montana, USA"), and a First Class Honours BSc in International Field Geosciences (2007–2011), jointly awarded by UCC and the University of Montana, US. Joanne has approximately nine years' experience across geology and hydrogeology, including early geological field-based and teaching roles (2011–2013), professional experience as a Geologist/Biostratigrapher with RPS Energy in the UK (2013–2016), and more recently as a Hydrogeologist with IE Consulting (2023–2026). Her experience includes field investigation, sampling, geological interpretation, palynological analysis, hydrogeological assessment, EIAR/PECR land, soil, geology and water chapters, WFD assessment, and technical reporting. Between 2016 and 2022, Joanne worked in the pharmaceutical industry in quality and validation roles within highly regulated GMP environments. During this period, she developed strong competencies in data analysis, process validation, risk assessment, and regulatory compliance, which are directly transferable to environmental and hydrogeological consultancy.

10.1.1 The Proposed Development

The Proposed Development is a regionally significant infrastructure project spanning north County Mayo and south County Sligo. The network integrates a series of existing, upgraded, and new assets to deliver a secure and resilient potable water supply to these communities. A full description of the Proposed Development is provided in Chapter 3 – Project Description.

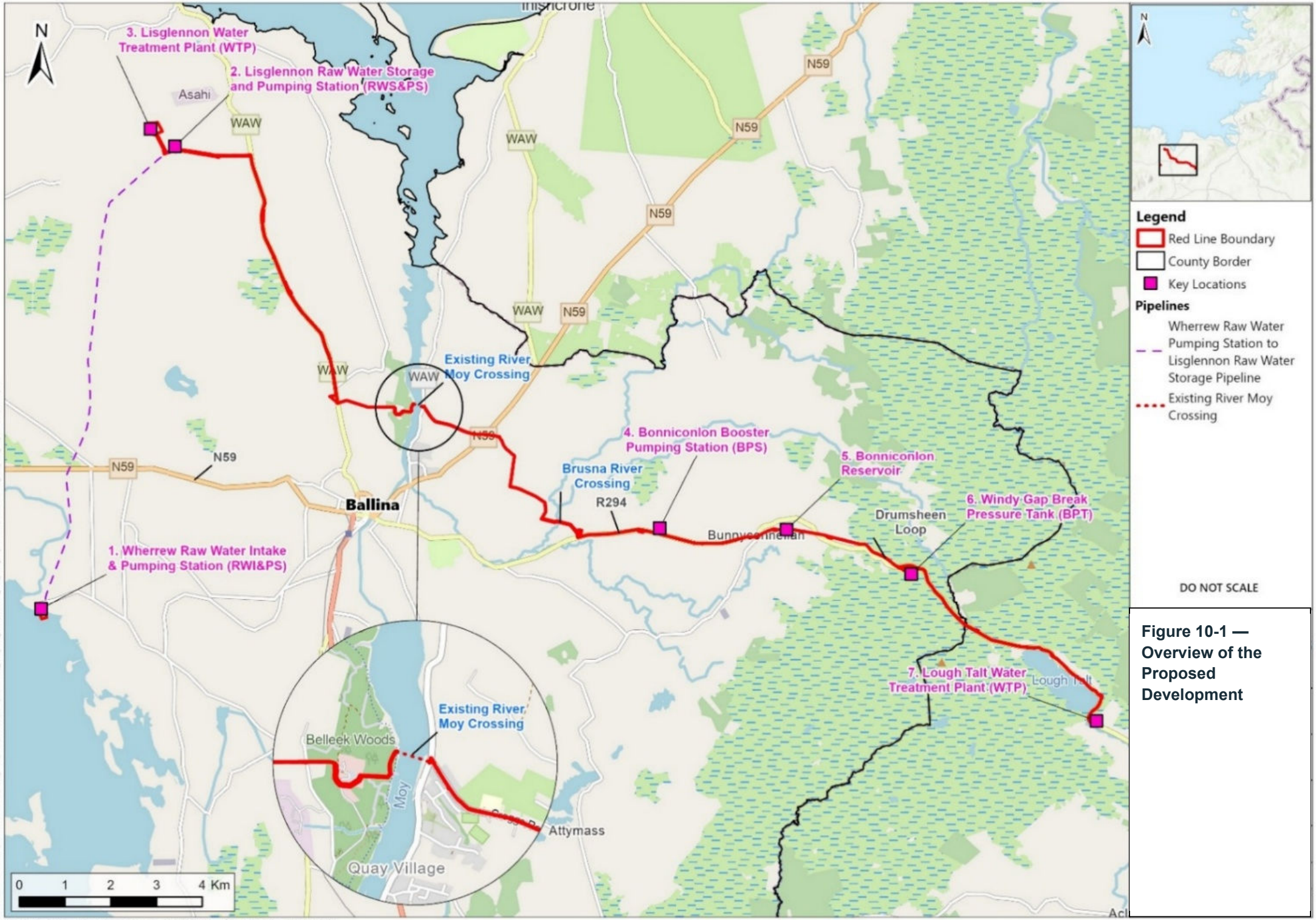


Figure 10-1 — Overview of the Proposed Development

The Proposed Development removes the need for abstraction from Lough Talt for drinking water supply. The abstraction from Lough Talt has led to lower lake levels, and subsequent lower groundwater levels, impacting on the adjacent fen habitat (discussed in more detail in Chapter 7 – Biodiversity), which supports the protected *Vertigo geyeri* snail. The Proposed Development enables the replacement of the existing supply from Lough Talt and allows the lake and groundwater levels to recover and support the fen habitat.

10.2 Legislation and Policy Context

This assessment has been undertaken with consideration of the requirements of key legislative and policy documents, relevant legislation that were considered during the assessment process for this project are as follows:

- Planning and Development Regulations 2001 (as amended);
- Planning and Development Act, 2000 (as amended);
- Guidelines on the information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency (EPA), 2022;
- European Union (EU) Environmental Impact Assessment (EIA) Directive 2011/92/EU as amended by Directive 2014/52/EU (hereafter referred to as the 'EIA Directive');
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (hereafter referred to as the 'EIA Regulations'); and
- The EIA Regulations 2018 (Government of Ireland, 2018).

A summary of the planning policy, legislation, technical guidance and standards relevant to water & hydrology is provided below in Table 10-1.

Table 10-1 — Planning policy, legislation, technical guidance and standards

Document Title	Description / Relevance
Policy	
National Planning Framework (NPF), April 2025	The National Planning Framework (NPF) is the long-term strategy for strategic planning and sustainable development up to 2040. The NPF was originally published in February 2018 and the first revision was adopted in April 2025. The revised NPF seeks to plan for population growth which is expected to grow by one million between 2022 and 2040.
Project Ireland 2040: The National Development Plan 2021-2030	This plan sets out the Government's over-arching investment strategy and budget for the period 2021-2030.
Water Action Plan 2024-2027	This plan sets out the Government's implementation of the WFD within Ireland for the period 2024-2027.
Climate Action Plan (CAP), 2026	This plan sets out the Government's objectives and roadmap of actions to pursue and achieve a transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy by the year 2050.
National Biodiversity Action Plan, 2024	This plan sets the Government's national biodiversity agenda for the period 2023-2030.
Water Services Policy Statement, 2024-2030	This plan sets the Government's strategic approach to water services delivery in the period to 2030 and beyond.
River Basin Management Plan (RBMP) 2022–2027	Implements WFD at national level (complements Water Action Plan)
Legislation	

Document Title	Description / Relevance
Water Framework Directive 2000/60/EC	Key EU legislation which serves as the primary legal framework for water protection and management in the European Union.
Habitats Directive 92/43/EEC	Key EU legislation which aims to conserve natural habitats, their wild fauna and flora through the establishment of the Natura 2000 network as well as the formal protection of key native species and characteristic habitat types across Europe, many of which are aquatic or water-dependant.
Birds Directive 2009/147/EC	Key EU legislation (pre-dating the Habitats directive above) which aims to protect, maintain, and re-establish bird habitats for all wild bird species across Europe, many of which are aquatic or water-dependant.
European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010, as amended)	Protects groundwater quality and sets threshold values for pollutants; implements groundwater aspects of the WFD.
European Communities Environmental Objectives (Groundwater) Regulations 2016 (S.I. No. 366 of 2016, as amended)	Amends and updates groundwater objectives and quality standards under the WFD framework.
European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009, as amended)	Establishes environmental objectives and standards for surface water quality in Ireland in line with the WFD.
European Communities (Quality of Salmonid Waters) Regulations 1988 (S.I. No. 293 of 1988)	Protects waters designated for salmonid species (relevant for River Moy catchment).
Water Environment (Abstractions and Associated Impoundments) Act 2022	Establishes the legal framework for the regulation and licensing of water abstractions in Ireland.
Water Environment (Abstractions and Associated Impoundments) Regulations 2024	Provides detailed provisions for registration, licensing and management of abstractions under the 2022 Act.
Technical Guidance & Standards	
Uisce Éireann Standard Details and Codes of Practice for Developers	Technical guidance for developers in the provision of water and/or wastewater infrastructure which outline the Standard Details and Codes of Practice for Uisce Éireann's requirements.
EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports	Key guidance on EIAR preparation, including water environment assessment.
EPA (2025) Principles of Water Abstractions and	Provides guidance on the principles, licensing requirements and environmental management of water abstractions and impoundments under the Water

Document Title	Description / Relevance
Associated Impoundments Authorisation	Environment (Abstractions and Associated Impoundments) Act 2022 and associated Regulations.
EPA Code of Practice for Domestic Waste Water Treatment Systems (2021)	Sets out the requirements for the site assessment, design, installation, operation, and maintenance of septic tanks and related systems to ensure protection of human health and the environment.in line with WFD objectives. It applies to domestic wastewater treatment systems serving ≤10 population equivalent (PE).
CIRIA C648 & C532 – Control of Water Pollution from Construction Sites	Industry best practice for managing sediment and pollution during construction.
Sustainable Drainage Systems (SuDS) Guidance (e.g. CIRIA C753)	Best practice for managing surface water runoff.
GSI Groundwater Protection Schemes (DoEHLG/EPA/GSI)	Framework for protecting groundwater resources and assessing vulnerability.
Shannon Regional Fisheries Board, 2009. Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. Shannon Regional Fisheries Board, Ireland.	The culvert guidance is not directly applicable to the proposed HDD watermain crossings, but it is relevant in highlighting the need to protect riverbed integrity and fisheries, supporting the use of trenchless methods to minimise in stream disturbance.
Department of the Environment, Heritage and Local Government (DEHLG) and Office of Public Works (OPW) (2009). The Planning System and Flood Risk Management: Guidelines for Planning Authorities. Dublin: The Stationery Office.	Provides the national framework for identifying, assessing and managing flood risk.

10.3 Study Assessment and Methodology

This assessment has been completed in accordance with relevant best practice guidance:

- The hydrogeological assessment has been undertaken with reference to the Institute of Geologists of Ireland (IGI), 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI, 2013). The IGI guidance document is an updated version of the 2002 guidelines, 'Geology in Environmental Impact Statements, A Guide' (IGI, 2002), which was revised to take account of legislative changes, and the operational experience developed by geoscientists in the production of relevant environmental assessments.
- In addition, the hydrological assessment has been informed by relevant national guidance and methodologies for assessing impacts on the surface water environment, including the Uisce Éireann abstraction assessment methodology and associated hydrological assessment approaches. These provide a framework for evaluating

potential effects on surface water bodies, flows and water levels, including the effects of abstraction on receiving water bodies such as Lough Conn.

- This assessment has also been prepared in accordance with, and is fully compliant with, the relevant Environmental Protection Agency (EPA) guidance, 'Guidelines on the information to be contained in Environmental Impact Assessment Reports', published in May 2022, specifically with regard to the significance of effects (as per 'Table 3.4 Descriptions of Effects' of these Guidelines) of the Proposed Development on the receiving water environment.

10.3.1 Desktop Study

A desktop study was conducted in order to characterise the current hydrological and hydrogeological setting of the Proposed Development, compiling relevant background information as required and specifically from the following data sources;

- Bing Maps Aerial Photography (last accessed 06/02/2026);
- Google Maps Aerial Photography (last accessed 06/02/2026);
- Environmental Protection Agency (EPA) Geoportal (last accessed 06/02/2026);
- Water Framework Directive (WFD) water body data pages via catchments.ie (last accessed 06/02/2026);
- Ordinance Survey of Ireland (OSI) web maps via geohive.ie (last accessed 06/02/2026);
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater web maps (last accessed 06/02/2026);
- Geological Survey of Ireland (GSI) Groundwater Body Descriptions (last accessed 06/02/2026);
- Tailte Éireann 2 m Digital Terrain Model (DTM) data mapping;
- Lough Talt Hydrogeological Impact Assessment Report (RPS, 2016);
- Geotechnical Investigation Factual Report (2026) (Appendix 9-1, Volume 3 of the EIAR);
- A WFD assessment for the Proposed Development has been prepared by AtkinsRéalis (2026), which has been submitted as part of this EIAR (Appendix 10-1, Volume 3 of the EIAR). This report addresses the potential effects of the Proposed Development on the WFD status of the WFD water bodies that are hydrologically connected to the Proposed Development site, and relevant findings have been incorporated as required within this Chapter of the EIAR; and
- A Flood Risk Assessment (FRA) has been prepared by AtkinsRéalis (2026) for the Proposed Development in accordance with the above guidance documents as well as in alignment with the "Planning System and Flood Risk Management Guidelines for Planning Authorities' (DHLGH 2009) (Appendix 10-2, Volume 3 of the EIAR); and
- A hydrological and WFD Compliance Assessment for Lough Conn has been prepared by AtkinsRéalis (2026), which has been submitted as part of this EIAR (Appendix 10-3, Volume 3 of the EIAR).

10.3.2 Determining Effect Significance

The assessment of the effects of the Proposed Development on the environment has been undertaken in accordance with best practice, legislation and guidance. In the assessment of significance, the magnitude of the change in baseline conditions and the sensitivity of the resource and/or receptor(s) has been taken into consideration.

The EPA's 'Guidance on the Information to be Contained in an Environmental Impact Assessment Report' (2022) sets out criteria to determine the significance of an effect. Definitions of all effects, taken from the aforementioned EPA Guidance Documents are detailed in full in Chapter 1 of this EIAR (Section 1.5.2). The assessment methodology has been informed by the IGI guidance document, 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (EISs) (IGI, 2013), which provides discipline specific criteria for evaluating the sensitivity of hydrogeological receptors and the magnitude of impacts on groundwater systems. The IGI methodology has been applied where appropriate to assess hydrological and hydrogeological effects, as it offers

a more detailed and specialised framework for these assessments, while remaining consistent with the general significance terminology and approach set out in the EPA (2022) Guidelines. These tables have been obtained from IGI guidance (Table 10-2 to Table 10-5).

Table 10-2 — Impact Classification Terminology (IGI, 2013)

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
	Neutral	A change which does not affect the quality of the environment
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An impact capable of measurement but without noticeable consequences
	Slight	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An impact that alters the character of the environment in a manner consistent with existing and emerging trends
	Significant	An impact, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Profound	An impact which obliterates sensitive characteristics
Duration	Short-term	Impact lasting one to seven years
	Medium-term	Impact lasting seven to fifteen years
	Long-term	Impact lasting fifteen to sixty years
	Permanent	Impact lasting over sixty years
	Temporary	Impact lasting for one year or less
Type	Cumulative	The addition of many small impacts to create one larger, more significant impact
	'Do Nothing'	The environment as it would be in the future should no development of any kind be carried out
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic	Where the resultant impact is of greater significance than the sum of its constituents
	'Worst Case'	The impacts arising from a development in the case where the mitigation measures may substantially fail

Table 10-3 — Criteria for Rating Site Importance of Hydrological/Hydrogeological Features (IGI, 2013)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	▪ Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. Special Protection Areas (SPA) or Special Areas of Conservation (SAC) status. ▪ Surface Water: supporting wetland or ecosystem protected by EU legislation e.g. SAC or SPA status. ▪ Flood Risk: Floodplain or defence protecting more than 100 residential properties from flooding
Very High	Attribute has a high quality or value on regional national scale	▪ Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2500 homes. Inner source protection area for regionally important water source. ▪ Surface Water: wellfields, or rivers, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. ▪ Flood Risk: Floodplain or defence protecting between 50 and 100 residential properties or industrial premises from flooding
High	Attribute has a high quality or value on a local scale	▪ Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source. ▪ Surface Water: WFD class Good ▪ Flood Risk: Floodplain or defence protecting between 1 and 50 residential properties or industrial premises from flooding
Medium	Attribute has a medium quality or value on a local scale	▪ Locally Important Aquifer. Potable water source supplying >50 homes. Outer source protection area for locally important water source. ▪ Surface water: WFD class moderate ▪ Flood Risk: Floodplain or defence protecting 10 or fewer industrial properties from flooding
Low	Attribute has a low quality or value on a local scale	▪ Poor Bedrock Aquifer. Potable water source supplying <50 homes. ▪ Surface water: WFD class poor. ▪ Flood risk: Floodplain with limited constraints and a low probability of flooding.

Table 10-4 — Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute (IGI, 2013)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >2% annually.
Moderate Adverse	Results in impact on integrity of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing

Magnitude of Impact	Criteria	Typical Examples
	or loss of part of attribute	water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >0.5% annually.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident

Table 10-5 — Rating of Significant Environmental Impacts at EIS Stage (IGI, 2013)

Importance of Attribute	Magnitude of Impact			
	Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/Moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/Moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

10.3.3 Mitigation

Mitigation measures are proposed in response to the project activities in the Proposed Development to reduce the significance of any potential effects of the activities on the water and hydrology environment.

10.3.4 Future Baseline

In the absence of the Proposed Development, pre-existing drinking water infrastructure would remain unchanged within the Study Area at the Ballina and Lough Talt Regional Water Supply Schemes (RWSSs). Anticipated population growth can be expected to exceed the water supply capacity at Lisglennon WTP, and there would be increased pressure on water storage facilities. Continued pressure on the water levels at Lough Talt due to uninterrupted abstraction in combination with climate change would result in the significant degradation of supporting habitat of the Annex II protected species *Vertigo geyeri*, and thus significant negative effects to the species and damage to the Lough Hoe Bog Special Area of Conservation. Should the Proposed Development be successfully constructed, this pressure on water levels at Lough Talt would likely be significantly reduced and would have a positive effect on the supporting habitat of *Vertigo geyeri.*

10.4 Receiving Environment

10.4.1 Study Area

The receiving environment describes the current hydrological and hydrogeological environment of the Proposed Development and is considered to be the baseline environment. The Study Area has been selected to include all water features within an approximate radius of 2 km of the Proposed Development, which includes a total of 31 WFD water bodies. The National Roads Authority recommends a Study Area of 500 m for the assessment of national road schemes with respect to geology, hydrology and hydrogeology. Given the linear nature of the majority of the Proposed Development, this is considered a comparable assessment[1]. A conservative approach has been taken to expand the Study Area to 2 km to address the potential effects of the larger areas of infrastructure and to take into account the potential presence of karst features and fracture networks. Anticipated Zones of Influence (ZoI's) are likely to be localised, as they represent relatively small scale works when considered at the water body scale. A full visualisation of the Proposed Development's ZoI is depicted in Figure 10-2 below.

[1] National Roads Authority (2009). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes. National Road Authority guidelines (Last accessed: March 2026)



Figure 10-2 — Proposed Development Zone of Influence (ZoI)

Construction activities would likely be limited to a discrete, linear corridor along the new and existing trunk main between Lisglennon WTP to Lough Talt WTP, with excavation depths anticipated as being between 1-3 m below ground level (bgl). Works to existing Raw Water Intake (RWI), Raw Water Pumping Station (RWPS), and WTP infrastructure would also likely take place within the footprint of existing infrastructure sites. Despite this, there are a number of sensitive sites along the proposed route, including the need for various watercourse crossings – via either open cut or trenchless methods (e.g. horizontal directional drilling HDD), with some of these occurring within the River Moy SAC. Additionally, a new intake pipe approximately 165 m in length will be installed into Lough Conn, extending beyond the footprint of the existing site Wherrew RWI&PS.

10.4.1.1 Proposed Development schematic

Figure 10-3 provides an overview of the Proposed Development, illustrating the sequence of raw water and treated water infrastructure elements, including the Wherrew RWI&PS, Lisglennon RWS&PS, Lisglennon WTP, the Bonniconlon BPS, Bonniconlon Reservoir, Windy Gap BPT, and Lough Talt WTP, together with the connecting pipeline sections (Pipelines A–E). The figure also identifies key offtakes (e.g. Ballina and future Easkey) and the location of the existing River Moy crossing between Belleek Woods and Quay Village.

