AtkinsRéalis

Environmental Impact Assessment Report (EIAR) Volume 2– Chapter 3 – Project Description

Uisce Éireann

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BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE

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Abbreviations

Abbreviation	Meaning
BPS	Booster Pumping Station
bgl	Below ground level
BPT	Break Pressure Tank
CEMP	Construction Environmental Management Plan
CRWMP	Construction Resource and Waste Management Plan
CWTMP	Construction Works Traffic Management Plan
ECoW	Ecological Clerk of Works
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
FETAC	Further Education and Training Awards Control
GAC	Granular Activated Carbon
GSI	Geological Survey Ireland
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicles
HMI	Human Machine Interface
IFI	Inland Fisheries Ireland
IR	Infrared Radiation
kVA	Kilovolt-ampere
kW	Kilowatt
LED	Light Emitting Diode
LV	Low Voltage
m^3	Cubic metre
MCC	Motor Control Centre
MEICA	Mechanical, Electrical, Instrumentation, Control and Automation
MV	Medium Voltage
MW	Megawatt
NIS	Natura Impact Statement
NNIA	Non-Native Invasive Species
NPWS	National Parks and Wildlife Service
NQL	National Qualification Level
OD	Ordnance Datum
PLC	Programmable Logic Controller
ProW	Public Rights of Way
PRV	Pressure Reducing Valves
PV	Photovoltaic

Abbreviation	Meaning
RAP	Reclaimed Asphalt Pavement
RGF	Rapid Gravity Filtration
RWI&PS	Raw Water Intake and Pumping Station
RWS&PS	Raw Water Storage and Pumping Station
RWSS	Regional Water Supply Scheme
SCADA	Supervisory Control and Data Acquisition
SID	Strategic Infrastructure Development
SSA	Supervisory Skills Award
TWA	Temporary Working Areas
TWL	Top Water Level
UE	Uisce Éireann
UV	Ultraviolet
UWWEST	Used Wash water Equalisation Settlement Tank
WTP	Water Treatment Plant

Glossary

Term	Meaning
Acoustic hoods	Sound reducing covers fitted over loud machinery/equipment
Arboricultural	Relating to trees and their management
Attenuation	Temporary storage of excess water
Auger boring	Method of trenchless construction where a spinning auger removes earth while a pipe is pushed through
Ballasted	Weighted to improve stability or stop movement
Barge	A flat-bottomed boat for transport of plant and material
Bauer connection	A quick release coupling used in construction to rapidly connect hoses
Berms	Raised banks of earth
Blacktop	Referring to asphalt surfacing on roads or access tracks
Break pressure tank	A tank used to reduce excess pressure in pipelines
Bulk earthworks	Large-scale excavation, ground shaping or filling
Bunding	A protective barrier built to contain spills or leaks
Cardinal markers	Fixed reference points to define direction or location on-site
Cementitious	Containing properties similar to cement
Coarse and Fine screens	Filters that remove material from the water before entering a pump or treatment system
Cofferdam	An enclosure built within or across a body of water to allow the enclosed area to be pumped dry
Culverting	Installing a pipe or tunnel under an obstruction such as roads or railways

Term	Meaning
Duty standby arrangement	A system with one active unit and one backup ready to take over if needed
Electrical ducting	pipes or channels that protect and route electrical cables
Fascine mattressing	Bundles of brushwood placed to stabilise riverbanks or prevent erosion
Filtrate return system	System that returns filtered water to the appropriate stage for reprocessing
Flocculation	mixing that forms clumps or flocs from particles
Flowmeter	Device used to measure the rate of flow in a pipe or channel
Fluoridation	Addition of fluoride to treated water
Foul drainage infrastructure	Network which carries wastewater
Geotechnical	Study of rock or soil for engineering
Geotextile	Fabric used for separation, filtration or protection
Granular activated carbon filtration	Process of using activated carbon to remove contaminants in water
Granular bedding	Layers of small aggregate used to support and protect buried pipes
Hard standing areas	Paved surfaces able to support machinery or equipment
Headland	Narrow piece of land that sticks out into the sea
HMI panel	Human-Machine interface device that allows operators to control, monitor, and interact with machinery
Hydraulic	Relating to moving water
Inert material	Material that is not affected by chemicals or significantly decompose such as stone or sand
Intake channel	Man-made channel that directs water from a source into a system
Intake pump	Pump that draws water from a source into a treatment or distribution system
Isolation valves	Valves used to stop water flow for repairs/maintenance
Launch pit	The area where trenchless construction enters the ground
Local authority	The public body responsible for planning decisions in a specific area
Louvre	Set of angled slats or blades used to protect against debris, direct sunlight or rain, while allowing for airflow and light to access
Lux levels	Measurement of light intensity on a surface
Low voltage (LV) transformers	Low-Voltage transformers that reduce voltage to a safe level for equipment or customer
Modular pontoon	A pontoon made from a number of interconnected sections
Medium voltage (MV) transformers	Medium-voltage transformers that alter electrical voltage up or down in the range used in distribution networks
Open-cut techniques	The process of excavating from the surface to allow for installation of infrastructure
Penstocks	Gate used to control the flow of water in pipelines