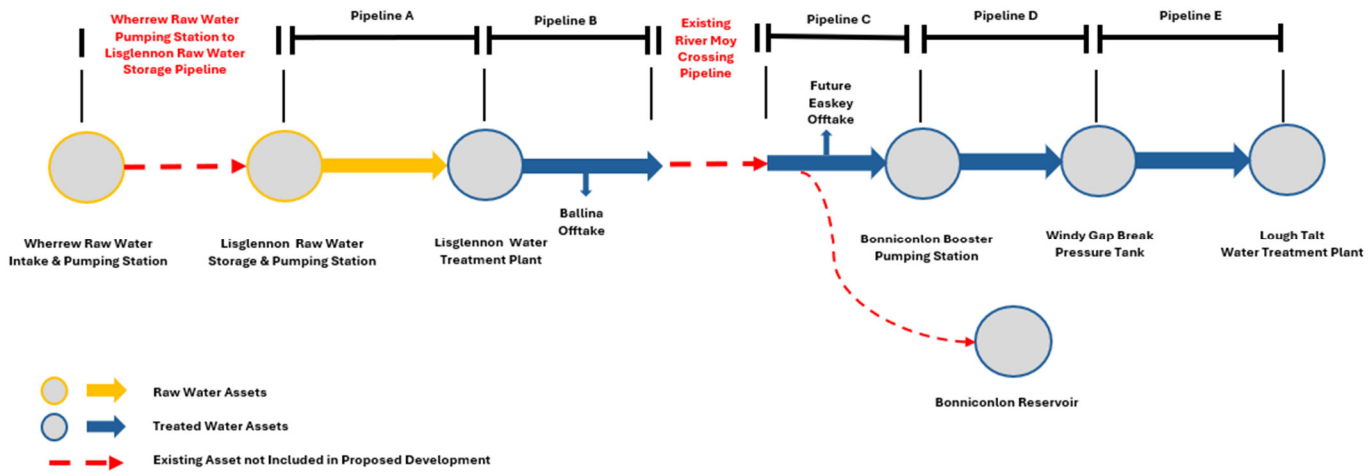


Figure 10-3 — Overview of Proposed Development

10.4.2 Site Development

A review of historical maps (including available 6-inch historical maps, 25-inch historical maps and aerial photographs (1995 to 2018) from the Ordnance Survey of Ireland) (OSI, 2025) and current aerial photography (Bing Maps, 2025), confirms land use within the Proposed Development is generally greenfield with the exception of the existing pumping station at Wherrew, including abstraction infrastructure within Lough Conn, the existing Lisglennon RWS&PS, Lisglennon WTP, and existing WTP at Lough Talt, which are brownfield (developed land) and the route of the water mains, which will cross predominantly public roads, including local and regional roads (such as R-294 and R-314). The surrounding lands have developed slowly since the late twentieth century, however the dominant land use remains agricultural at present. A detailed summary of land-use in relation to the Proposed Development is presented in Chapter 9 – Land, Soils, and Geology. Agronomy is discussed in Chapter 8.

10.4.3 Protected Areas

The full list of European protected sites and qualifying interests is detailed in Chapter 7 – Biodiversity (Table 7-3) and described in depth in Chapter 7. Special Areas of Conservation (SACs) and Special Protected Areas (SPAs) with

Water Dependent Habitats/Species that are hydrologically connected to the Proposed Development and considered in this chapter are given in Table 10-6.

Table 10-6 — SACs and SPAs with Water Dependent Habitats/Species

Site name	Site code	Location
River Moy SAC	002298	Within the Proposed Development site
Killala Bay/Moy Estuary SAC	000458	Within the Proposed Development site
Lough Conn and Lough Cullin SPA	004228	Within the Proposed Development site
Killala Bay/Moy Estuary SPA	004036	Within the Proposed Development site
Lough Hoe Bog SAC	000633	Adjacent to the Proposed Development site

There are also proposed Natural Heritage Areas (pNHAs) overlapping with the Study Area for the Proposed Development. These are detailed in Table 10-7.

Table 10-7 — Proposed Natural Heritage Areas within the Study Area

Site name	Site code	Location
Lough Conn and Lough Cullin pNHA	000519	Within the Proposed Development site
Killala Bay/Moy Estuary pNHA	000458	Within the Proposed Development site
Lough Hoe Bog pNHA	000633	Adjacent to the Proposed Development site

Hydrological connectivity arises through both direct and indirect pathways. Direct connectivity occurs where project elements (e.g. abstraction at Lough Conn or watercourse crossings) interact with surface water systems that are hydraulically linked to the protected areas. Indirect connectivity is present through tributary networks, drainage pathways, and potential transport of suspended sediment or contaminants during construction activities. These pathways enable the potential transmission of changes in flow regime, water quality, or sediment dynamics from upstream locations to downstream sensitive receptors.

The extent and nature of this connectivity are described in detail in Section 10.4.4, which identifies the relevant hydrological receptor interactions in relation to the project element. The implications of this connectivity for designated sites, including the River Moy SAC and Lough Conn and Lough Cullin SPA, are further assessed in Chapter 7 (Biodiversity) and the Natura Impact Statement (NIS), which consider potential effects on protected **h**abitats and species in the context of these defined hydrological pathways.

10.4.4 Hydrology

A review of water courses and water bodies, as mapped by the Environmental Protection Agency (EPA), and located within the Study Area was undertaken (detailed in Sections 10.4.4). In addition to this data, and to provide a more comprehensive review, information on water courses and water bodies was also included from Tailte Éireann (TÉ) datasets. These TÉ datasets include some additional small streams (not identified in EPA mapping), as well as field drains and ditches with connectivity to larger water bodies. A compilation of EPA and TÉ datasets, therefore, provides

a comprehensive image as to the identifiable surface water bodies within the Study Area (detailed in Chapter 7 Biodiversity).

The EPA maintains a database of surface water features, including rivers, lakes, and transitional or estuarine water bodies, alongside the water quality and risk status of each water feature in accordance with the WFD. The purpose of the WFD is to protect and enhance all waters including rivers, lakes, transitional or estuarine waters, coastal waters, and groundwater, in addition to water-dependent wildlife and habitats. This aims to achieve at least Good ecological water quality status for all waters and mitigate against the risk of their decline. Ecological status is assessed on a number of metrics including water quality status and biological status or potential.

Figure 10-4 presents river surface water bodies, while Figure 10-5 presents both lake and transitional surface water bodies. Table 10-8, Table 10-9, and Table 10-10 detail the surface water features identified in the Proposed Development Study Area delineated by water body type. The EPA water body ID is given for each, along with current WFD Status, WFD Risk (3rd Cycle) and whether the water body is hydrologically connected to the Proposed Development as a receiving water body.

The interaction between the Proposed Development and these surface water receptors is further considered in Section 10.5, which identifies the relevant hydrological linkages and potential pathways for effects. The findings of the WFD assessment are also presented in this section, including an evaluation of compliance with Water Framework Directive objectives and the potential for deterioration in status.

In addition, the potential effects associated with raw water abstraction from Lough Conn and the assessment of river crossings along the pipeline route are addressed in Sections 10.5.2 and 10.5.3, respectively. These sections characterise the relevant hydrological attributes which are considered in the subsequent assessment of potential effects.

10.4.4.1 Surface water bodies – River

The river water bodies in the Study Area are depicted in Figure 10-4 - River water bodies within Study Area and detailed in Table 10-8. The WFD status (2019-2024) of each is given, along with the WFD Risk for the 3rd River Basin Management Plan (RBMP) Cycle. WFD status and the implications for the effect of the Proposed Development on the potential for the WFD water bodies to achieve or maintain at least Good Ecological Status is discussed in more detail in the accompanying WFD Assessment (Appendix 10-1, Volume 3 of this EIAR). In this assessment, each river water body was assessed as per the area included in the river sub basin which is delineated in Figure 10-4 - River water bodies within Study Area.

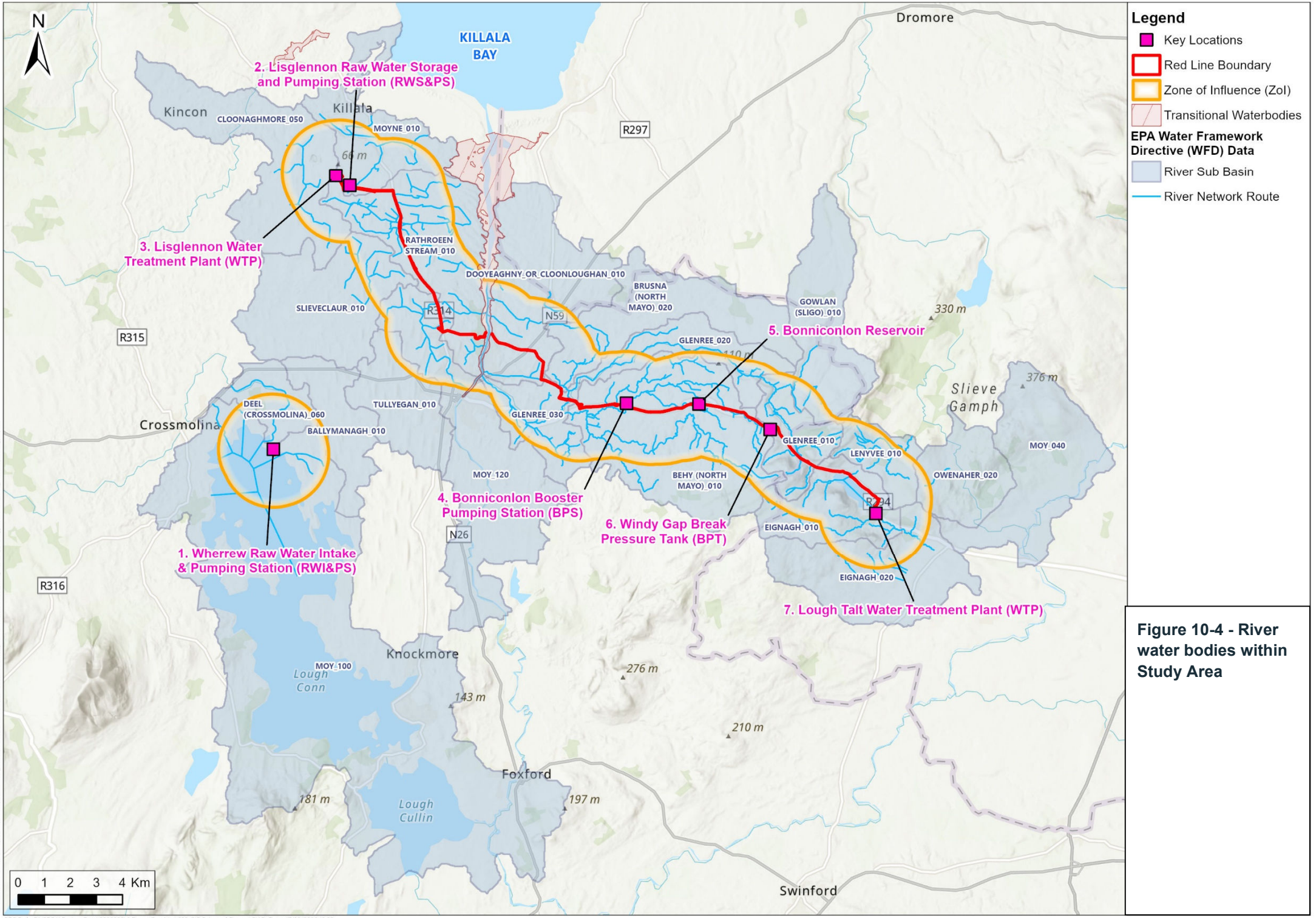


Figure 10-4 - River water bodies within Study Area

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The river sub basins define the land area drained by the river water body and include all surface water features, including named and unnamed streams, and field ditches. Note, the Brusna (North Mayo)_020 water body flows into the Glenree_030 river water body. The river in this location is known locally as the River Brusna and it is in the Glenree_030 river water body where the pipeline crosses the river.

The hydrological connectivity of each river water body to the Proposed Development is indicated in Table 10-8. Where river water bodies fall within the 2 km radius, but are not hydrologically connected to the Proposed Development, they have been excluded from further consideration. All remaining river water bodies are considered for assessment below. Further information on the hydraulic connectivity is provided in Section 10.4.6 and the water bodies associated with crossing of the main trunk in Section 10.5.2.1.1.

Table 10-8 — River water bodies

Water body ID	Water body name	WFD status	WFD risk	Hydrological connection to Proposed Development
IE_WE_34B070600	Brusna (North Mayo)_020	Good	Not at risk	Y
IE_WE_34B080400	Behy (North Mayo)_010	Moderate	Review	Y
IE_WE_34B400840	Ballymanagh_010	Good	Review	N
IE_WE_34C030270	Cloonaghmore_050	Good	Not at risk	Y
IE_WE_34D010400	Deel (Crossmolina)_060	Good	Not at risk	N
IE_WE_34D310990	Dooyeaghny_or_ Cloonloughan_010	Good	Review	Y
IE_WE_34E010100	Eignagh_010	High	Not at risk	Y
IE_WE_34E010200	Eignagh_020	Good	At risk	Y
IE_WE_34G010020	Glenree_010	High	Not at risk	Y
IE_WE_34G010060	Glenree_020	Good	At risk	Y
IE_WE_34G010200	Glenree_030	Good	Not at risk	Y
IE_WE_35G030100	Gowlan (Sligo)_010	Moderate	Not at risk	N
IE_WE_34L06030	Lenyvee_010	High	Not at risk	N
IE_WE_34M020300	Moy_040	Good	At risk	N
IE_WE_34M020800	Moy_100	Moderate	At risk	Y
IE_WE_34M021100	Moy_120	Moderate	At risk	Y
IE_WE_34M190890	Moyne_010	Moderate	Review	Y
IE_WE_34O010100	Owenaher_020	Good	Not at risk	N
IE_WE_34R010200	Rathroeen Stream_010	Good	Review	Y
IE_WE_34S060400	Slieveclaur_010	Good	Review	N
IE_WE_34T830920	Tullyegan_010	Moderate	Review	N

10.4.4.2 Surface water bodies – Lakes and transitional water bodies

The lake water bodies in the Study Area are depicted in Figure 10-5 and detailed in Table 10-9. The WFD status (2019-2024) of each is given, along with the WFD Risk for the 3rd RBMP Cycle. Note: Lough Cullin is outside the Study Area, however, is in hydrological continuance with Lough Conn so potential for effect propagation. Assessment of effects on Lough Conn have considered this connectivity.

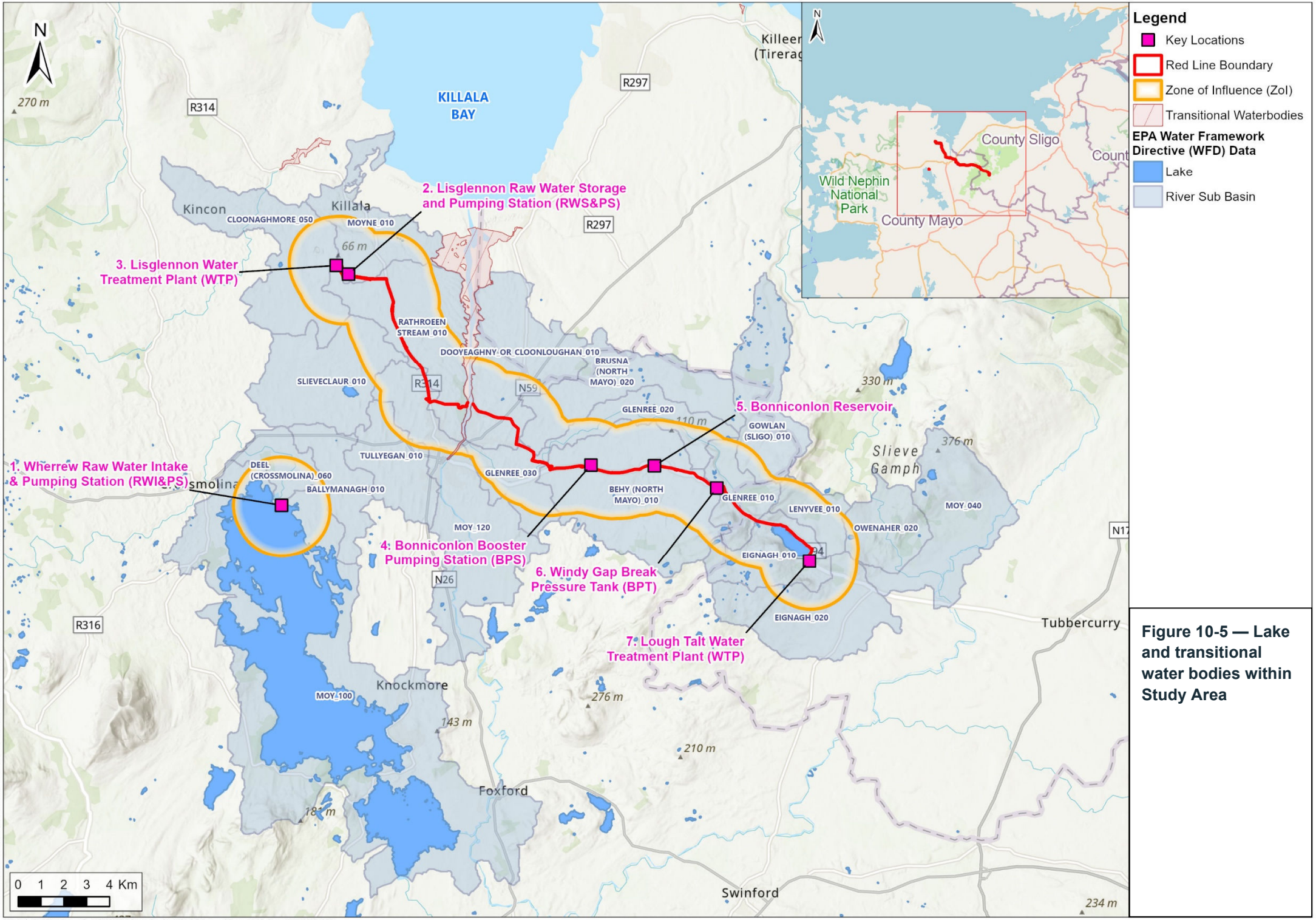


Figure 10-5 — Lake and transitional water bodies within Study Area

Table 10-9 — Lake water bodies

Water body ID	Water body name	WFD status	WFD risk	Hydrological connection to Proposed Development
IE_WE_34_406b	Conn	Good	Review	Y
IE_WE_34_405	Talt	Good	At risk	Y
IE_WE_34_406a	Cullin	Moderate	At risk	Y*

*As noted above, Lough Cullin is outside of the Study Area, but is in hydrological continuance with Lough Conn.

10.4.4.3 Surface water bodies – Transitional

There is just one transitional water body within the Study Area, the Moy Estuary. It is indicated in both Figure 10-4 **- River water bodies within Study Area** and Figure 10-5, it is hydrologically connected to the Proposed Development. The WFD status (2019-2024) is given, along with the WFD Risk for the 3rd Cycle in Table 10-10.

Table 10-10 — Transitional water bodies

Water body ID	Water body name	WFD status	WFD risk	Hydrological connection to Proposed Development
IE_WE_420_0300	Moy Estuary	Moderate	At risk	Y

10.4.4.4 Hydrological Receptor Interaction

The Proposed Development interacts with a number of surface water receptors across different sub-catchments, in association with the project activities. Understanding the linkage between these receptors and specific elements of the project is important in identifying potential impact pathways and informing the subsequent assessment of effects. Table 10-11 provides a summary of the relevant WFD water bodies, together with the applicable project components and the nature of interaction for each element of the project.

The table highlights that direct interaction with the hydrological environment is limited to the Wherrew RWI&PS, located within Lough Conn and the MOY_100 river water body. This element involves in-lake works within Lough Conn, giving rise to potential localised sediment mobilisation and temporary water quality effects, and therefore represents the highest sensitivity interaction within the scheme.

In contrast, Lisglennon RWS&PS and Lisglennon WTP, located primarily within the MOYNE_010 river water body sub-basin, with minor interactions with CLOONAGHMORE_050 and RATHROEEN STREAM_010, exhibit indirect interactions only, arising through surface water drainage, runoff and operational management activities. Similarly, the Bonniconlon BPS and Reservoir, located within the BEHY (North Mayo)_010 river water body sub-basin, and the Windy Gap BPT, which spans BEHY (North Mayo)_010 and GLENREE_010, show very limited and localised interactions, primarily related to surface runoff from hardstanding areas and minor drainage pathways. The repurposed Lough Talt WTP, located within EIGNAGH_010, also demonstrates indirect interaction only, associated with site drainage and operational processes, with no direct instream works proposed.

The new Lisglennon to Lough Talt treated water pipeline represents the most spatially extensive component, intersecting multiple water bodies (see Table 10-11). However, interactions along the pipeline corridor are temporary and construction related, associated with trenching, surface runoff, and localised disturbance at water course crossings, with no permanent alteration to hydrological pathways following reinstatement Water course crossing methods are detailed in Section 10.5.2.1.

Table 10-11 — Hydrological Receptor Interaction

Relevant Project Element	WFD Water body	Aspect of Project	Nature of Interaction with hydrological environment
Wherrew RWI&PS (Lough Conn)	MOY_100 and Lough Conn	Intake pipeline installation, lakebed preparation, intake unit placement and maintenance	Direct in lake works with potential for localised sediment mobilisation, temporary disturbance of lakebed, and risk of accidental pollution during construction and operational maintenance
Lisglennon RWS&PS / WTP	RWS&PS: MOYNE_010 WTP: Intersects three water bodies. MOYNE_010 on the east of the site; CLOONAGHMORE_050 on the northwest and RATHROEEN STREAM_010 on the southwest	RWPS: Pumping infrastructure upgrade and operation WTP: Treatment plant upgrade and operation	RWPS: Indirect interaction via site drainage and runoff WTP: Indirect interaction through surface water drainage
Bonniconlon BPS	BEHY (NORTH MAYO)_010	BPS: New pumping station construction and operation	BPS: Localised interaction via surface runoff, hardstanding drainage
Bonniconlon Reservoir	BEHY (NORTH MAYO)_010	Reservoir: Water storage infrastructure	Reservoir: Limited interaction; surface water runoff from hardstanding areas and operational drainage controls
Windy Gap BPT	BEHY (NORTH MAYO)_010 to the west and GLENREE_010 to the east	Pressure management infrastructure	Very limited interaction; minor surface water drainage from site footprint
Lough Talt WTP (Repurposed)	EIGNAGH_010 and Lough Talt	Conversion to treated water storage facility	Indirect interaction via site drainage, residual treatment processes and operational management
Pipeline A	MOYNE_010, RATHROEEN STREAM_010	Pipeline construction and reinstatement	No surface watercourse crossings identified on this route. Temporary disturbance during open-cut pipe installation,

Relevant Project Element	WFD Water body	Aspect of Project	Nature of Interaction with hydrological environment
			potential sediment mobilisation and runoff; reinstatement to pre-construction condition.
Pipeline B	MOYNE_010, RATHROEEN STREAM_010, MOY_120	Pipeline construction and reinstatement	Open-cut and trenchless surface watercourse crossing techniques. Temporary disturbance during pipe installation, potential sediment mobilisation and runoff near water crossings; reinstated to pre-construction condition. No works are proposed within or beneath the River Moy. See Table 10-20.
Pipeline C	DOOYEAGHNY_or_ CLOONLOUGHAN_010, BRUSNA (NORTH MAYO)_020, GLENREE_030, BEHY (NORTH MAYO)_010	Pipeline construction and reinstatement	
Pipeline D	BEHY (NORTH MAYO)_010, GLENREE_010	Pipeline construction and reinstatement	
Pipeline E	GLENREE_010, EIGNAGH_010	Pipeline construction and reinstatement	

10.4.4.5 Surface Water Abstractions

10.4.4.5.1 Lough Conn

There is currently an abstraction in place at Lough Conn through the Wherrew raw water intake which supplies Wherrew WTP and Lisglennon WTP. This abstraction has been assessed and granted a licence (Ref Licence Register No. R00651-02) for a maximum volume of 20,100 m^3/day.

Lough Conn is connected to Lough Cullin to the south by a narrow channel that passes under a regional road at Pontoon village. There is no evidence of any hinderance to flow between Lough Conn and Lough Cullin. As such, there is an assumption that there is a strong hydrological link between these two water bodies. Lough Conn does not have any other outfall, other than into Lough Cullin and it is assumed that neither lough has significant losses to groundwater. Drainage of the Moy in the 1960s lowered the level of the lakes, exposing wide areas of stony shoreline and wet grassland, which are liable to flooding in winter. This increased the habitat diversity of the shoreline and created a number of marginal wetlands, including fens and marshes which are not protected.

It is anticipated that the future water demand for Ballina and Lough Talt water supply schemes will be 38,120 m^3/day by 2044. The Proposed Development will see the abstraction increase to meet this demand. The effect of the increased abstraction on Lough Conn and Lough Cullin, as well as the downstream River Moy has been assessed in the accompanying report, Lough Conn Hydrological Assessment (Appendix 10-3, Volume 3 of this EIAR) to the abstraction amount of 40,000 m^3/day, as a conservative approach. The results of this assessment are detailed below in section 10.5.3.1.1.

10.4.4.5.2 Lough Talt

Lough Talt Regional Water Supply serves a large rural supply area in south County Sligo with a population of approximately 13,744 people (as of June 2026). Currently, raw water is abstracted from Lough Talt and then treated at facilities on an existing Lough Talt Water Treatment Plant (WTP) site.

Abstraction has become more closely managed due to environmental and regulatory considerations, particularly the need to protect the sensitive fen habitat along the lakeshore that supports the rare *Vertigo geyeri* snail. This habitat depends on consistent groundwater seepage, which is directly controlled by lake water levels and their interaction with an underlying gravel aquifer. Hydrogeological investigations (e.g. RPS, 2016) have shown that the lake is in hydraulic continuity with this aquifer, meaning that reductions in lake level caused by abstraction can propagate through the groundwater system and influence ecological conditions.

Hydrogeological investigations (RPS, 2016) confirmed that abstraction from the lake can negatively affect groundwater levels and reduce the artesian conditions required to sustain groundwater seepages within the adjacent fen habitat, which supports the protected *Vertigo geyeri* snail. Together, these environmental concerns provided a strong justification for re-evaluating reliance on Lough Talt as a source. Consequently, the current upgrade and Proposed Development of the water supply scheme represent a significant shift in approach. By moving away from direct abstraction from the lake and developing alternative supply and treatment infrastructure, the scheme addresses both regulatory compliance and ecological protectionand more stable hydrogeological conditions for the sensitive lakeside habitat.

In this context, the proposed upgrade to the water supply scheme which removes the need for direct abstraction from the Lough Talt represents a positive development. By eliminating abstraction pressures, lake levels can remain more stable, allowing groundwater heads to be maintained and supporting the continued operation of groundwater seepages. This, in turn, reduces the risk of ecological impact and supports the long-term protection of the sensitive fen habitat, marking a shift towards a more sustainable and environmentally protective water management approach.

10.4.4.6 Drainage Design

Current management of stormwater, runoff and wastewater (as appropriate) for each site in the Proposed Development is described in Table 10-12 below with more details of the existing infrastructure in Section 3.2 the Chapter 3 – Project Description.

Table 10-12 — Drainage design

Site	Current drainage
Wherrew RWI&PS	Existing site drainage consists of road gullies which is connected to the existing local on-site stormwater system.
Lisglennon RWS&PS	A portion of runoff from hardstanding areas is captured by gully traps and discharged into an existing open drain and the remainder portion of runoff is discharged via the existing stormwater network (comprising of gullies and pipelines) into the neighbouring stream (Moyne 100) across the road.
Lisglennon WTP	The existing surface water management system consists of a conventional system of gullies and drains across the road, running towards soakpits along existing roads.
Bonniconlon BPS	Greenfield site
Windy Gap BPT	Greenfield site
Lough Talt WTP	The existing network consists of a conventional drainage network, which includes road gullies, pipe network with manholes for maintenance. The pipe network conveys the surface water to the existing attenuation pond located at the southeast corner of the site. The surface water is collected in an attenuation

Site	Current drainage
	pond and is discharged from the site to the existing outfall near the eastern corner of the site. The existing flow control device located downstream from the attenuation pond restricts the flow of surface water to pre-development runoff rate. This results in the surface water backing up and gradually filling the attenuation pond to pre-determined level. The existing attenuation pond is sized to cater for extreme rainfall events. An existing septic tank is located near the south-western end of the site.
Bonniconlon Reservoir	None at present

10.4.5 Flood Risk

AtkinsRéalis was commissioned to conduct a Flood Risk Assessment (FRA) in support of the planning application for the Proposed Development (refer to Appendix 10-2). The FRA was conducted in accordance with 'the Planning System and Flood Risk Management' Guidelines (DEHLG and OPW, 2009)), referencing the OPW flood hazard maps alongside the OPW provided Catchment Flood Risk Assessment Maps (CFRAM) and National Indicative Fluvial Maps (NFIM). The purpose of the FRA report was to identify and assess the risk of flooding to and from the Proposed Development and to propose any necessary mitigation measures to manage flood risk throughout its lifetime, taking the potential effects of climate change into account. Refer to the FRA Report prepared and submitted as part of this planning application for full details.

The key findings of the FRA are as follows:

Wherrew RWI&PS

Since the existing Wherrew Raw Water Pumping Station building is set back and elevated on higher ground, within Flood Zone C (low probability), it does not require a Stage 2 assessment. However, the existing intake structure and the proposed intake works are within Flood zones A/B. Hence a Stage 2 assessment was undertaken for these elements. It concluded that no further FRA is required for Planning Purposes since the Wherrew RWI & PS is classified as water-compatible and its location is functionally dependent on proximity to the waterbody, no further detailed (Stage 3) FRA is required for planning consent under current guidelines.

Based on the findings of Stage 1 FRA, no further flood risk assessment (Stage 2 or 3) is required for Lisglennon WTP, Bonniconlon BPS, Lough Talt Windy Gap BPT, Pipeline Corridor (Pipelines A to E), and Bonniconlon Reservoir.

10.4.6 Hydrogeology

10.4.6.1 Geology

The geology of the area is described in detail in Chapter 9 – Land, Soils and Geology. Marine shelf facies comprising of limestone and calcareous shale underlie the western and northern areas of the Proposed Development, while schists and quartzites of the Argyll Group and granite underlie the eastern areas of the treated water mains, Windy Gap BPT and Lough Talt WTP.

GSI mapping does not record any karst features within the Proposed Development Study area. However, the geophysical survey conducted as part of the Ground Investigation Report (Irish Drilling Limited, 2026) recorded areas of low resistivity at Lisglennon WTP that have been interpreted as argillaceous or muddy limestone but could also indicate karstification within a clean limestone. Based on the results of the desk-based review, site specific geophysical survey and site-specific ground investigation, there is potential for subsurface karst features beneath the Lisglennon WTP and accordingly engineering design solutions have been developed. Refer to Chapter 9 – Land, Soils and Geology Chapter for further details.

10.4.6.2 Aquifer Classification

The GSI has devised a system for classifying bedrock aquifers and gravel aquifers in Ireland based on their size and hydrogeological characteristics. The three main classifications for bedrock aquifers are Regionally Important Aquifers (R), Locally Important Aquifers (L) and Poor Aquifers (P), which are further subdivided based on the productivity of the aquifer. Gravel aquifers are classified as either Regionally Important (Rg) or Locally Important (Lg).

There are two gravel aquifers underlying the Proposed Development, the Ballina Gravel Group 1 and Ballina Gravels Group 2, both of which are classified as Locally Important (Lg). Based on the GSI public data viewer[2], the Proposed Development is underlain by a regionally important karstified aquifer (Rkc), a locally important aquifer (LI) which is generally moderately productive (Lm), a locally important aquifer (LI) which is moderately productive only in local zones and a poor aquifer (PI) which is generally unproductive except for local zones. The regionally important karstified aquifer (Swinford) is comprised primarily of Dinantian Pure Bedded Limestones. More details on the geology of this area are provided in Chapter 9 – Land, Soils and Geology. Figure 10-6 illustrates the bedrock aquifer classification and Figure 10-7 displays the aquifer classification for superficial gravel deposits within the Proposed Development area.

2 Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater web maps. Data and maps (last accessed 06/02/2026)

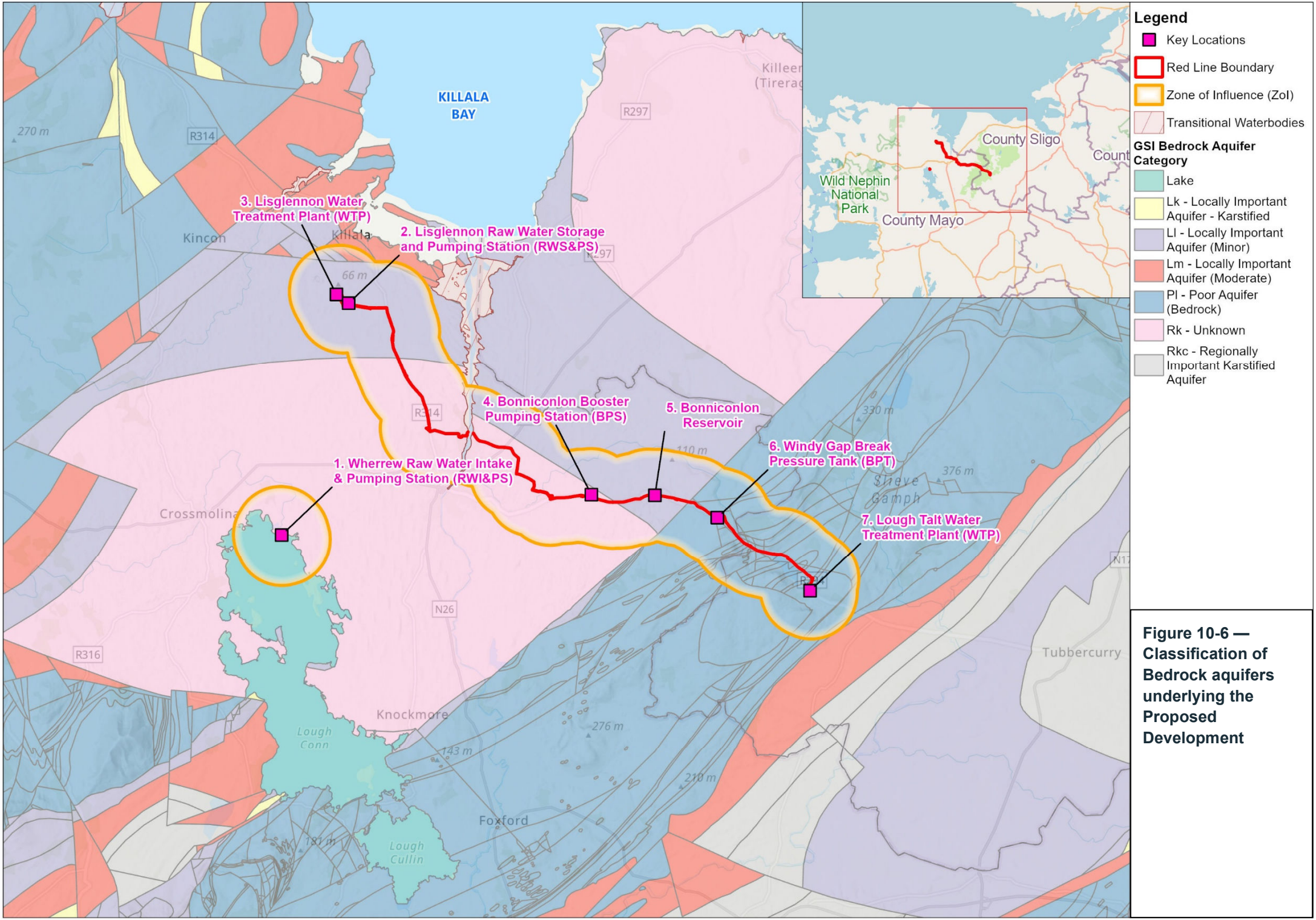


Figure 10-6 — Classification of Bedrock aquifers underlying the Proposed Development

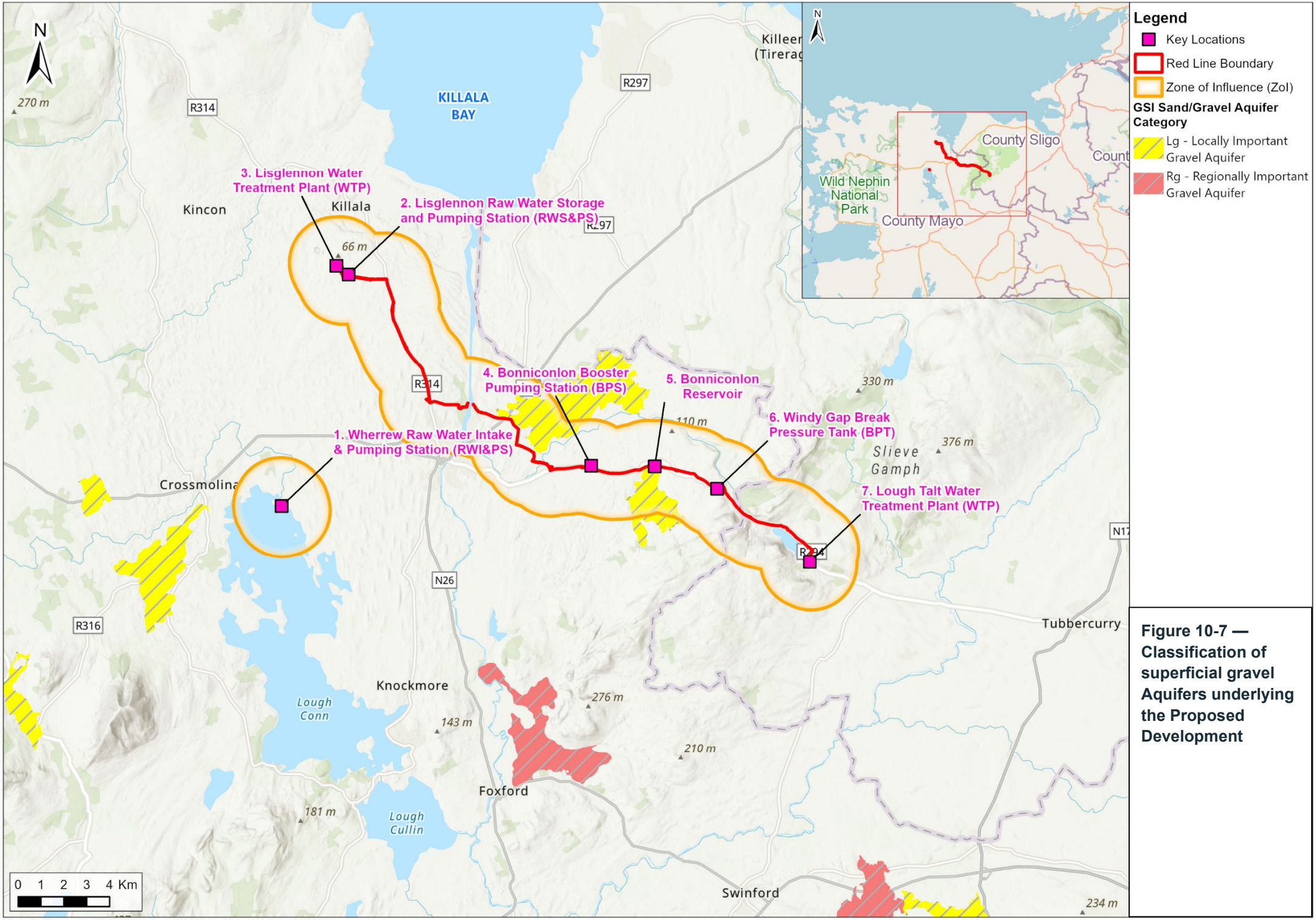


Figure 10-7 — Classification of superficial gravel Aquifers underlying the Proposed Development

10.4.6.3 Groundwater Vulnerability

Groundwater vulnerability is an indication of how easily the aquifer can become contaminated through human activity. It is dependent on the thickness and permeability of the overlying soils and depth of the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is associated with karst landforms as these are a direct pathway for water (and thus any potential contaminates) to enter the aquifer from the surface.

GSI has organised Groundwater vulnerability into five categories – Low (L), Moderate (M), High (H), Extreme (E) and Rock at or near Surface or Karst (X). The attributes determining groundwater vulnerability for categories 'low' to 'extreme' are shown in Figure 10-8 and presented in Table 10-13. Ground investigation works undertaken along the proposed route identified variable depths to bedrock and overburden conditions, confirming GSI designation for groundwater vulnerability as detailed in the table for each element of the Proposed Development. The GI indicates groundwater vulnerability varies across the Study Area from Moderate to Extreme, with higher vulnerability associated with areas of shallow bedrock and permeable granular deposits.

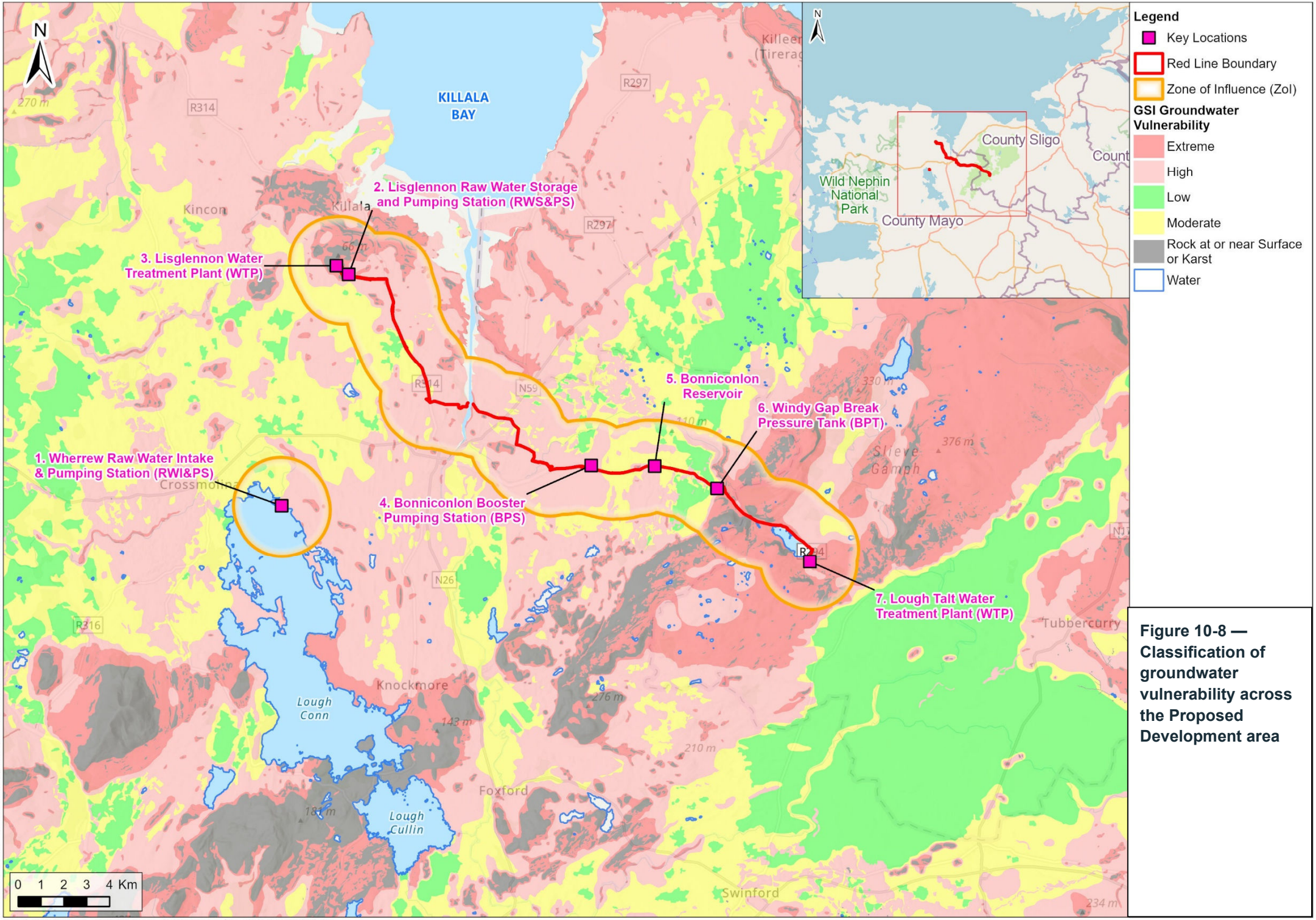


Figure 10-8 — Classification of groundwater vulnerability across the Proposed Development area

Table 10-13 — Groundwater vulnerability rating at Proposed Development structures

Structures	Symbology	Vulnerability Classification	Ground Investigation Findings
Wherrew RWI&PS	H	High	BH-WH01, BH-WH02 and BH-WH02A encountered 1.1–2.7 m of permeable gravelly and cobbly overburden and terminated on possible rock/boulder obstructions. Subsequent rotary boreholes confirmed limestone bedrock at 5.5–7.6 m bgl beneath permeable gravelly deposits and silts, indicating limited aquifer protection and a likely High to Extreme groundwater vulnerability.
Lisglennon RWS&PS	X	Rock at or near Surface or Karst	BH-LR01 and BH-LR02 encountered only 0.6–1.5 m of topsoil and silty overburden with limestone cobbles before terminating on probable/possible rock obstructions. Subsequent rotary boreholes confirming weathered limestone from 1.5–1.7 m bgl and competent limestone bedrock from approximately 3.0–4.1 m bgl, indicating limited overburden cover and a High to Extreme groundwater vulnerability.
Lisglennon WTP	E	Extreme	BH-LG02 to BH-LG06 encountered 1.5–2.7 m of predominantly silty overburden with limestone cobbles, gravel and occasional clay before terminating on possible rock/boulder obstruction; subsequent rotary drilling confirmed weathered limestone from approximately 1.5–2 m bgl and competent limestone bedrock from approximately 3–4 m bgl, indicating limited overburden protection and a High to Extreme groundwater vulnerability.
Proposed booster pumping station at Bonniconlon	H	High	No site-specific borehole data.
Proposed reservoir at Bonniconlon	H	High	BH-M20B encountered 12.5 m of glacial till comprising very stiff gravelly sandy silt with granite and limestone cobbles; bedrock was not encountered within the borehole depth, indicating Moderate to High groundwater vulnerability.
Proposed break pressure tank (BPT) at Windy Gap	H	High	BH-R1 and BH-R2 encountered peat and permeable sand and gravel deposits before terminating on presumed obstructions. Subsequent rotary boreholes confirmed quartz mica schist bedrock at depths ranging from approximately 2 m to 8.6 m bgl, beneath predominantly granular overburden and local

Structures	Symbology	Vulnerability Classification	Ground Investigation Findings
			weathered rock. The shallow and variable bedrock profile, combined with the permeable nature of the overlying deposits, indicates High to Extreme groundwater vulnerability across the site.
Proposed reservoir at Lough Talt WTP	X	Rock at or near Surface or Karst	BH-M33 encountered approximately 8.2 m of predominantly coarse granular sand and gravel overburden providing high permeability.
Lough Talt WTP	X	Rock at or near Surface or Karst	Rotary drilling at BH-T01 to BH-T04 confirmed quartz mica schist bedrock at depths between approximately 1.0 m and 10.0 m bgl beneath gravelly glacial overburden. The shallow and variable rockhead profile, together with the predominantly permeable nature of the overburden, indicates High to Extreme groundwater vulnerability across the site, with localised Extreme vulnerability where bedrock occurs within approximately 1–1.3 m of ground level.
Pipeline	Variable	Variable	Most locations along the route is High vulnerability, reflecting 5–10 m of permeable gravelly superficial deposits over bedrock. The notable exceptions are: • BH-M01 and BH-M13 in the area of Pipeline A and B (Extreme–High due to very shallow rock). • BH-M20/BH-M20A/BH-M20B in the area around Bonniconlon (Moderate), • BH-M22 and BH-M23 (Low–Moderate) along Pipeline D section.

10.4.6.4 Groundwater Recharge

Recharge is the amount of rainfall that infiltrates to ground and replenishes groundwater levels in bedrock and gravel aquifers. It is dependent on:

- Effective rainfall, i.e. Total rainfall less evaporation and run off;
- Transpiration, i.e. Uptake by vegetation; and,
- Aquifer characteristics, e.g. storability and permeability, i.e. how easily the aquifer can accept and store water.

Not all effective rainfall will contribute to recharge due to impermeable materials and surfaces crossed by the Proposed Development such as roads, residential and agricultural buildings and associated drainage and water management infrastructure.

In the Ballina GWB, the expected recharge mechanism is via infiltrations of rainfall through permeable soils as well as outcropping of bedrock. There are no known records of surface karst features such as dolines and sinks but it is anticipated that sink streams will be present and act as fast recharge pathways.

In Bellacorick-Killala GWB, Foxford GWB, Collooney GWB and Killala South GWB, diffuse recharge occurs primarily via rainfall percolating through subsoil and rock outcrops. Due to the low permeability of much of the subsoils such as the peat deposits and bedrock, a high proportion of available recharge discharges to streams. There is a high density of streams which indicates a high proportion of surface runoff is likely. Figure 10-9 illustrates the variability in groundwater recharge volumes across the Proposed Development area and indicates greater recharge of aquifers with higher permeability or presence of fast pathways such as karst features. Generally, groundwater recharge within the RLB varies from less than 50 mm/yr in localised areas of low permeability soils and peatlands to greater than 700 mm/yr in isolated higher recharge zones. The majority of the route corridor is located within areas of moderate recharge, typically between 250 and 500 mm/yr, with the most common recharge classes being 301–450 mm/yr.

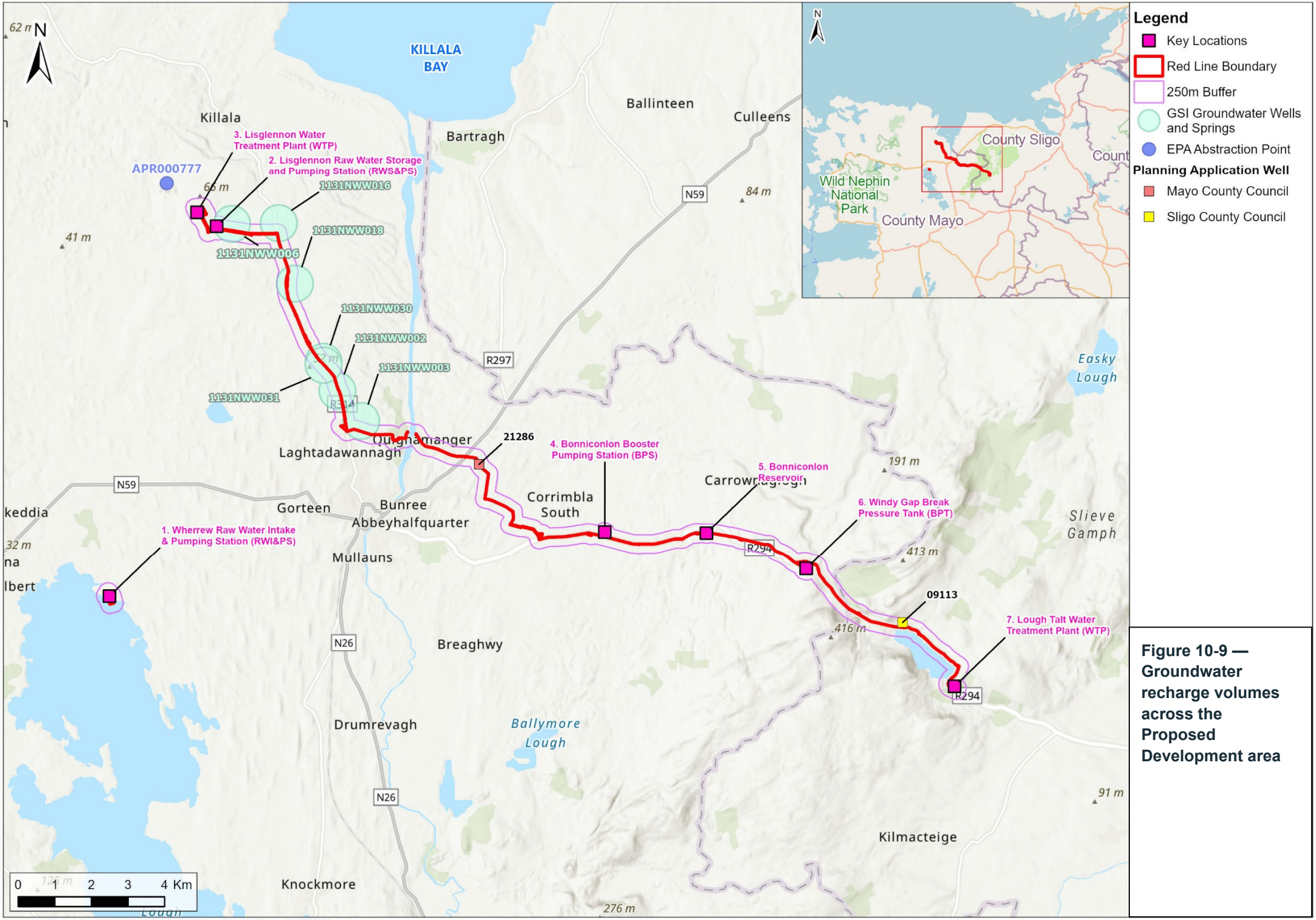


Figure 10-9 — Groundwater recharge volumes across the Proposed Development area

10.4.6.5 Ground Water Bodies

The Study Area encompasses 7 groundwater bodies (GWB). Table 10-14 details the groundwater bodies identified in the Proposed Development, along with their current WFD quality details. The European Communities Environmental Objectives (Groundwater) Regulations, (S.I. No. 9 of 2010) and European Communities Environmental Objectives (Groundwater) Regulations, (S.I. No. 366 of 2016) aim to achieve the environmental objective established for groundwater by Article 4(1) (b) of the WFD, as amended. Under these regulations, the EPA must assign a status of Good or Poor to those groundwater bodies where available data and knowledge permits[3].

Table 10-14 — Ground water bodies

Water body ID	Water body name	WFD status (2019-2024)	WFD risk
IE_WE_G_0041	Bellacorick-Killala	Good	Not at risk
IE_WE_G_0035	Ballina	Good	Not at risk
IE_WE_G_0113	Ballina Gravels Group 1	Good	Not at risk
IE_WE_G_0116	Ballina Gravels Group 2	Good	Not at risk
IE_WE_G_0048	Collooney	Good	Not at risk
IE_WE_G_0034	Foxford	Good	Not at risk
IE_WE_G_0047	Killala South	Good	Not at risk

GSI have compiled GWB descriptions[4] which provide an overview of the GWB's and present a conceptual model of the aquifer. The Ballina GWB has a total area of 265 km^2 and is situated between Crossmolina and Ballina. The GWB is bound by GWBs classified as Poor and Locally Important, namely the Lahardaun GWB to the south-west, Bellacorick-Killala GWB to the north, and the Foxford GWB to the north-east, east and south-east. The Ballina GWB is classified as a regionally important karstified aquifer (Rk), comprised primarily of grey limestone and thin shale of the Ballina Limestone Formation (Upper). The majority of the groundwater flux is anticipated to be in the upper aspect of the aquifer, including the upper weathered zone, which is estimated to be approximately 3 m in thickness; an area of connected fissures/fracturing and an area of discontinuous fissures/fractures. The aquifer is anticipated to be in hydraulic continuity with surface water features, discharging to springs and providing baseflow to streams, rivers and lakes. The GWB is karstic and likely has karst features such as sink streams and dolines which significantly increases the vulnerability of the GWB by providing fast pathways for contaminants. Due to the karstic nature of the GWB, fast flow paths can measure up to several kilometres as a result of conduits or solution enhanced fractures. The locations of karst conduits can be highly unpredictable and may facilitate the flow of large volumes of water.[5]

The Bellacorick-Killala GWB has a total area of 192 km^2 and occupies the lower elevation area between Bellacorick and Killala. The western aspect of the aquifer is bound by an upland area, while the eastern aspect is bound by the coastline. The southern area is bound by the Ballina GWB. The productivity of the aquifer is variable, with the western area being classified as a Poor aquifer (Pl), whilst the eastern area is classified as a locally important aquifer with moderate productivity in local zones (Ll). Two minor areas of the aquifer located west of Killala and between Owenmore and Duvowen are classified as locally important aquifers, which is expected to be moderately productive throughout (Lm). The aquifer is primarily comprised of sandstones, shales and limestones, separated by a series of faults that trend in a north-east to south-west direction. The GWB is expected to provide baseflow to nearby streams.

[3] Environmental Protection Agency (EPA) Geoportal. EPA Maps (last accessed 06/02/2026)

[4] Geological Survey Ireland. Groundwater Body Descriptions. Groundwater bodies (last accessed February 2026)

[5] Geological Survey Ireland (2004) 1st Draft Ballina GWB Description. Microsoft Word - Ballina.doc (last accessed February 2026)

The majority of the groundwater flux is expected to be in the upper weathered area of the aquifer, but there is expected to be a band of interconnected fissures that facilitate flow. On account of the relatively shallow groundwater flow and presence of thin superficial deposits (<3 m), the GWB is more vulnerable to contaminants, which can be transported through weathered and fissured zones. As previously discussed, flow paths are primarily through weathered/fissured zones and are estimated to be up to 300 m, however GSI estimates the majority of connected fissures are anticipated to be less than 150 m.[6]

The Foxford GWB has a total area of 583 km^2 and is situated between the northern area of Castlebar, to the north of Tobercurry. This GWB is bounded to the south by the Swinford GWB and to the north by the coastline and Ballina GWB. The eastern and western boundaries of the GWB act as boundaries for the surface water catchments. The aquifer has varied characteristics, with some area being classified as locally important (Ll and Lm), with the moderately productive areas being located to the western area. Other areas are classified as a poor aquifer (Pl). The main lithology of the aquifer comprises Precambrian quartzites, gneisses and schists and granites and other Igneous intrusive rocks. The majority of groundwater flow is anticipated to be through factures and upper weathered zones. Flow paths in interconnected fractures are thought to measure up to 150 m. Due to the low productivity of the aquifer, it is not expected that the aquifer will contribute significantly to baseflow of surface water bodies. GWB vulnerability is variable due to the varying thickness of overlying deposits which may limit transport of contaminants in non-excavated areas.[7]

Collooney GWB has a total area of 233 km^2 and occupies the area between the east of Bonniconlon to the north of Drumore West. The aquifer does not underly the footprint of the Proposed Scheme but is included within the Study Area. This aquifer is bound to the north by the coastline and to the south by the Balleygawley GWB. The Collooney aquifer is primarily composed of low permeability quartzites, gneisses and schists. Groundwater flow is expected to be concentrated within the upper, weathered part of the aquifer, but smaller quantities of groundwater may flow through deeper fractured zones. The aquifer flows north towards the sea but likely also discharges to streams, lakes and rivers, although small springs and seepages may be present. Therefore, there will no construction activities overlying the aquifer and the risk of effects related to dewatering and transport of contaminants will likely be significantly reduced depending on the hydraulic continuity between GWBs[8].

Killala South GWB has a total area of 27 km^2 and is located between Killala and Killala Bay. The aquifer does not underly the footprint of the Proposed Development but is included within Study Area. The aquifer is bound to the north by the coastline and the Killala North GWB, and is bound to the south by the Bellacorick-Killala GWB. The majority of the GWB is comprised of Dinantian Sandstones, although smaller localised areas are composed of Granite and Dinantian Upper Impure Limestones. 89% of the GWB is classified as a locally important aquifer which is generally moderately productive (Lm). The remaining areas are classified as locally important, with only local areas of moderate productivity (Ll) and poor aquifers with local aquifer of productivity (Pl). The majority of groundwater flux is expected to be within the upper, weathered area of the GWB, which also includes an interconnected fissure network. The GWB lies within the Proposed Development Study Area but does not underlie the infrastructure footprint[9].

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[6] Geological Survey Ireland (2004) 1st Draft Bellacorick-Killala GWB Description. Microsoft Word - bellacorick-Killala.doc. (last accessed February 2026)
[7] Geological Survey Ireland (2004) 1st Draft Foxford GWB Description. Microsoft Word - Foxford.doc. (last accessed February 2026)
[8] Geological Survey Ireland (2004) 1st Draft Collooney GWB Description. Microsoft Word - Collooney.doc. (last accessed February 2026)
[9] Geological Survey (2004) 1st Draft Killala South GWB Description. Microsoft Word - Killala South.doc. (last accessed February 2026)

Table 10-13 — Summary of groundwater body characteristics within the Proposed Development Study Area (Source – GSI Groundwater Body Descriptions, 2004)

Water body name	Transmissivity (m^2/day)	Storativity (%)	Hydraulic gradient	Anticipated Groundwater Depths (m bgl)	Flow Direction
Bellacorick-Killala	1 - 5	0.5	0.01 - 0.005	1 -9	Westerly
Ballina	1 - 200	1 - 2	>0.0005	0 - 20	Variable due to karst features
Collooney	0.1 - 10	<0.5	>0.005	0 - 10	North
Foxford	0.1 - 10	0.5	0.01	0 - 10	Follows topography but generally north
Killala South	100 - 120	2	0.004	0 – 6	Generally north towards coastline

10.4.6.6 Groundwater Levels

A ground investigation (GI) was carried out with borehole, trial pit, slit trench, and dynamic sampling records made. The GI Report accompanies this planning application as Appendix 9-1, Volume 3 of this EIAR. As part of the GI, groundwater levels were recorded at key structures within the Proposed Development. The borehole locations are shown in Appendix 9-1. Table 10-15 provides the groundwater levels recorded at these structures and in which GWB the levels relate to. As groundwater levels were only observed between August and December, seasonally high groundwater levels are unlikely to have been recorded and levels have the potential to fluctuate outside of the recorded range.

Table 10-15 — Ground investigation groundwater level monitoring data at structures within the Proposed Development

Borehole Location	Structure	GWB	Groundwater Level Measurements (m bgl)			
			05/08/2025	27/08/2025	25/09/2025	22/12/2025
BH WH 01	Wherrew RWPS	Ballina	3.93	3.89	3.22	2.38
BH LG 05	Lisglennon WTP	Bellacorick-Killala	2.39	2.35	2.16	1.96
BH LR 01	Lisglennon existing raw water tank	Bellacorick-Killala	4.19	4.20	4.03	3.84
BH R 01	BPT (Windy Gap)	Foxford	6.50	6.55	6.56	6.06
BH T 02	Lough Talt WTP/ treated water tank	Foxford	3.93	3.90	3.95	3.81

The data included in the table above indicates that groundwater levels at these locations are relatively shallow and may be encountered during construction. The GSI groundwater body descriptions indicate that ground level across all GWB's varies and therefore it cannot be discounted that groundwater will be encountered during construction of the proposed pipeline as well as the structures referred to in Table 10-15. Given the karstic nature of the Ballina GWB, in which groundwater is predominantly found in fractures and conduits, encountering groundwater during construction is more likely to be unpredictable.

Outside of the groundwater monitoring completed at the locations in Table 10-15, no other routine groundwater level monitoring programmes were carried out as part of the GI, although it was recorded where groundwater was encountered during boreholes drilling or excavation of trial pits. At many boreholes or trial pits, groundwater was not encountered, although where it was encountered it was typically recorded between 1 m and 4 m bgl. The EPA have a national groundwater monitoring programme which monitors groundwater levels at locations within the Republic of Ireland. No groundwater level monitoring is located in the GWB underlying the Proposed Development.

10.4.6.7 Groundwater Abstractions

The GSI maintains a record of groundwater abstractions consisting of wells and springs, in addition to designated drinking water protection zones (referred to as Source Protection Areas). Based on the GSI database, there are no public water supply or group water scheme abstraction points, or source protection areas, beneath or adjacent to the Proposed Development, excluding Lough Conn and Lough Talt (GSI, 2026).

There were seven GSI wells and springs located within 250 m of the Proposed Development, as summarised in the Table 10-16 and presented in Figure 10-10.

Table 10-16 — The location and nature of GSI wells and springs located within 250 m of the Proposed Development

GSI Well Name	Source Type	Location Accuracy	Depth of hole (m)	Yield (m^3/d)	Use
1131NWW002	Unknown	to within 1 km	43.9	21.8	Agricultural & domestic
1131NWW003	Borehole	to within 1 km	14.0	109.0	Agricultural & domestic
1131NWW030	Borehole	to within 1 km	25.0	22.0	Unknown
1131NWW031	Borehole	to within 1 km	6.7	22.0	Unknown
1131NWW016	Borehole	to within 1 km	45.7	33.0	Unknown
1131NWW018	Borehole	to within 1 km	8.8	22.0	Unknown
1131NWW006	Borehole	to within 1 km	33.2	32.7	Unknown

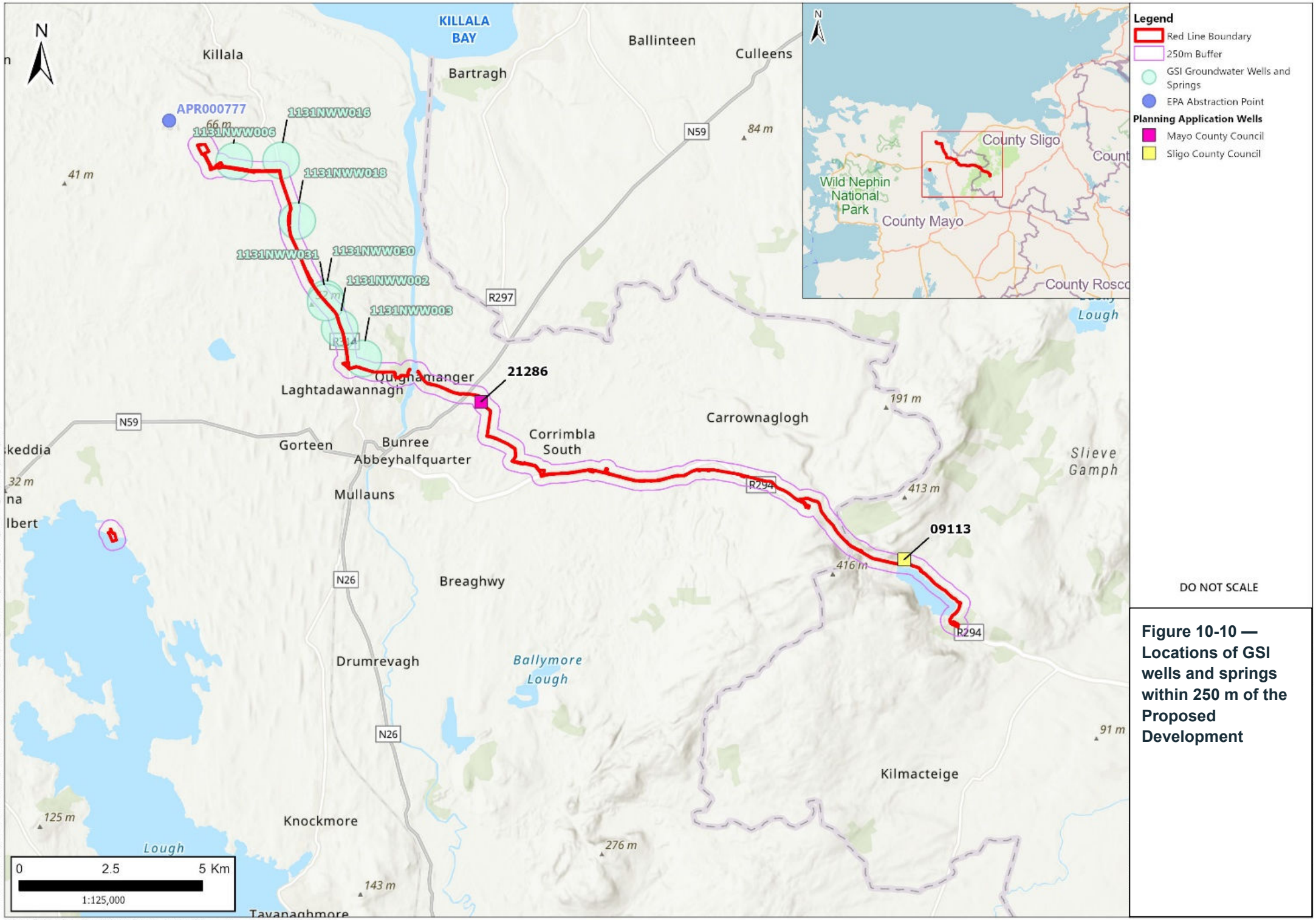


Figure 10-10 — Locations of GSI wells and springs within 250 m of the Proposed Development

Additionally, a review of the EPA Water Abstraction Register (LEAP database) returned a total of 99 abstractions within Counties Mayo and Sligo, comprising a mix of public water supplies, group water schemes, agricultural, industrial and quarrying abstraction. 71 have redacted location details, primarily associated with drinking water supplies (including Uisce Éireann and Group Water Schemes), while the remaining 28 abstractions have publicly available spatial data. Some, but not all, of the redacted abstractions may be indirectly represented in related EPA datasets; including Public Water Supply (Uisce Éireann) layers, Group Water Scheme datasets and Source Protection Areas.

A review of these 28 EPA Water Abstraction Register indicates that no abstractions are located within 250 m of the Proposed Development, and only one abstraction (APR000777 – Mullafarry Quarry Limited) is located within 2 km buffer of the site, situated approximately 1 km northwest of the Lisglennon Water Treatment Plant (WTP) as shown in Figure 10-10. This site comprises a groundwater abstraction from a borehole for quarrying purposes, with a maximum daily abstraction volume of approximately 1,642 m^3/day and an estimated annual abstraction of 250,000 m^3. The abstraction is seasonal, with reduced activity during the summer months. This abstraction is located within a Locally Important (Ll) Aquifer classified as bedrock which is moderately productive only in local zones within the Bellacorick–Killala groundwater body, indicating limited groundwater yield and localised groundwater flow, thereby reducing the likelihood of significant interaction with the Proposed Development. Given the separation distance, the industrial nature of the abstraction, and the locally variable productivity of the underlying aquifer, the potential for significant interaction with the Proposed Development is considered low.

A review of Mayo County Council and Sligo County Council planning records for all lands within 250 m of the RLB identified 122 granted planning applications as detailed in Appendix 10-4 of Volume 3 of this EIAR. All granted applications were reviewed for evidence of groundwater abstractions and private water supplies. Only two private wells were identified from the planning records reviewed. The review identified one private well, associated with Mayo County Council planning application Ref. 21286 (c. 5 m west of the RLB). Although the applicants originally proposed using an existing private well, following a Request for Further Information they amended the proposal to connect to the Irish Water public water main, which satisfied the Planning Authority's concerns. It is unclear if this well is used for any other purposes presently. Application 09113 in Largan, County Sligo, was the other location identified; for the construction of a dormer dwelling house with an ancillary 40 m^2 garage, together with a proprietary effluent treatment system, raised soil polishing filter, and associated site works. The planning documentation identified an existing well (approx. 138 m from north of the RLB) as the source of water supply for the dwelling. A map showing the location of the well was included in the planning file which was used to map its location for the assessment, confirming the presence of the water supply source on site. No other private groundwater wells were identified from the planning records reviewed. This is shown in in Appendix 10-4.

There are no mapped wells in the area of Lough Conn or Lough Talt. The Lough Talt Natura Impact Statement (RPS, 2018) identified monitoring boreholes and piezometers installed for hydrogeological investigations of the lake-fen system; however, no private groundwater supply wells or abstractions are specifically identified or discussed within the Study Area. The investigations demonstrate hydraulic continuity between the lake and the gravel aquifer, with groundwater flow directed towards the lake and groundwater levels influenced by lake level fluctuations. The available studies do not identify any private groundwater supply wells within the Study Area and are principally focused on groundwater interactions supporting the adjacent fen habitat.

On the 2nd of July 2026, a windshield survey was undertaken to identify the wells recorded in the GSI database and those identified during the local authority planning record review. GSI well locations are generally considered accurate to within approximately 1 km; therefore, efforts were made to establish a more precise location for each well during the site visit. Only one potential GSI recorded well, 1131NWW016, was identified in the field. This appears to comprise a pump house located within an agricultural field adjacent to a dwelling and is situated approximately 45 m from the proposed RLB. The mapped locations of 1131NWW006 and 1131NWW018 were within agricultural land; however, no evidence of either well was observed during the survey. The remaining four GSI recorded wells were mapped within more developed areas, but similarly no evidence of their presence was identified. These wells may no longer be in use or may have been decommissioned. In addition, one domestic water supply well associated with the review of the Mayo County Council planning records was identified approximately 5-10 m from the proposed RLB.

No other wells, spring heads, pump houses, water supply infrastructure, or indications of groundwater abstraction were observed within the wider survey area during the windscreen survey. There was also no evidence of any additional private water supplies beyond those identified through the desk study and field inspection. However, it should be noted that the absence of a well from the available records, or the inability to identify a well during the windscreen survey, does not necessarily indicate that no well is present. Private wells may be unregistered, decommissioned, obscured by vegetation or development, or otherwise not readily identifiable during a site inspection. Therefore, the presence of additional unidentified private groundwater abstractions in the area cannot be ruled out.

10.4.6.8 Groundwater Dependent Terrestrial Ecosystems (GWDTE)

As discussed in Chapter 7 – Biodiversity, there are a number of wetland sites present in immediate proximity to the site boundary which are included in Wetland Survey Ireland (WSI) datasets. As groundwater was encountered at varying depths across the Proposed Development, the dependency on groundwater is not clear. Therefore, it is assumed that the wetland sites are in part groundwater fed. These wetland sites are listed in Table 10-17. Refer to Figure 7-9, Figure 7-10 and Figure 7-11 in the Chapter 7 – Biodiversity for wetland locations in relation to the Proposed Development.

Table 10-17 — Wetlands adjacent to the Proposed Development

WSI Wetland Site Name (Code)	WSI Site Evaluation	Wetland Type
Coonealcuraun Farm Pond (WMI_MA726)	F-Rating (Unknown value - survey required)	Lake, Scrub, Wet Grassland
Farrannsculloge Coonealcuraun Cutover (WMI_MA725)	F-Rating (Unknown value - survey required)	Cutover bog
Quignashee Cutover (WMI_MA735)	F-Rating (Unknown value - survey required)	Cutover bog, bog woodland, scrub
Bunnyconnellan East Cutover Complex (WMI_MA596)	F-Rating (Unknown value - survey required)	Cutover bog, dystrophic lake, scrub
Drumsheen Cutover Complex (WMI_MA595)	C+ Rating (County Conservation value)	Cutover bog, scrub, wet grassland, dystrophic lake, acid lake, river, wet heath, transition mire, poor fen
Tullaghglass Largan Mountain Bog (WMI_SO303)	F-Rating (Unknown value - survey required)	Lake, River, Wet Heath, Upland Bog
Tullaghglass Largan South Bog (WMI_SO302)	F-Rating (Unknown value - survey required)	River, Wet Grassland, Cutover Bog, Fen

10.5 Potential Impact of the Proposed Development

10.5.1 Importance of Receptors

An impact assessment has been carried out in line with IGI guidance and is presented below. Based on the baseline assessment, the identified receptors have been given an importance rating in line with the methodology in Section 10.3.2. For surface water bodies, only those with a hydrological connection to the Proposed Development as a receiving water body are assessed. Table 10-18 details the assessment of importance of the surface water receptors as per the guidance and Table 10-19 details the assessment of the groundwater receptors.

Table 10-18 — Importance Assessment of Receptors – Surface water

Receptor	Importance	Rationale
Brusna (North Mayo)_020	Extremely High	The river Brusna forms part of the River Moy SAC, and flows into the Glenree_030, which in turn inputs to the Moy Estuary and Killala Bay/Moy Estuary SAC.
Behy (North Mayo)_010	Extremely High	Behy (North Mayo)_010 contains part of the Lough Hoe Bog SAC, Lough Hoe Bog pNHA. WFD Moderate status. Behy (North Mayo)_010 inputs to the Glenree_030.
Cloonaghmore_050	High	WFD Good status.
Dooyeaghny_or_ Cloonloughan_010	High	WFD Good status. Dooyeaghny_or_Cloonloughan_010 inputs to the Moy Estuary and Killala Bay/Moy Estuary SAC.
Eignagh_010	Extremely High	Eignagh_010 is both an input and a receiving water body for Lough Talt and forms part of the Lough Hoe Bog SAC, Lough Hoe Bog NHA.
Eignagh_020	Extremely High	Eignagh_020 is the receiving water body for Eignagh_010 and is part of the River Moy SAC.
Glenree_010	Extremely High	Glenree_010 originates in the Lough Hoe Bog SAC and Lough Hoe Bog pNHA and flows into the Ox Mountains Bogs SAC, Ox Mountains Bogs NHA.
Glenree_020	Extremely High	Glenree_020 forms part of the River Moy SAC, and flows into the Glenree_030, which in turn inputs to the Moy Estuary and Killala Bay/Moy Estuary SAC.
Glenree_030	Extremely High	Glenree_030 forms part of the River Moy SAC and flows into the Moy Estuary and Killala Bay/Moy Estuary SAC.
Moy_100	Extremely High	Moy_100 is a receiving water body from Lough Conn and forms part of the River Moy SAC, and Lough Conn and Lough Cullin SPA.
Moy_120	Extremely High	Moy_120 forms part of the River Moy SAC, and flows into the Moy Estuary and Killala Bay/Moy Estuary SAC
Moyne_010	Extremely High	Moyne_010 has a hydrological connection to the Killala Bay/Moy Estuary SAC and Killala Esker pNHA
Rathroeen Stream_010	High	WFD Good status. Rathroeen Stream_010 flows into the Moy Estuary and Killala Bay/Moy Estuary SAC
Lough Conn	Extremely High	Lough Conn and Lough Cullin SPA, River Moy SAC, Lough Conn and Lough Cullin NHA
Lough Talt	Extremely High	Lough Talt forms part of the Lough Hoe Bog SAC and Lough Hoe Bog NHA
Lough Conn	Extremely High	Lough Conn and Lough Cullin SPA, River Moy SAC, Lough Conn and Lough Cullin NHA
Moy Estuary	Extremely High	Moy Estuary forms part of the Killala Bay/Moy Estuary SAC. Receiving water body for Dooyeaghny_Or_Cloonloughan_010, Glenree_030, Moy_120, Rathroeen Stream_010

Table 10-19 — Importance Assessment of Receptors – Groundwater

Receptor	Importance	Rationale
Groundwater (Bedrock)		
Ballina GWB – Bellacorick-Killala GWB Foxford GWB -	Extremely High Medium Low	There are three groundwater bodies which underlie the Proposed Development, of which Ballina GWB is classified as a Regionally Important Karstified Aquifer (Rk). The area of the Bellacorick-Killala GWB underlying the site is classified as Locally Important (LI), whereas the Foxford GWB is classified as a Poor aquifer (Pl) with only localised areas of moderate productivity. The groundwater vulnerability is variable across the Proposed Development but ranges from 'High' to 'Rock at or Near Surface/Karst' at the majority of site locations as confirmed by the intrusive ground investigation boreholes (Table 10-13). Groundwater in the vicinity is generally not used for public water supply. Based on the desk study and windscreen survey; only two private wells were identified within 250 m of the RLB. One well, recorded in the GSI database as 1131NWW016 (within the Bellacorick-Killala GWB), is considered likely to be an agricultural and/or domestic water supply and is located approximately 45 m from the proposed RLB. A second well, likely serving a nearby domestic property, was identified approximately 5–10 m from the proposed RLB within the Ballina GWB (with superficial gravel Aquifer Ballina Gravels Group 1 overlying the bedrock aquifer). No other groundwater abstractions have been identified within the Study Area based on the available desk study information and field reconnaissance. However, given that private groundwater abstractions are not comprehensively recorded and may not be readily identifiable during a site inspection, the presence of additional unregistered or undocumented wells in the vicinity cannot be excluded. Groundwater is likely to provide baseflow to the River Moy which is designated as a Special Area of Conservation (SAC). Based on the above, groundwater within the Ballina GWB has been assigned an extremely high importance rating. Whereas, Bellacorick-Killala GWB has been given a medium importance and Foxford GWB has been given a low importance.
Groundwater (Superficial deposits)	High	Groundwater within the superficial deposits was not encountered outside of wetland/groundwater-dependent sites. The wetland sites identified in Table 10-17 may be supported by shallow groundwater flow. Groundwater is shown to be present in the superficial gravel deposits at Lough Talt which support the Vertigo geyeri habitat. While this habitat is not, in itself, identified as a qualifying interest under European or national nature conservation designations, it occurs within the wider Lough Hoe Bog SAC, which is protected under the Habitats Directive. Therefore, groundwater within the superficial deposits has been assigned a High importance rating.
Groundwater Abstractions	Extremely High	There are no public water supplies which abstract from groundwater within the vicinity of the Proposed Development. There are seven private water supplies within 250 m of the Proposed Development, some of which may be used for drinking water purposes.

Receptor	Importance	Rationale
		The use of these supplies for drinking water is not verified but is a conservative assumption. These abstractions likely draw from the Ballina and Bellacorick-Killala GWBs underlying the Proposed Development. Of the seven private water supplies recorded in the GSI database, only one (1131NWW016) was identified during the windscreen survey, where a pump house was observed approximately 45 m from the proposed RLB. No evidence of the remaining GSI-recorded wells was observed in the field. These wells may no longer be operational, may have been decommissioned, or may not be readily identifiable due to their location or condition. In addition, a review of local authority planning records identified one private well in the immediate vicinity of the Proposed Development. This well is assumed to serve a domestic property and is located approximately 5–10 m from the proposed RLB within the Ballina GWB (with superficial gravel Aquifer Ballina Gravels Group 1 overlying the bedrock aquifer). Based on this, a precautionary approach has been adopted and groundwater abstractions have been assigned an importance rating of extremely high.
GWDTEs		
Wetland sites	Medium	There are eight sites within the vicinity of the Proposed Development that may be partially dependent on groundwater. The seven recorded as wetland sites are not designated under EU directives or under national law and are therefore assumed to be of regional importance and are assigned an importance rating of Medium.
Vertigo geyeri habitat	Very High	The Vertigo geyeri has been designated as a protected species under EU directives and therefore, the habitat is assigned an importance rating of Very High.

10.5.2 Potential Effects

10.5.2.1 Construction Phase

The effects arising from construction activities are dependent on the nature of the activities which are discussed in Chapter 3 – Project Description:

- Upgrade of intake at Wherrew RWI&PS (Section 3.2.1);
- Upgrade of Lisglennon RWS&PS and Lisglennon WTP (Sections 3.2.2 and 3.2.4);
- Construction of a new treated water booster pumping station site at Bonniconlon (Section 3.2.6);
- Construction of a new reservoir at Bonniconlon (Section 3.2.9);
- Construction of BPT at Windy Gap (Section 3.2.7);
- Repurpose of Lough Talt WTP for treated water storage (Section 3.2.8);
- Installation of raw water pipeline A (Section 3.2.3); and
- Installation of treated water pipelines B, C, D and E (Section 3.2.5).

These activities have the potential to give rise to effects affecting both surface water and groundwater receptors dependent on these resources. Potential effects which may affect these resources and receptors include:

- Chemical pollution of surface water and groundwater:
  - As a result of accidental spills of hydrocarbons (fuels and oils), drilling fluid, and cementitious materials.
  - As a result of mobilisation of contaminated soils or materials.
- Erosion and sedimentation:
  - As a result of earthworks, drilling, pipe-jacking, excavations, stockpiling of overburden, ground disturbance and transport of sediment to water bodies. Disturbance of peat substrate could result in contamination of surface and groundwater with peaty sediments. These effects would lead to increased turbidity and changes in pH.
- Alteration to groundwater flows and creation of preferential pathways:
  - Earthworks may alter groundwater flows. Flow paths may be disrupted by sub-surface water controls such as physical cut-offs and dewatering.

10.5.2.1.1 Watercourse Crossings

There are 30 surface water feature crossings which have been identified along the pipeline route, comprising 18 EPA-identified watercourses and 12 field drains, these are listed in Table 10-20. These are also described in Chapter 7 – Biodiversity. EPA watercourses are shown in Figure 10-11. The locations of these surface water features were validated during site surveys and site investigations and assessed for ecological potential. Where a risk of impact to the watercourse (e.g. aquatic life or habitats) has been identified, the watercourse will be crossed using trenchless techniques, such as pipe jacking or directional drilling, or via existing crossing infrastructure.

There are no works proposed within or under the River Moy, instead the Proposed Development will tie-in to an existing 450 mm diameter pipeline crossing the River Moy. The Glenree/Brusna River will be crossed via trenchless techniques, most likely Horizontal Directional Drilling (HDD).

For other small order watercourses, the trenchless technique ‘pipe jacking’ is a preferred methodology for crossing. Open cut methodology is the preferred option for crossing field drains, many of which are dry and are likely to be dry at the time of construction. Figure 10-11 details the location of the surface water crossing referred to in Table 10-20.

Table 10-20 — Surface Water Feature Crossings

Section	EPA Water course Name (WFD River Water Body)	Map Ref.	On Road / Off Road	Chainage	Crossing Methodology
Pipeline B	Moyne (Moyne 010)	1	On	880	Open Cut
Pipeline B	Newtonwhite (Rathroeen Stream 010)	2	On	2600	Trenchless
Pipeline B	Broadlands and Knockafars (Rathroeen Stream 010)	3	On	2900	Open Cut
Pipeline B	No Name (Rathroeen Stream 010)	4	On	3520	Trenchless
Pipeline B	Abbeytown (Rathroeen Stream 010)	5	Off	3720	Trenchless
Pipeline B	No Name (Rathroeen Stream 010)	6	Off	3880	Trenchless
Pipeline B	Field Drain (Rathroeen Stream 010)		Off	5630	Open Cut
Pipeline B	Illinamuck	7	On	8020	Open Cut

Section	EPA Water course Name (WFD River Water Body)	Map Ref.	On Road / Off Road	Chainage	Crossing Methodology
	(Moy 120)				
Pipeline C	Moy Estuary (Moy Estuary)	8	On	10200	Existing pipe
Pipeline C	Field Drain of Quignamanger (Dooyeaghny or Cloonloughan 010)		On	11830	Trenchless
Pipeline C	Field Drain (Dooyeaghny or Cloonloughan 010)		On	12610	Open Cut
Pipeline C	Glenree / Brusna (Glenree 030)	9	Off	15280	Trenchless
Pipeline C	No Name (Behy (North Mayo) 010)	10	On	16860	OC or Trenchless
Pipeline C	Fiddaun (Behy (North Mayo) 010)	11	Off	17220	Trenchless
Pipeline D	Srafaungal (Behy (North Mayo) 010)	12	Off	17850	Trenchless
Pipeline D	Bunnyconnellan West (Behy (North Mayo) 010)	13	Off	20470	Trenchless
Pipeline D	Field Drain (Behy (North Mayo) 010)		On	21050	Open Cut
Pipeline D	Srafaungal (Behy (North Mayo) 010)	14	Off	21700	Trenchless
Pipeline E	No Name (Glenree 010)	15	On	25730	Open Cut
Pipeline E	Field Drain (Glenree 010)		On	25810	Open Cut
Pipeline E	No Name (Glenree 010)	16	On	25970	Trenchless
Pipeline E	Glenree (Glenree 010)	17	Off	26280	Trenchless
Pipeline E	Field Drain (Eignagh 010)		On	27175	Open Cut
Pipeline E	Field Drain (Eignagh 010)		On	28830	Open Cut
Pipeline E	No Name (Eignagh 010)	18	Off	28070	Trenchless
Pipeline E	Field Drain		On	28350	Open Cut

Section	EPA Water course Name (WFD River Water Body)	Map Ref.	On Road / Off Road	Chainage	Crossing Methodology
	(Eignagh 010)				
Pipeline E	Field Drain (Eignagh 010)		On	28730	Open Cut
Pipeline E	Field Drain (Eignagh 010)		On	28950	Open Cut
Pipeline E	Field Drain (Eignagh 010)		On	29295	Open Cut
Pipeline E	Field Drain (Eignagh 010)		Off	29470	Open Cut

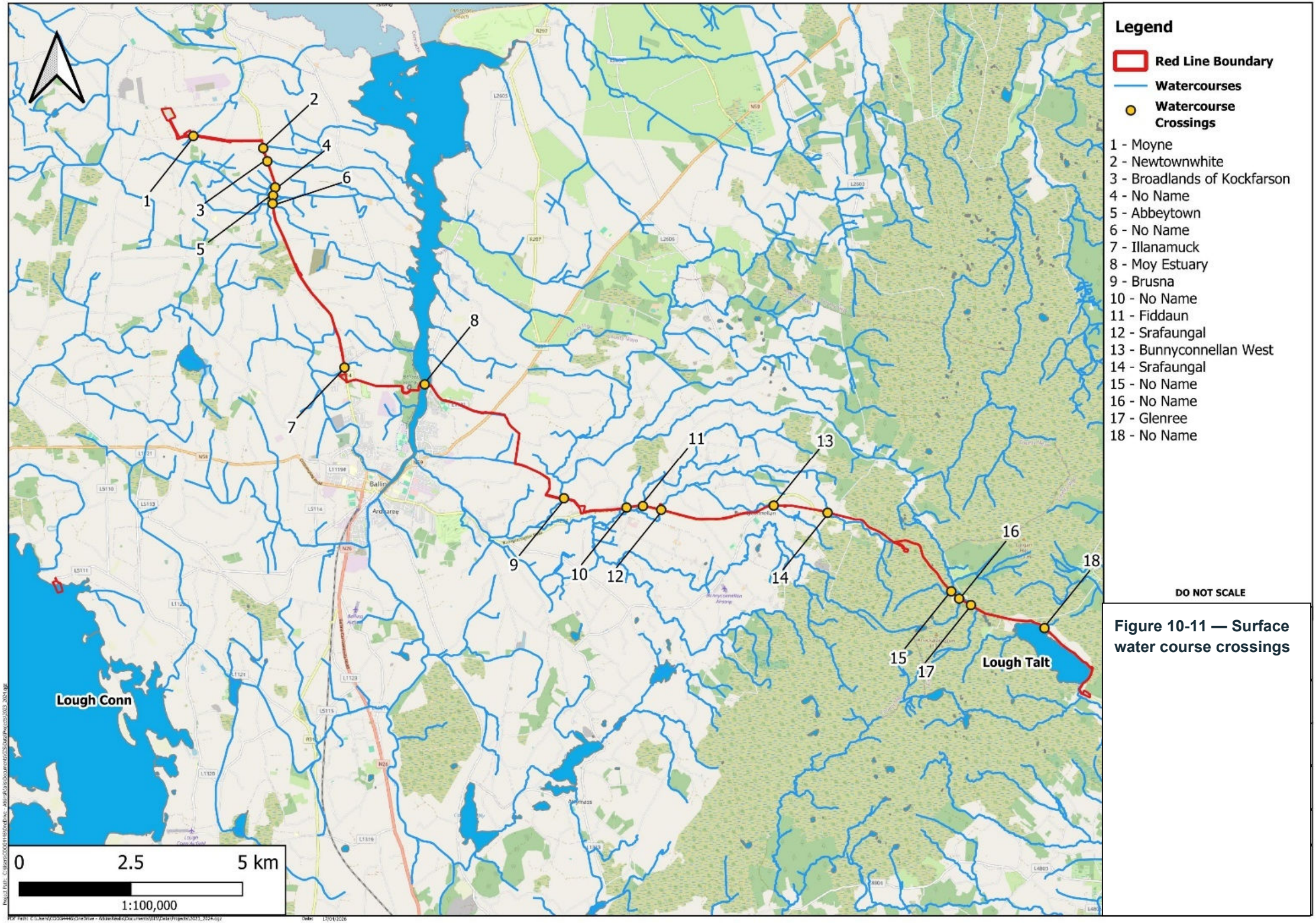


Figure 10-11 — Surface water course crossings

10.5.2.2 Operation and Maintenance Phase

The operation of this Proposed Development is intended to be ongoing with no intended decommissioning phase and as such will be long-term. Throughout this phase, the development activities are considered to be of a lesser magnitude considering there are no planned earthworks, only activities associated with the operation and maintenance of the infrastructure. Potential effects include:

- Continued erosion and sedimentation of receptors as a result of ongoing ground disturbance associated with runoff from areas of made ground.
- Alteration of natural flow pathways as a result of below ground structures and areas of hardstanding.
- Chemical pollution as a result of accidental spill of chlorinated water associated with scour activities.
- Chemical pollution as a result of accidental spills of treatment chemicals, fuels and oils associated with maintenance activities.
- Increased abstraction in the case of Lough Conn and ceased abstraction in the case of Lough Talt.
- The intake screen will be inspected and cleaned as required, with routine cleaning anticipated to be undertaken approximately annually, subject to operational experience, monitoring results and raw water conditions.

10.5.2.2.1 Drainage design

Proposed drainage management after construction management of stormwater, runoff and wastewater (as appropriate) for each site in the Proposed Development is described in Table 10-21 below with more details of the existing infrastructure in Section 3.2 of the Project Description.

Table 10-21 — Drainage design

Site	Planned drainage
Wherrew RWI&PS	A linear slotted drain will be installed at the interface between the proposed and existing access roads to manage surface water runoff from the existing hardstanding area. This will be connected into the existing local on-site drainage network. Surface water runoff from the proposed access road will be managed through a new surface water management system. This will comprise a linear drain, at the interface between the access road and the new intake structure, stormwater manholes, a petrol interceptor and a proposed soakaway. The proposed soakaway is located within the channel infill area and will consist of free draining stones to allow faster percolation.
Lisglennon RWS&PS	No changes are proposed to the stormwater management.
Lisglennon WTP	The existing surface water management system consists of a conventional system of gullies and drains across the road, running towards soakpits along existing roads. Additional stormwater run-off from proposed buildings, hardstanding and roads, will be conveyed by a new pipe network to petrol interceptors and flow into ponds and soakaways proposed at different locations within the site. Some of the existing soakaways will be abandoned with surface water captured and redirected to the new ponds and soakaways.
Bonniconlon BPS	The proposed storm water management system consists of a conventional system of gullies and drains along the access road. Stormwater run-off from buildings, hardstanding and roads, will be collected by this new storm water network, conveyed by the proposed storm water pipe network to a petrol interceptor before draining into a proposed pond located at the southern boundary of the Bonniconlon BPS site.
Windy Gap BPT	The bog habitat at this site is groundwater-dependent and, to a lesser extent, reliant on rainfall. No site drainage is proposed, allowing rainfall to continue

Site	Planned drainage
	infiltrating the ground as occurs at present. Runoff from impermeable surfaces, i.e. the reservoir tank roof, hardstanding areas, roof of kiosks, will be minimal and can dissipate into the surrounding peat. The BPT will be a precast concrete tank. To manage tank roof runoff and ensure it is directed into the surrounding peat rather than flowing down the tank sides, an impermeable membrane will be installed around the tank at an approximate depth of 500 mm bgl. This will be overlain by an approx. 50 mm layer of sand, followed by an approx. 450 mm layer of salvaged peat. Rainfall within the Windy Gap BPT site will continue to infiltrate and drain into the bog habitat, as occurs under existing conditions.
Lough Talt WTP	It is anticipated that the Proposed Development will result in a small increase in surface water entering the system, therefore the attenuation pond will be extended (approx. 8%) to enable the same discharge rate from the site to be maintained. New pipe network and gullies will be installed within the site to collect surface runoff from new impermeable areas. As part of the proposed works, wastewater flows from the retained welfare facilities will be diverted to a new wastewater manhole or holding arrangement fitted with a Bauer connection. Wastewater will be collected and removed from site by tanker for treatment at an appropriately authorised facility. Any redundant wastewater infrastructure affected by the works will be isolated or decommissioned.
Bonniconlon Reservoir	There is minimal surface runoff from the proposed works. Stormwater generated from the new tank roof will be collected into a French drain circling the base of the proposed tank's berm, which will be consist of a shallow trench with single sized free draining stones wrapped in geotextile. Stormwater will percolate into the ground.

10.5.3 Assessment of Potential Effects

Effects of the Proposed Development, prior to mitigation measures on water environment receptors throughout the construction, operation & maintenance and decommission phases at the Lough Talt WTP, have been assessed as per the methodology and terminology given in Section 10.3 and presented in Table 10-22 and Table 10-23.

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10.5.3.1 Assessment of potential effects on surface water

Table 10-22 — Impact assessment – Surface Water

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
Construction Phase						
Brusna (North Mayo)_020	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Small adverse	Significant	Activities in the Brusna (North Mayo)_020 subcatchment are limited to installation of the treated water Pipeline C with no watercourse crossings within the river sub basin. Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area. All construction related activities will be carried out in accordance with the project Construction Environmental Management Plan (CEMP), which will include measures for pollution prevention, sediment and erosion control, and incident response. The implementation of the CEMP will ensure that the risk of adverse effects on surface water receptors is minimised.
Behy (North Mayo)_010	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and	Negative, Temporary	Moderate Adverse	Profound	Activities in the Behy (North Mayo)_010 subcatchment include installation of treated water Pipeline D (with watercourse crossings using trenchless and open cut techniques see Table 10-16 above), construction of a new treated water booster pumping station, and construction of a new reservoir at

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
		creation of preferential pathways				Bonniconlon, and construction of BPT at Windy Gap at the border of the catchment with Glenree_010. Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area. Construction of a new treated water booster pumping station, and construction of a new reservoir at Bonniconlon will involve a greater amount of construction activities including earthworks. This increase in earthworks and general site activity increases the likelihood of accidental contaminant spillages and will have larger areas of excavated ground which can generate larger volumes of silt laden water. Windy Gap BPT is situated in wetland - Bunnyconnellan East Cutover Complex. Groundwater monitoring at this location indicates that the water table is encountered approximately 6 m bgl which indicates that excavations are unlikely to encounter groundwater. However, excavation of the bogland may result in localised mobilisation of peaty sediment. There is potential for accidental chemical spillages and temporary disruption of flow paths caused by excavated and disturbed ground. Effects are likely to be small in scale and localised due to the relatively small scale of the infrastructure.
Cloonaghmore_050	High	Chemical pollution	Negative, Temporary	Negligible	Imperceptible	Cloonaghmore_050 is adjacent to the Lisglennon WTP site, with majority of the works taking place in the Moyne_010 water body.

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
		Erosion and sedimentation Alteration of flows and creation of preferential pathways				As excavations for this site will take place outside the boundary of Cloonaghmore_050 sub basin, it is unlikely that excavation works will impact the water body. (not including the treated water pipeline) are intended to be between 3 and 4 m bgl, it is likely that groundwater will be encountered at Lisglennon WTP and dewatering will be required during construction. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area.
Dooyeaghny_or_ Cloonloughan_010	High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Small Adverse	Moderate/ Slight	Activities in the Dooyeaghny_or_ Cloonloughan_010 subcatchment are limited to installation of the treated water Pipeline C (with crossing of two field drains as per Table 10-20). Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area.
Eignagh_010	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Small Adverse	Significant	Activities in the Eignagh_010 subcatchment are installation of the treated water Pipeline E (with crossing of seven field drains and one stream as per Table 10-20) and repurpose of Lough Talt WTP for treated water storage. Given site constraints and ground conditions, including shallow bedrock, the reservoir tank will be constructed predominantly above ground on prepared foundations, therefore there will be minimal groundworks.

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
						Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area.
Eignagh_020	Extremely High	Chemical pollution Erosion and sedimentation	Negative, Temporary	Negligible	Imperceptible	Effects on Eignagh_020 would be downstream effects from Eignagh_010 and as such would be imperceptible.
Glenree_010	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Moderate Adverse	Profound	Activities in Glenree_010 subcatchment are installation of the treated water Pipeline E (with crossing of three streams and one field drain using trenchless and open cut methods as per Table 10-20) and construction of BPT at Windy Gap at the border of the catchment with Behy (North Mayo) 010. Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area. Wind Gap BPT is situated in wetland - Bunnyconnellan East Cutover Complex. Groundwater monitoring at this location indicates that the water table is encountered approximately 6 m bgl which indicates that excavations are unlikely to encounter groundwater. However, excavation of the bogland may result in localised mobilisation of peaty sediment. There

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
						is potential for accidental chemical spillages and temporary disruption of flow paths caused by excavated and disturbed ground. Effects are likely to be small in scale and localised due to the relatively small scale of the infrastructure.
Glenree_020	Extremely High	Chemical pollution Erosion and sedimentation	Negative, Temporary	Negligible	Imperceptible	Effects on Glenree_020 would be downstream effects from Glenree_010 and as such would be imperceptible.
Glenree_030	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Moderate Adverse	Profound	Activities in Glenree_030 subcatchment are installation of the treated water Pipeline C, including the watercourse crossing of the River Brusna. Horizontal directional drilling (HDD) will be used to cross the River Brusna, with drilling fluids which are non-toxic to aquatic organisms to be used. HDD is described in detail in Chapter 3 – Project Description, Section 3.2.5.4.2. Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area.
Moy_100	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of	Negative, Temporary	Small Adverse	Significant	Moy_100 is the receiving water body for Lough Conn and the location of the upgrade of the intake works at Wherrew. Utilisation of the car park at Wherrew as a site compound will involve construction activities including earthworks. This increase in earthworks and general site activity increases the likelihood of accidental contaminant spillages and will have

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
		preferential pathways				larger areas of excavated ground which can generate larger volumes of silt laden water. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area.
Moy_120	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Small Adverse	Significant	Activities in the Moy_120 subcatchment are limited to installation of the treated water Pipeline B, with one open cut crossing of Illinamuck stream. Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area.
Moyne_010	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Moderate Adverse	Profound	Activities in Moyne_010 include installation of the treated water Pipeline B, with one open cut crossing of the Moyne stream, and upgrade of the Lisglennon WTP site. As excavations (not including the treated water pipeline) are intended to be between 3 and 4 m bgl, it is likely that groundwater will be encountered at Lisglennon WTP and dewatering will be required during construction. The pipeline route in this location is across fields. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area.

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
Rathroeen Stream_010	High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Small Adverse	Moderate/ Slight	Activities in the subcatchment are limited to installation of the treated water Pipeline B (with watercourse crossings of streams and field drains using open cut and trenchless techniques). Rathroeen Stream_010 is adjacent to the Lisglennon WTP site, with majority of the works taking place in the Moyne_010 water body. As excavations (not including the treated water pipeline) are intended to be between 3 and 4 m bgl, it is likely that groundwater will be encountered at Lisglennon WTP and dewatering will be required during construction. Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. The footprint of the pipeline is limited and the depth at which it will be laid is shallow. In the unlikely event that fuels, oils or cement are accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area.
Lough Conn	Extremely High	Chemical pollution Erosion and sedimentation	Negative, Temporary	Moderate Adverse	Profound	Potential effects associated with the construction of the intake pipeline works within Lough Conn arise primarily from in lake works required to install the 165 m pipeline and intake structure (see Chapter 3 Project Description, Section 3.2.1). These works include minor grading and levelling of a narrow strip of lakebed, placement of bedding and protective stone, and installation of the intake unit using pontoons and excavators. As a result, there is potential for mobilisation of silt and sediment, and spillage of fuels or oils causing turbidity and deterioration of water quality. These effects will be localised to the immediate surroundings of the intake pipeline works. Given the extremely high sensitivity of Lough Conn, these

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
						impacts have been assessed as temporary and localised, with a moderate adverse magnitude, resulting in a moderate adverse significance. However, the short duration of works, limited footprint, and implementation of mitigation measures (including CEMP controls and sediment management measures) will ensure that effects remain confined to the immediate vicinity of the works and do not result in significant long-term impacts on the receiving environment.
Lough Cullin	Extremely High	Chemical pollution Erosion and sedimentation	Negative, Temporary	Negligible	Imperceptible	Effects on Lough Cullin would be downstream effects from Lough Conn and as such would be imperceptible.
Lough Talt	Extremely High	Chemical pollution Erosion and sedimentation	Negative, Temporary	Negligible	Imperceptible	No activities are proposed in the Lough Talt water body. Effects on Lough Talt would be downstream effects from Eignagh_010 and as such would be imperceptible.
Moy Estuary	Extremely High	Chemical pollution Erosion and sedimentation	Negative, Temporary	Negligible	Imperceptible	Moy Estuary is the receiving water body for Dooyeaghny or Cloonloughan_010, Glenree_030, Moy 120, Moyne_010 and Rathroeen Stream_010. Effects on Moy Estuary would be downstream effects from these and as such would be imperceptible.
Operation and Maintenance Phase						
Brusna_020 Eignagh_010 Glenree_010 Moy_100 Moy_120 Moyne_010 Lough Conn	Extremely high	Chemical pollution	Negative, Temporary	Small Adverse	Significant	For all pipelines, scour valves are located at low points along the route. When carrying out emergency works, a section of the pipeline will need to be isolated and emptied in a controlled manner by opening the dedicated scour valve. Maintenance activities such as scouring will be infrequent and undertaken in a manner that avoids release of chlorinated water to the environment. The incorporation of advanced telemetry and automated control will enable continuous monitoring of flows,

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
Rathroeen Stream_010	High	Chemical pollution	Negative, Temporary	Small Adverse	Moderate/ Slight	pressures and water quality, allowing for rapid response to any potential issues and ensuring the system operates within defined parameters at all times.
Behy (North Mayo)_010	Medium	Chemical pollution	Negative, Temporary	Small Adverse	Slight	
Lough Conn	Extremely high	Erosion and sedimentation Abstraction Intake screen maintenance	Negative, Temporary	Small Adverse	Significant	Maintenance of the intake pipeline at Lough Conn may also give rise to localised disturbance of lakebed sediments and a temporary increase in suspended solids. However, such activities will be infrequent, of short duration, and undertaken in accordance with appropriate sediment control measures. As such, any effects will be temporary and confined to the immediate vicinity of the works. The effects of the increased abstraction are discussed below in Section 10.5.3.1.1.
Lough Conn	Extremely high	Erosion and sedimentation	Positive, Long term	Small Positive	Significant	Installation of the intake pipe below the sediment zone will reduce the need for silt clearance from the intake and thus reduce the potential for disturbance of sediments.
Lough Cullin	Extremely high	Abstraction	Negative, Temporary	Small Adverse	Significant	Abstraction effects are discussed in Section 10.5.3.1.1
Lough Talt	Extremely High	Abstraction	Positive, Permanent	Small	Significant	The effects of the cessation of abstraction are discussed below in Section 10.5.3.1.2.
Eignagh_010 Moy_100 Moyne_010	Extremely high	Chemical pollution	Negative, Temporary	Negligible	Imperceptible	Surface water management where hardstanding will be in place as well as a drainage system to capture accidental spills of fuels and oils. As part of good practice, pollution prevention measures will be implemented to address accidental spills,

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
Cloonaghmore_050 Rathroeen Stream_010	High	Chemical pollution	Negative, Temporary	Negligible	Imperceptible	erosion and sediment transport such as bunded areas, emergency spill procedures. Full details of pollution prevention measures will be outlined in the site Standard Operational Procedures (SOPs) and associated Emergency Response Plan, which will govern maintenance activities and incident response during operation.
Behy (North Mayo)_010	Medium	Chemical pollution	Negative, Temporary	Negligible	Imperceptible	

10.5.3.1.1 Assessment of drinking water abstraction at Lough Conn

In addition to the above effects, the effect of the increased abstraction on they hydrology of Lough Conn was assessed in the accompanying report Lough Conn Abstraction Assessment (Appendix 10-3, Volume 3 of the EIAR). The assessment approach also considered the compliance of the existing abstraction against available WFD compliance targets.

The modelled data suggested that there is unlikely to be any change in shoreline habitat quality and interaction with wetland habitats that support the protected bird communities. There is also unlikely to be any water quality changes as a result of the change in abstraction regime.

The compliance assessment also indicates that river flows in the River Moy will remain compliant with the target for achieving Good status.

Based on the available data it was also concluded that lake levels and river flows will remain compliant with WFD standards for achieving Good to High status. As such, there is unlikely to be any change in geomorphological process or a loss of habitat as a result of the change in abstraction regime.

As changes in river flow will not be discernible, there is unlikely to be any fragmentation of habitats or barriers to migration, especially during autumn and winter flows (when Atlantic salmon and lamprey species – which are the Qualifying Interests of the SAC – are undertaking spawning migration).

10.5.3.1.2 Assessment of drinking water abstraction at Lough Talt

The effects of the current abstraction for drinking water on the Lough Talt water body are discussed in Chapter 7 – Biodiversity, Section 7.3.7. Upon cessation of the abstraction from Lough Talt, lake levels may be expected to remain higher than currently during drought periods, reducing drawdown effects on the surrounding groundwater system. As the lake functions as a hydraulic boundary for groundwater flow within the fen, maintaining higher lake levels will help preserve artesian conditions, allowing groundwater to continue discharging to the fen surface. This is expected to improve the hydrological conditions within the fen habitat, supporting its ecological integrity and enhancing the potential for restoration of habitat suitable for *V. geyeri* and other groundwater-dependent species. Therefore, in this context, the effects of the Proposed Development on Lough Talt are expected to be positive, significant and permanent.

10.5.3.2 Assessment of potential effects on groundwater

Table 10-23 — Impact Assessment – Groundwater

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
Construction Phase						
Groundwater (Bedrock)	Ballina GWB - Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Small adverse	Significant	In the unlikely event that fuels, oils or cement is accidentally spilled, the spillages are likely to be relatively small in volume and confined to a localised area. The exception to this is where karst features are present which may act as fast pathways for contaminants. The Proposed Development spans a large area, however, major areas of earthworks are unlikely to take place along the proposed pipeline given the small footprint of the pipeline and the shallow depth at which the pipeline will be laid. Effects along the pipeline route are minimised where the pipeline is laid alongside the existing road network as it will be installed within the road sub-basement materials. As these materials do not facilitate groundwater flow, there is little likelihood of excavations causing disruption to groundwater flows or facilitating transport of contaminants into groundwater. Areas including Lisglennon RWPS and WTP, Bonniconlon BPS and Bonniconlon reservoir, Windy Gap BPT and Lough Talt WTP will involve a greater amount of construction activities including earthworks. This increase in earthworks and general site activity increases the likelihood of accidental contaminant spillages and will have larger areas of excavated ground which can generate larger volumes of silt laden water. At these areas, groundwater was recorded between 1.96 and 6.50 m bgl. As excavations (not including the treated water pipeline) are intended to be between 3 and 4 m bgl, it is likely
	Bellacorick-Killala GWB – Medium		Negative, Temporary	Small adverse	Slight	
	Foxford GWB - Low		Negative, Temporary	Small adverse	Imperceptible	

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
						that groundwater will be encountered at Lisglennon WTP and dewatering will be required during construction. In locations where groundwater is not likely to be encountered, the water table is relatively shallow which limits the capacity for contaminants and silt laden water was to be attenuated/diluted. Significant dewatering across the other aspects of the Proposed Development is not anticipated. One likely domestic well was identified approximately 5–10 m from the proposed RLB (although there is also a mains connection) associated with the Ballina GWB and a second likely domestic supply (GSI well 1131NWW016) is located approximately 138 m from the proposed RLB within the Bellacorick-Killala GWB. As these abstractions may be used for potable water supply, they are considered highly sensitive receptors. Any contamination reaching groundwater has the potential to adversely affect water quality at these supplies. However, potential contamination events associated with the Proposed Development are expected to be localised in extent and limited in volume. Given the limited footprint and shallow nature of the proposed excavations, any effects on groundwater quality or groundwater flow are anticipated to be temporary and spatially restricted.
Groundwater (Superficial)	High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Small Adverse	Moderate/ Slight	The Ground Investigation Report (Appendix 9.1) indicates that groundwater within the superficial deposits is not widely present across the Proposed Development and localised to the areas of peat at Windy Gap BPT and the gravel deposits along the northern banks of Lough Talt. Windy Gap BPT is situated in wetland - Bonniconlon East Cutover Complex. Groundwater monitoring at this location indicates that the water table is encountered approximately 6 m bgl which indicates that excavations are unlikely to encounter groundwater. However, excavation of the bogland

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
						may result in localised drainage of the peat. There is potential for accidental chemical spillages and temporary disruption of flow paths caused by excavated and disturbed ground. Effects are likely to be small in scale and localised due to the relatively small scale of the infrastructure. Disruption of groundwater flow in the superficial gravel deposits to the north of Lough Talt are unlikely to be affected by the Proposed Development as the treated water pipeline will be installed in the road sub-basement materials. There is a risk of accidental spillages and sedimentation, but the likely effect is significantly reduced on account of the small scale of works required at this location and the fact that only road material is planned to be excavated.
Groundwater Abstractions	Extremely High	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Large Adverse	Profound	Given the potential presence of karst features, the direction of groundwater flow is not certain. Additionally, the locations of the private water supplies are only accurate to 1 km. This makes establishing proximity and hydraulic connection between the Proposed Development and the supplies difficult. On this basis, it is assumed that the supplies are hydraulically connected to the Proposed Development. The domestic wells identified approximately 5 m and 138 m from the proposed RLB identified through the local authority planning record review have the potential for significant effects. Due to the proximity to the Proposed Development, these abstractions may be vulnerable to changes in groundwater quality arising from accidental spillages, sediment-laden runoff, or disturbance of groundwater pathways during construction. Of the seven private water supplies recorded by the GSI, the larger risk of effect lies with 1131NWW016 (possibly approx. 138 m from the RLB based on the windscreen survey) and 1131NWW006 which are situated within a 2 km radius of

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
						Lisglennon RWPS and WTP which will involve larger scale site activities including earthworks and dewatering which have the potential to disrupt flow of groundwater and introduce silt laden water to ground. A higher degree of site activities also increases the likelihood of accidental spills which are more likely to infiltrate to groundwater given the shallow groundwater levels. Should karst features be present, these may act as fast pathways for contaminants. The other five abstractions are less likely to be affected given the treated water pipeline will be laid within the sub-basement materials of the road network. There is risk of chemical pollution in instances where hydrocarbons spilled to ground are transported in groundwater to the abstractions. However, the risk of this is reduced given the limited extent of the works at this location.
GWDTEs	Wetland sites - Medium	Chemical pollution Erosion and sedimentation Alteration of flows and creation of preferential pathways	Negative, Temporary	Small Adverse	Slight	All seven wetland sites discussed are in immediate proximity to the Proposed Development. Of these seven sites, five sites; Coonealcuraun Farm Pond, Farrannsculloge Coonealcuraun Cutover, Drumsheen Cutover Complex, Tullaghglass Largan Mountain and Tullaghglass Largan South Bog border the Proposed Development where the treated water pipeline will be laid. At these locations, the pipeline will be laid within the road sub-basement materials ensuring that groundwater flows to wetland sites will not be disrupted. There is a risk of small, likely localised effect of chemical contamination from accidental spills washing into the edges of the wetland sites. The Proposed Development passes through wetland sites Quignashee Cutover and Bunnyconnellan East Cutover Complex. At Quignashee Cutover, the road network passes through the wetland where the treated water pipeline will be laid in the road sub-basement materials ensuring no disruption of groundwater flows. As the Windy Gap BPT will be situated
	Vertigo geyeri habitat – Very High		Negative, Temporary	Small Adverse	Significant	

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
						in the Bonniconlon East Cutover Complex, construction activities which may result in localised drainage of the peat deposits. Pre-mitigation, site activities have the potential to generate runoff contaminated with hydrocarbons are a result of accidental spills and silt laden water which may wash into the wetland resulting in localised effects. The *Vertigo geyeri* habitat is situated to the north of Lough Talt and located adjacent to the R294 where the treated water pipeline will be laid. At this location, the pipeline will be installed within the road sub-basement materials which will mitigate any disruption of groundwater flows within the superficial gravel deposits supporting the habitat. There is a risk of small, likely localised effect of chemical contamination from accidental spills washing into the habitat.
Operation and Maintenance Phase						
Groundwater (Bedrock)	Ballina GWB - Extremely High	Chemical pollution	Negative, Temporary	Negligible	Imperceptible	During the operational phase, there are no earthworks planned which could result in disruption of groundwater flows and erosion causing sedimentation of groundwater. Except where pipeline maintenance is required, ground disturbance will be limited to above ground operational activities At above ground structures, hardstanding will be in place as well as a drainage system to capture accidental spills of fuels and oils. As part of good practice, pollution prevention measures will be implemented to address accidental spills, erosion and sediment transport such as bunded areas, emergency spill procedures. Full details of pollution prevention measures will be outlined in a Construction Environmental Management Plan.
	Bellacorick-Killala GWB – Medium		Negative, Temporary	Negligible	Imperceptible	
	Foxford GWB - Low		Negative, Temporary	Negligible	Imperceptible	
Groundwater (Superficial)	High	Chemical pollution	Negative, Temporary	Negligible	Imperceptible	
Groundwater Abstractions	Extremely High	Chemical pollution	Negative, Temporary	Negligible	Imperceptible	

Receptor	Importance	Potential Effects	Quality and Duration	Magnitude	Significance	Rationale
GWDTEs	Wetland sites - Medium	Chemical pollution	Negative, Temporary	Negligible	Imperceptible	Excavated peat will be reinstated and temporary drains will have been backfilled to restore natural water flows.
	Vertigo geyeri habitat – Very High		Positive, Long-term	Moderate	Profound	Ceasing abstraction at Lough Talt will likely have a long-term beneficial effect by reducing pressures on water levels affecting spring discharges to the habitat of *Vertigo geyeri.*

10.6 Mitigation Measures

10.6.1 Construction Stage Mitigation Measures

10.6.1.1 Ecological Clerk of Works (ECoW)

As discussed in Chapter 7 – Biodiversity, the Appointed Contractor will appoint an ECoW prior to the commencement of construction.

All works carried out within ecologically sensitive areas; at surface water features (lough and watercourses), within woodlands and greenfield sites, will be supervised by a suitably qualified ECoW.

The ECoW shall:

- Be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), the Institute of Environmental Management or equivalent; and
- Have demonstrable experience with overseeing construction in designated conservation sites.

In the detailed CEMP, which the Contractor will be required to prepare and adhere to, the Contractor will provide all necessary method statements to the ECoW to demonstrate how these mitigation measures will be implemented. Such method statements will include the installation and removal of silt control measures (silt curtains, silt fences, silt traps).

The ECoW will be responsible for monitoring the Contractor and identifying to the Contractor any additional or refined mitigation measures (i.e. adaptive management measures required). The ECoW will concisely report the findings of monitoring, including any adaptive management measures recommended to the Contractor, and the effectiveness of same.

The ECoW will have the authority to ensure all mitigation measures are being implemented effectively and will have the authority to stop works activities if required.

The ECoW and Site Manager will deliver site induction and training to all construction personnel prior to commencement of construction activities. The Contractor will maintain a record of training completed, which will be made available to the Developer upon request if required.

The ECoW will monitor Met Éireann's weather forecast and will instruct the Contractor that works within 50 m of watercourses and loughs will not be permitted within 24hrs of Met Éireann issuing a yellow, orange or red weather warning.

The ECoW will monitor all construction works within 50 m (as per criteria above) of the surface water features with potential connectivity to European sites.

The Contractor (following ECoW advice and recommendations) will be responsible for the implementation of mitigation measures. In the unlikely event that the implemented measures are not performing effectively, emergency measures will be put in place e.g. bunding or spill kits and all works will cease immediately. This will ensure that mitigation measures are responsive to unexpected issues that may arise on site during the construction works.

10.6.1.2 Pollution Prevention Measures

The following surface water quality mitigation measures will be at implemented at all open channel watercourses crossed by the pipeline, this includes the Brusna River, the Moy Estuary, 18 EPA identified streams and one field drain near Lough Talt. The locations of these Off Road areas is provided in Table 7-15 in Chapter 7 Biodiversity.

The following surface water mitigation measures will be implemented to avoid potential adverse effects from contaminated runoff from the Proposed Development site.

- No tracking of plant and equipment is permitted across any open channel river or stream or drain containing water flow.
- The Contractor will identify all surface water features near works locations (including watercourses and ditches, which may be affected by the works) and no discharge of silted or contaminated waters to these surface water features is permitted.
- Materials which may cause pollution, including but not limited to; fuels, oils, hydrocarbons, drilling fluids, cementitious materials, will not be stored within 50 m of open channel surface water features.
- Any generators or pumps will be installed on drip trays, with any captured contaminants (hydrocarbons or oils) disposed to a licenced waste facility.
- Any excavated materials will not be stockpiled within 20 m of open channel surface water features.
- Any waste materials, refuse or debris arising from the works site in the vicinity of surface water features will be collected and removed as required so that none may be transported into the surface water features.
- Excavations will not be permitted within 50 m of an open channel watercourse within 24 hrs of Met Éireann issuing a yellow, orange or red weather warning; ECoW to monitor Met Éireann warnings.
- Where works are undertaken within close proximity to identified private groundwater abstractions, including the domestic well located approximately 5–10 m from the proposed RLB and well 1131NWW016 located approximately 45 m from the proposed RLB, enhanced pollution prevention measures shall be implemented, including the prohibition of fuel storage and refuelling activities in the immediate vicinity of the wells and the availability of spill response equipment at all times.

10.6.1.3 Silt Fencing

Silt fences are required between HDD / Pipe Jacking launch and reception pits and open channel water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water feature. Refer to Table 7-15 in Chapter 7 – Biodiversity for locations.

- Silt fences will be installed around the launch and reception pits between, and if possible downgradient of, the potential source of the silt/sediment and any open channel surface water feature.
- The silt fence will contain the area where silted waters are being generated and will terminate on high ground,
- They will be constructed using permeable filter fabric rather than a mesh material,
- The base of the silt fence will be embedded at least 15 cm into the ground and staked at 2 m intervals,
- The vegetated turves will be peeled back and not detached from the ground, the materials inserted, and the turves replaced to hold the base in place,
- The silt fence will be inspected regularly by the ECoW and contractor during the working day and weekly during construction, and in particular following heavy rainfall,
- Silt fences will remain in-situ for the duration of the watercourse crossing works,
- Should water build up behind the fences, the sediment will settle to the bottom. Water can be released, but sediments will remain,
- The fence will not be pulled from the ground, but cut at ground level and the stakes/posts removed,
- Silt fences will be inspected daily and after periods of heavy rainfall.
- A record of its installation, inspection and removal will be maintained by the ECoW.
- Enhanced sediment control measures shall be implemented in the vicinity of identified private groundwater abstractions due to their sensitivity to deterioration in water quality arising from sediment-laden runoff. Temporary silt control measures will be installed, where practicable, to intercept and contain sediment-laden runoff generated during construction works and prevent discharge towards the well and surrounding ground.

10.6.1.4 Dewatering

Excavation works are required at HDD / Pipe Jacking launch and reception pits and groundwater may be encountered during such works. Should groundwater be encountered during excavations the following measures will be implemented:

- Excavations will not be carried out during or following times of prolonged rainfall.
- The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of proposed treatment system, and discharge location.
- All groundwater / perched water removed from the excavation will be pumped to onsite temporary settlement tanks or filtration systems; where a proprietary settlement tank system is used, they are typically located on the stone or ground protection mat platform and water from the excavation will be allowed to settle in these prior to discharge.
- Following discharge of settled waters, any soil sediments remaining in the tanks / filtration systems will be reused where possible for landscaping purposes and / or infill where appropriate, ensuring that any residual soil waste is kept to a minimum. Any soil sediment not deemed suitable for landscaping or infill will be characterised and removed offsite in accordance with all relevant waste management legislation.
- No untreated water discharge will be permitted to any watercourses, field drains or ditches.
- The time period that excavations are left uncovered will be reduced in so far as reasonably practical with impermeable coverings being used to cover excavations over night or in times of heavy rainfall during working hours. These coverings will be secured at night to prevent mammals becoming trapped.
- Where dewatering is required in the vicinity of identified private groundwater abstractions, the wells will be monitored, where access is available, for evidence of groundwater level drawdown, reduced yield, increased turbidity or other deterioration in water quality attributable to the works. Should construction activities result in a temporary disruption to a private water supply, an alternative temporary water supply shall be provided to the affected user until the supply has recovered or appropriate remedial measures have been implemented.
- Prior to construction, the owners of identified private wells located in close proximity to the Proposed Development will be informed of the proposed works and provided with a point of contact for reporting any concerns regarding water quality or supply interruption.

10.6.1.5 Release of Hydrocarbons and Chemicals

In order to prevent any potential surface water effects via. release of hydrocarbon/chemical contaminants the following standard measures will be implemented at all works areas as required:

- Fuels, lubricants and hydraulic fluids for equipment used at the works area, as well as any solvents, oils, and paints will be handled so as to avoid spillage, properly secured against unauthorised access or vandalism, and will be provided with spill containment equipment/systems.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the works area for disposal or re-cycling.
- A response procedure prepared by the Site Manager/ECoW will be put in place to deal with any accidental spill events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained by the contractor and the contaminated soil removed from the works area and properly disposed of in accordance with all relevant waste management legislation.

The following mitigation measures will also be implemented in full for mitigation of construction related contaminants:

- All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.

- The Contractor will ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.
- No oils will be stored in works areas, oils will be stored within site compounds only.
- Generators, pumps and similar plant will be placed on drip-trays to prevent contamination,
- All temporary construction fuel tanks will also be located in a suitably bunded area within the construction compound.
- Particular care will be taken during works in the vicinity of identified private groundwater abstractions, including the domestic well located approximately 5–10 m from the proposed RLB and well 1131NWW016 located approximately 45 m from the Red Line Boundary. No fuels, oils, chemicals or other potentially polluting substances shall be stored within the immediate vicinity of these wells, and refuelling activities shall be undertaken in designated areas away from groundwater receptors.

10.6.1.6 Works at Wherrew Intake Lough Conn

The following mitigation measures are prescribed for the works at the Wherrew RWI&PS and within Lough Conn water body:

General Water Protection

- Establish a clearly defined construction exclusion zone at the lake edge, preventing unnecessary access by personnel, plant or vehicles.
- Carry out all shoreline works in dry, contained conditions using cofferdams or equivalent isolation systems where required.
- Do not allow any construction runoff, concrete washout, fuels, oils, chemicals or fine materials to enter the lake at any stage.
- Maintain all machinery in leak free condition and refuel only at designated, bunded locations remote from the lake.
- Store all materials, including stone, at a safe distance from the lake margin with appropriate containment measures.

Sediment and Turbidity Control

- Use only clean, washed stone free of fines for all rock armour, bedding or reinstatement works associated with pipeline installation.
- Install floating booms and silt curtains around in-lake works to ensure any turbid plumes are contained and allowed to settle.
- Avoid working during periods of high winds or heavy rainfall when sediment dispersal risk is elevated.
- Reinstate disturbed ground immediately so as to avoid silt laden run-off.

Intake Pipeline Installation Measures

- Installation / laying of the new intake pipe within Lough Conn water body is not be permitted during the months when birds are overwintering within Lough Conn and Lough Cullin SPA, namely October to March inclusive.
- Works directly within Lough Conn water body is only to be undertaken during the months of April–September inclusive.
- Lay the pipeline using floating pontoons and controlled lowering to minimise bed disturbance.
- Restrict the footprint of works to the minimum area needed and avoid any dredging or unnecessary disturbance to the lake substrate.

- Install rock armour over the pipeline using controlled placement from pontoon or from shore using long reach equipment, ensuring no plant enters the water.
- Avoid any accidental release of material into the lake by using controlled loading and transfer procedures at the pontoons.

Cofferdam – Sheet Piling (if required)

- Sheet piling may be required as part of temporary cofferdam installation to enable dry working conditions for intake upgrade works.
- Works limited to a short duration (typically 1–2 days) to minimise disturbance.
- Use of resonance-free vibratory piling techniques to reduce underwater noise and vibration.
- Installation of acoustic shrouds and temporary acoustic barriers where required.
- Implementation of restricted working hours to limit disturbance.
- Timing of works between July and September to avoid sensitive periods for fish (spawning, incubation, juvenile development).
- Works scheduled outside the overwintering period for SPA waterbirds to avoid disturbance.

Dewatering and Water Handling

- Electro-fish the coffer-dammed waters, by a suitably qualified and licenced expert, and return any caught fish to the lough prior to any pumping works.
- Pump any water removed from isolated cofferdam working areas back into the lake only after it has been fully settled and is free of visible suspended solids.
- Do not discharge any untreated water to the lake.

Protection of Aquatic Ecology

- Use low velocity intake heads and fine mesh screens on any temporary abstraction or pumping equipment to prevent the entrainment of fish.
- Maintain quiet working methods to reduce disturbance to birds and aquatic fauna using the nearshore zone.
- Avoid works during nighttime, and also early morning and dusk periods where possible to reduce indirect disturbance to foraging species.

Invasive Species Prevention

- Implement full biosecurity measures for all plant, equipment, pontoons and materials used at the water body, including inspection, cleaning and disinfection before mobilising to site.
- Ensure no movement of water, sediment or equipment from Lough Conn to any other water body without full decontamination.
- Use only lake specific pumps, hoses and temporary works equipment to avoid transfer of zebra mussels or other aquatic invasive species.

Emergency Preparedness

- Maintain spill kits at all shoreline working locations and ensure all staff are trained in their use.
- Stop works immediately if any pollutant or sediment release occurs, contain the incident, and implement corrective actions before recommencing.
- Keep a site-specific emergency response plan available and briefed to all site personnel.

Site Reinstatement

- Restore all disturbed shoreline areas to their original profile using clean stone material and natural contours.
- Stone material for shoreline infill should be sourced locally and match the surrounding geology of the lake.
- Reinstate any temporary access routes or working platforms, ensuring all imported materials are removed and ground conditions stabilised.

10.6.1.7 Works at Moy Estuary Crossing

The following mitigation measures will be employed at the west bank and east bank tie in locations to the existing culvert under the Moy Estuary:

- No tracking of plant and equipment is permitted within the estuarine water body nor intertidal areas.
- Silt fences will be installed between the tie in locations and the estuary channel.
- Silt fence mitigation measures will be employed as per off road surface water crossings.
- Materials storage mitigation measures will be employed as per off road surface water crossings.
- Dewatering mitigation measures will be employed as per off road surface water crossings.

10.6.1.8 Crossings at Culverted Surface Water Features

The Contractor will employ the following mitigation measures at on road culverted surface water feature crossings:

- Maintain dry working conditions at culvert entry/exit points using appropriate barriers, pumps or containment as required.
- Install silt fencing/sediment traps at all culvert interfaces to prevent sediment-laden water entering drainage systems.
- Implement strict no discharge protocols for untreated waters to any drain.
- Store all fuels and hazardous materials in double-bunded facilities away from culvert inlets/outfalls.
- Ensure all excavated material is stored at a safe distance from culvert openings to run-off during rainfall.
- Minimise ground disturbance at culvert approaches and reinstate surfaces immediately following pipeline installation.
- Use clean stone only for backfilling around culverts, avoiding loose fines that could wash into watercourses.
- Ensure plant is well maintained, leak-free, and refuelled only at designated controlled locations.
- Maintain emergency spill kits at all culvert locations, with staff trained in their use.
- Undertake regular inspection of culvert protection measures, particularly after heavy rainfall.

10.6.1.9 Pipeline Works Adjacent to Lough Talt

The Contractor will employ the following mitigation measures along the approx. 2 km section of works alongside Lough Talt:

- Do not allow plant, machinery or personnel to enter the lake water body at any time.
- Prevent tracking of machinery on soft ground adjacent to the lake.
- Use only clean, washed stone free of fine material for any trenching works.
- Do not stockpile excavated material or stone within close proximity of the lake edge; store materials on level ground with containment away from surface water pathways.
- Maintain all fuel, oils and chemicals in secure bunded areas away from the lake margin.

- The ECoW will assess the works zones for areas where there is no physical or vegetative barrier to prevent run-off and silt fences will be installed where required.
- Install silt fencing or cut-off drainage on any sloped ground draining toward Lough Talt to intercept suspended material.
- Cover and stabilise any exposed soils immediately following trench backfilling to prevent run-off.
- Avoid works during periods of high rainfall.
- Ensure no discharge of untreated or contaminated waters to Lough Talt.
- The ECoW will implement continuous visual lake water quality monitoring, for sediment or turbidity, during shoreline works to ensure there is no contaminated run-off the lake water body.

10.6.1.10 Windy Gap Break Pressure Tank Mitigation Measures

Peat will be salvaged and reinstated at Windy Gap BPT site to restore upland bog surface conditions. All peat excavated during the works will be carefully salvaged for reinstatement. The tank will be buried / surround by reinstated peat soils, thereby maintaining the surface profile and ecological character of the site as far as practicable. Excess peat will be used to form low bunds around the site, ensuring that all peat resources are retained on site.

The following mitigation measures will be employed at the Windy Gap BPT Site;

The Contractor will strip and store peat separately from mineral soils, keeping intact turves oriented correctly for reinstatement.

- The stripping and salvaging of peat materials will be undertaken under the supervision of the ECoW.
- Salvaged peat will be temporarily stored in the northeast section of the Windy Gap BPT Site where there is no planned infrastructure.
- The Contractor will ensure that the salvaged peat material remains wetted for the duration of construction activities so as to prevent desiccation of peat materials.
- The ECoW will undertake inspections (minimum of two per month) of the salvaged / stored peat materials to ensure that materials are wetted, are not subject to desiccation and remain in good condition for reinstatement.
- Where possible, the Contractor will re-lay salvaged peat over underground infrastructure and around the tank immediately after construction.
- Should the new underground infrastructure or the tank be required to be left exposed for any prolonged period of time, for example for tank testing purposes (typically 1 month), the Contractor will ensure that stored / salvaged peat material remains wetted throughout this period so as to prevent desiccation of peat materials.
- Following the covering of underground infrastructure and tank sides with salvaged peat material, any surplus peat materials will be used to form low bunds that blend with the natural bog surface. The alignment of the bunds will be in line with the Windy Gap BPT Proposed Site Landscaping Plan (Drawing Ref; 10025936-ATK-T1-ZZ-DR-CE-211723).
- The Contractor will avoid deep excavation wherever possible to maintain natural hydrological conditions.
- The Contractor will minimise vehicle tracking on peat and will use light weight plant and bog mats within the site to prevent compaction outside of infrastructure areas.
- The Contractor will encourage natural revegetation by reinstating sphagnum rich peat layers and minimising surface compaction.

10.6.1.11 Wetland Mitigation Measures

The Appointed Contractor will employ the following mitigation measures along the wetland sites adjacent to the pipeline route:

- The ECoW will assess the works zones for areas where there is no physical or vegetative barrier to prevent run-off and silt fences will be installed where required.
- Install continuous silt curtains, silt fencing, straw bales or similar interceptors on road edges adjacent to wetland sites where no natural barrier exists.
- Position all silt/sediment barriers at the lowest feasible point to capture sediment-laden runoff before it reaches wetland soils or channels.
- Avoid any excavation, stockpiling or vehicle turning on land draining directly toward wetland areas.
- Restrict working areas to the minimum footprint required, with machinery movement confined to existing hard surfaces.
- Store excavated material on the opposite side of the road from wetland habitats and ensure it is adequately covered.
- Reinstate roadsides immediately after works, replacing verge vegetation and stabilising soils as soon as possible.
- Avoid works during periods of saturated ground conditions or heavy rainfall when runoff risk is highest.
- Ensure that any trench dewatering effluent is discharged through settlement tanks or vegetated areas, never directly toward wetlands.
- Maintain strict pollution prevention controls (fuel storage, refuelling protocols, spill kits) at all roadside wetland sections.

10.6.2 Operational Phase

The Proposed Development will be operated in accordance with the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention. Furthermore, it should be noted that the proposed design, from concept through to preliminary design, has been developed to ensure that any potential risk of contamination to the receiving land soils and geology environmental, and water (groundwater) environment is negligible. Pollution prevention measures, such as engineered drainage, double bunded tanks, hardstanding and designated waste storage incorporated within the design will mitigate the risk of ground contamination.

With regard to groundwater and surface water quality effects the following mitigation measures are proposed:

- All plant and equipment utilised onsite during maintenance works will be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented.
- Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from Site by the maintenance contractor. While temporarily onsite, all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel / oil tanks temporarily stored on Site will be located in a suitably bunded area and all tanks will be double skinned, with oil / chemical absorbent materials held onsite in close proximity to the tanks. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented.
- Hazardous chemicals will be stored in sealed containers in a store room of the plants workshop building. The exception being sulphuric acid which will be stored in the demineralised water treatment plant in a double walled or bunded Intermediate Bulk Container (IBC).
- In the unlikely event of a fuel / oil or chemical spill / leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as much of the lost product as possible (relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented);
- A maintenance programme for the proposed surface water drainage system should be implemented.

10.6.2.1 Scour Management

Scour management strategy has been developed and is presented in Section 3.9 of Chapter 3 – Project Description. Fittings and markers will be installed in accordance with the appropriate Uisce Éireann standards and specifications. Indicative locations have been included in the drawings and are shown in Figure 10-12, however final number and position will be subject to detailed design undertaken by the Appointed Contractor.

Dewatering and controlled scour discharges of treated water are required as part of construction, commissioning and maintenance activities along the treated water transfer mains as well at Lisglennon WTP, Bonniconlon Reservoir, Windy Gap BPT and Lough Talt WTP.

For all pipelines, scour valves are located at low points along the route. When carrying out emergency works, a section of the pipeline will need to be isolated and emptied in a controlled manner by opening the dedicated scour valve. Maintenance activities such as scouring will be infrequent and undertaken in a manner that avoids release of chlorinated water to the environment. The incorporation of advanced telemetry and automated control will enable continuous monitoring of flows, pressures and water quality, allowing for rapid response to any potential issues and ensuring the system operates within defined parameters at all times. For the key locations the scour proposal is listed in Table 3-15, in Section 3.9 of Chapter 3.

Treated waters required to be discharged will be dechlorinated. All discharge methods are subject to detailed risk assessment and agreement from relevant stakeholders. All anticipated discharge locations will be assessed in advance of any discharge with regard to the sensitivity of the receiving environment and capacity to accept treated water without resulting in negative effects on sensitive receptors, such as protected sites, aquatic species and hydromorphology, as well as impacts on local stakeholders and agricultural land (see Chapter 7 Biodiversity and Chapter 8 – Agronomy).

Agreement will be sought with relevant stakeholders (such as landowners or the local authority) in advance as appropriate. Where it is concluded that dechlorinated/treated water should not be discharged into the environment, water will be collected and tankered to an appropriate disposal location, where allowed.

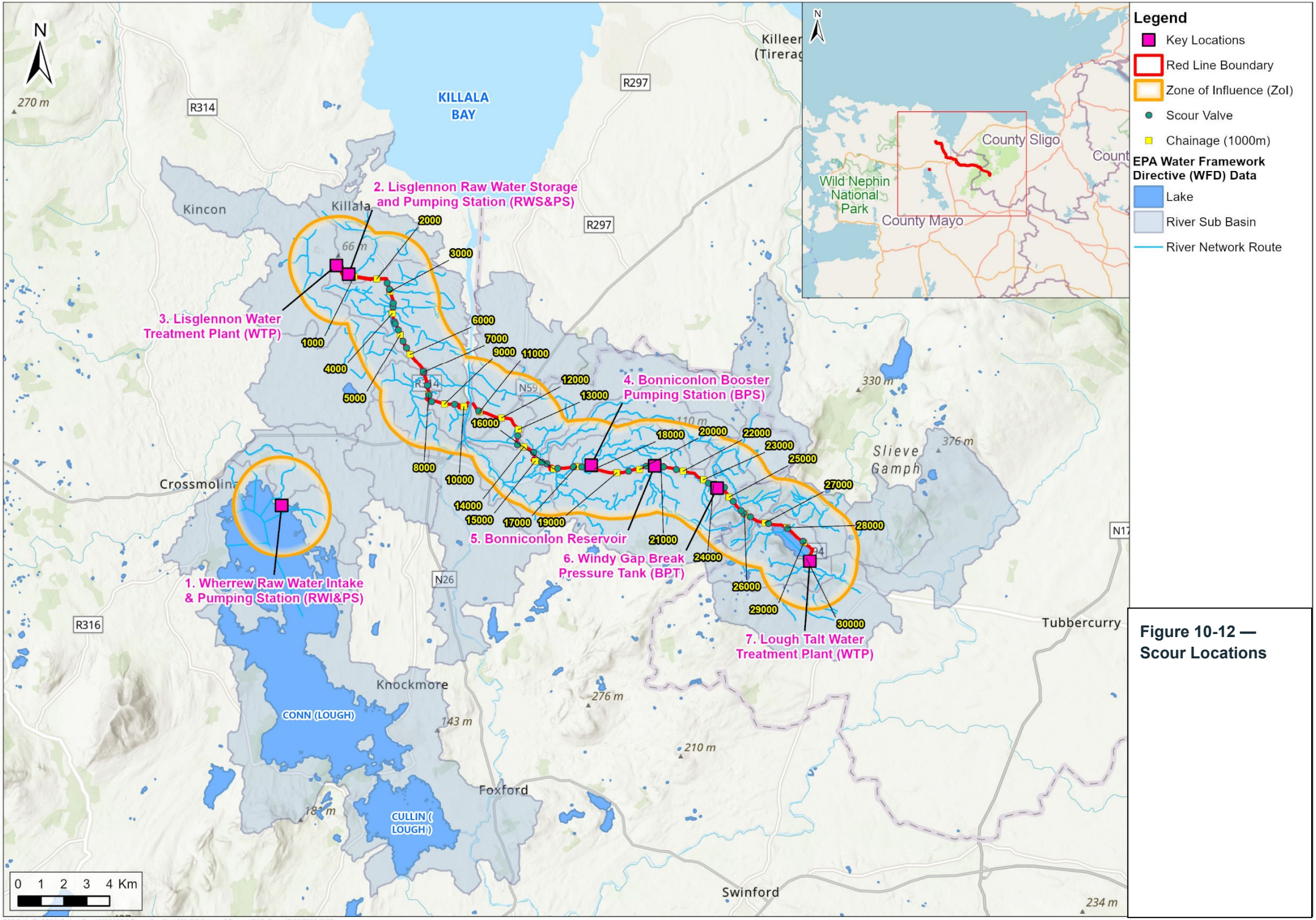


Figure 10-12 — Scour Locations

10.6.2.2 Flood Risk Management

For ongoing flood risk management, all works will continue to apply the relevant, Mayo and Sligo County Development Plan policies, and the Planning System and Flood Risk Management Guidelines throughout detailed design, construction, and operation. Sustainable Drainage Systems (SuDS) and routine maintenance of on-site and local drainage infrastructure will ensure ongoing resilience to extreme rainfall events.

10.6.3 Proposed mitigations and residual effects

The following tables (Table 10-24 and Table 10-25) asses the residual significance of effects on receptors after mitigation. A summary of mitigation is given below.

Table 10-24 — Proposed Mitigation and Residual Effect – Surface Water

Effects Receptor	Pre-mitigation significance	Summary of Proposed Mitigation	Residual Significance
Construction Phase			
Brusna (North Mayo)_020	Significant	Best practice pipeline installation methods, and pollution prevention measures to address accidental spills, mobilisation of sediment and runoff. Crossings at culverted surface water features are addressed below. Silt fences are required between HDD / Pipe Jacking launch and reception pits and open channel water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water features or open excavations. Works carried out within ecologically sensitive areas will be supervised by a suitably qualified ECoW. Additional mitigation measures are included for works at the Moy Estuary crossing in Dooyeaghny_or_Cloonloughan_010 and Rathroeen Stream_010	Imperceptible
Dooyeaghny_or_ Cloonloughan_010	Moderate/Slight		Imperceptible
Moy_120	Significant		Imperceptible
Rathroeen Stream_010	Moderate/Slight		Imperceptible
Behy (North Mayo)_010	Profound	Best practice pipeline installation, and construction methods at Bonniconlon and pollution prevention measures to address accidental spills, mobilisation of sediment and runoff. Crossings at culverted surface water features are addressed below. Silt fences are required between HDD / Pipe Jacking launch and reception pits and open channel water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water features or open excavations. Peat will be salvaged and reinstated at Windy Gap BPT site to restore upland bog surface conditions. All peat excavated during the works will be carefully salvaged for reinstatement. Deep excavation will be avoided wherever possible to maintain natural hydrological conditions.	Imperceptible

Effects Receptor	Pre-mitigation significance	Summary of Proposed Mitigation	Residual Significance
		Vehicle tracking on peat will be minimised, using light weight plant and bog mats within the site to prevent compaction outside of infrastructure areas. The tank will be buried / surround by reinstated peat soils, thereby maintaining the surface profile and ecological character of the site as far as practicable. Excess peat will be used to form low bunds around the site, ensuring that all peat resources are retained on site. Works carried out within ecologically sensitive areas will be supervised by a suitably qualified ECoW.	
Eignagh_010	Significant	Best practice pipeline installation methods and pollution prevention measures to address accidental spills, mobilisation of sediment and runoff. Crossings at culverted surface water features are addressed below. Silt fences are required between HDD / Pipe Jacking launch and reception pits and open channel water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water features or open excavations. Works carried out within ecologically sensitive areas will be supervised by a suitably qualified ECoW. Additional mitigation measures are included for pipeline works adjacent to Lough Talt.	Imperceptible
Glenree_010	Profound		Imperceptible
Glenree_030	Profound	In addition to pipeline installation mitigations, and those addressing culverted surface water features, silt fences are required at the River Brusna crossing between the HDD launch and reception pits and open channel water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water features or open excavations. Non-toxic drilling fluids to be used for HDD. More details on silt fencing mitigations are in Section 10.6.1.3.	Imperceptible
Moy_100	Significant	Mitigation measures are detailed above in Section 10.6.1.6 for works at Wherrew Intake, specifically in relation to protection of the water from sedimentation and turbidity, runoff of pollutants from onshore works or spillages, avoidance of machinery entering the water and disturbance of the bed. Measures for the use of cofferdam/sheet piling, dewatering and installation of the intake pipeline are also included.	Imperceptible
Lough Conn	Profound		Imperceptible

Effects Receptor	Pre-mitigation significance	Summary of Proposed Mitigation	Residual Significance
Moyne_010	Profound	Best practice pipeline installation methods and pollution prevention measures to address accidental spills, mobilisation of sediment and runoff. No works are due to be carried out within ecologically sensitive areas.	Imperceptible
Operation and Maintenance Phase			
Brusna_020 Eignagh_010 Glenree_010 Moy_100 Moy_120 Moyne_010 Lough Conn	Significant	Scour management is discussed in detail in Section 10.6.2.1. All discharge methods are subject to detailed risk assessment and agreement from relevant stakeholders. All anticipated discharge locations will be assessed in advance of any discharge with regard to the sensitivity of the receiving environment and capacity to accept treated water without resulting in negative effects on sensitive receptors, such as protected sites, aquatic species and hydromorphology, as well as impacts on local stakeholders and agricultural land. . Based on current information, no significant environmental or ecological impacts are anticipated. Agreement will be sought with relevant stakeholders (such as landowners or the local authority) in advance as appropriate. Where it is concluded that dechlorinated/treated water should not be discharged into the environment, water will be collected and tankered to an appropriate disposal location, where allowed.	Imperceptible
Cloonaghmore_050 Rathroeen Stream_010	Moderate/ Slight		Imperceptible
Behy (North Mayo)_010	Slight		Imperceptible
Lough Conn	Significant	Maintenance of the intake will avoid working during periods of high winds or heavy rainfall when sediment dispersal risk is elevated, limited to a short duration and localised to the immediate area surrounding the intake. Invasive species prevention protocols will be implemented.	Imperceptible

Table 10-25 – Proposed Mitigation and Residual Effect – Groundwater

Effects Receptor	Pre-mitigation significance	Summary of Proposed Mitigation	Residual Significance
Construction Phase			
Groundwater (Bedrock)	Ballina GWB - Significant	Best practice construction methods and pollution prevention measures to address accidental spills and manage site drainage appropriately. Full pollution prevention measures are listed in Section 10.6. and within the Construction Environment Management Plan. Where groundwater is encountered, the contractor will produce a site-specific dewatering plan.	Imperceptible
	Bellacorick-Killala GWB - Slight		Slight
	Foxford GWB - Imperceptible		Imperceptible
Groundwater (Superficial)	Moderate/Slight	Excavation, management and reinstatement of peat will be carried out in line with best practice. Appropriate management of overburden stockpiles ensuring runoff is managed. Engineering solution to address karst, should it be encountered during excavation. The measures are detailed in Chapter 9: Land, Soils and Geology.	Imperceptible
Groundwater Abstractions	Profound	In addition to mitigation measures identified to protect groundwater, where dewatering is required in the vicinity of identified private groundwater abstractions, the wells will be monitored, where access is available, for evidence of groundwater level drawdown, reduced yield, increased turbidity or other deterioration in water quality attributable to the works. Should construction activities result in a temporary disruption to a private water supply, an alternative temporary water supply shall be provided to the affected user until the supply has recovered or appropriate remedial measures have been implemented.	Imperceptible
GWDTEs	Wetland sites - Slight	In addition to good practice measures to control accidental spills and sedimentation, prior to commencement of work, GWDTEs and drainage pathways will be identified. Where possible, a minimum distance of 20 m between works will be maintained. Works carried out within ecologically sensitive areas will be supervised by a suitably qualified ECoW.	Slight
	Vertigo geyeri habitat - Significant		Imperceptible

Effects Receptor	Pre-mitigation significance	Summary of Proposed Mitigation	Residual Significance
		Excavation, management and reinstatement of peat will be carried out in line with best practice. The Windy Gap BPT structure will be designed to avoid requiring any additional external protection measures, such as external tanking, to enhance durability by avoiding creation of flow paths for groundwater drainage around the structure perimeter. The tank will be structurally designed to resist backfill forces from re-use of existing clay material, rather than conventional granular engineering backfill, since granular material could provide a flow path for groundwater around the structure, leading to uneven drainage.	
Operation and Maintenance Phase			
Groundwater (Bedrock)	Ballina GWB - Imperceptible	None beyond best practice measures to address accidental spillages, runoff and fire suppression wash water.	Imperceptible
	Bellacorick-Killala GWB - Imperceptible		Imperceptible
	Foxford GWB - Imperceptible		Imperceptible
Groundwater (Superficial)	Imperceptible		Imperceptible
Groundwater Abstractions	Imperceptible		Imperceptible
GWDTEs	Imperceptible		Imperceptible
	Profound (positive)		Profound (positive)

10.7 Cumulative and Interactive Effects

A review of all committed / Proposed Developments in the immediate environs of the Proposed Development, approved by Mayo County Council, Sligo County Council or ACP[10] within the last 5 years, has been undertaken as part of the preparation of this EIAR. The majority of these developments have already been constructed or are of small scale in nature (i.e. extension works, or property retention works) or are considered to be a reasonable distance from the Site and so do not warrant further consideration as part of this assessment.

Relevant proposed and existing developments in close proximity to the Proposed Development site which are most likely to result in cumulative effects arising from the construction and operation of the Proposed Development are outlined in Chapter 20 (Cumulative Effects and Interactions). The search of the Mayo County Council, Sligo County Council, ACP planning records, the TII and the Uisce Eireann Planning Portals identified 40 committed developments within the vicinity of the Site; all of which have been assessed as part of this EIAR.

A total of 40 developments were considered as part of the cumulative impact assessment. Of these, 11 developments are located alongside the Proposed Development, but do not spatially overlap with it. These developments are not anticipated to occur concurrently with the Proposed Development. In the absence of spatial and temporal overlap, and given the lack of shared effect pathways, no likely significant cumulative effects are predicted.

Of the considered developments, two notable developments - namely an *Aerobic Digestion (AD) biogas facility and associated infrastructure* (planning permission **313975**) and a *Hydrogen Plant and Energy Centre* (planning permission **2360266**) - were examined in further detail. The assessments undertaken for these developments concluded that they would result in no significant effects on the water environment.

Additionally, the Ballina and Crossmolina Flood Relief Schemes (FRSs) were considered. The Ballina FRS is designed for 1% of the Annual Exceedance Probability (AEP) for fluvial areas and 0.5% AEP for coastal flood events, while the Crossmolina is designed for 1% AEP. NIS and EIA reports have been prepared for both schemes with mitigation measures built in to protect the local hydrology. The Ballina FRS overlaps spatially with the Red Line Boundary for the Proposed Development; however it is noted in the Scheme's application that coordination would ensure that the development works of each scheme would be offset. Cumulative effects from the FRSs would be not significant and related only to short-term flood events.

On this basis, it is concluded that no cumulative effects arise from the considered developments in combination with the Proposed Development.

[10] An Coimisiún Pleanála

10.8 Residual Effects

Taking account of the proposed mitigation measures proposed in this chapter, effects of the Proposed Development will be temporary and not significant during the construction phase, and also during the operational phase. There will be no likely significant residual effects associated with the Proposed Development.

10.9 Monitoring Requirements

In the preparation of this chapter the following monitoring requirements were identified:

- Pre-construction surveys will be carried out in advance of works where appropriate, including site establishment for temporary compounds, construction areas and pipeline route. This will include water quality monitoring, including levels. These surveys will be set out in the CEMP.
- Wherrew intake: monitoring to determine the condition of the intake screen for maintenance purposes as well as routine monitoring of abstraction rates.
- Lisglennon RWS&PS: The rising main and associated chambers will be regularly inspected as per existing operational procedures.
- Windy Gap BPT: Monitoring for leaks from the tank.
- The incorporation of advanced telemetry and automated control will enable continuous monitoring of flows, pressures and water quality, allowing for rapid response to any potential issues and ensuring the system operates within defined parameters at all times.

10.10 Conclusion

In this chapter, the effects of the Proposed Development on the water and hydrology of the ZoI were assessed. Despite the large spatial scale of the Proposed Development, and the number of water bodies – surface and groundwater and smaller surface water features – implicated in the project activities, the effects of the individual activities are slight overall, and imperceptible and temporary once the mitigations proposed are implemented.

10.11 Difficulties encountered during preparation of this chapter

No difficulties were encountered in completing survey work or desktop research to inform this assessment.

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