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Term	Meaning
Petrol interceptors	Devices used to separate oil from water
Picket fence thickener	Sludge thickening unit using slow moving rakes to encourage flocculation and concentrate solids
Plate press	Machine that dewaters sludge using pressure between plates
Polymer dosing	Addition of polymer to aid in the removal of particles during treatment
Pontoons	Floating platforms used for moving equipment or personnel across waterways
Pressure transducers	Sensors that convert mechanical pressure into an electrical signal for monitoring or measuring
Process galleries	Tunnels or corridors that allow access to equipment in a facility
Rapid gravity filters	Filtration units that use particles like sand to filter finer particles from the water
Reception pit	Designated containment area, usually a type of pit or reservoir, used to temporarily collect and hold liquids, sludge, or other materials before they are transported, processed, or treated.
Red line boundary	The defined boundary outlining the extent of a project or development
Retaining wall	Wall that holds back water or earth
Slotted drain	A narrow surface drain that collects and channels water
Sludge balancing tanks	Used to store and regulate sludge flow before treatment
Sluice Valves	Isolation valves installed on water mains to regulate water flow for maintenance or emergencies
Soda ash dosing	Process of adding soda ash to regulate pH
Splayed entrance	A widened opening to improve access or flow into a structure
Supernatant	Clear liquid above settled solids
Supernatant balancing tank	Tank that collects and regulates clarified water above settled solids
Surge vessel	Tank that absorbs sudden pressure changes in pipes
Telemetry systems	System that automatically transmit data from remote equipment for monitoring and control
Tie-ins	Connections between new and existing infrastructure
Trenching	Excavating narrow trenches for pipes, cables or drainage
Turbidity monitoring	The measurement of water clarity and cloudiness
Twin rising mains	Two parallel pressurised pipelines used to move pumped water
Washwater equalisation	Process of balancing washwater flow before treatment/processing
Washwater settlement	Process of sediments settling out of washwater

3. Project Description

This chapter describes the Ballina and Lough Talt Water Supply Upgrade (the 'Proposed Development') in terms of its layout, design, and key construction and operational characteristics and forms the basis for the assessments presented in this Environmental Impact Assessment Report (EIAR).

The likely sequence and methodology of construction presented in this EIAR are informed by the current stage of design. Should planning permission be granted, a detailed design will be undertaken by the Appointed Contractor.

This chapter contains the following sections:

- Nature and extent of the Proposed Development;
- Existing and Proposed Infrastructure;
- Construction overview;
- A summary of noise and vibration;
- A summary of renewable energy provisions;
- A summary of excavated materials;
- A summary of biodiversity and sustainability provisions;
- Site lighting;
- Scour management;
- Decommissioning approach; and,
- Programme.

3.1 Nature and Extent of the Proposed Development

The Proposed Development comprises both existing and new infrastructure, as well as above ground and below ground elements. This section describes the spatial extent, key components and operational parameters of the Proposed Development.

The Proposed Development site is located in the townlands of: Wherrew, Lisglennon, Ballinteean, Rathglass East, Derreens, Broadlands, Coonealmore, Rosserk, Coonealcauraun, Rathroeen, Culleens, Laghtadawannagh, Farrannoo, Garrankeel, Quignamanger, Quignalegan, Rathmeel, Quignashee, Ballyholan, Behy More, Corrimbla South, Carrownlabaun, Bonniconlon West, Bonniconlon East, and Drumsheen, Co. Mayo; and Knockasliggaun, Glennawoo, Largan, and Gortersluin, Co. Sligo; and Lough Conn, Co. Mayo, and Lough Talt, Co. Sligo.

The Proposed Development, subject to detailed design, will consist of seven "key locations" and five discrete sections of pipeline, as follows:

- Upgrade to the existing **Wherrew Raw Water Intake & Pumping Station (RWI&PS)**, Wherrew, Ballina, Co. Mayo;
- Upgrade to the existing **Lisglennon Raw Water Storage and Pumping Station** (RWS&PS), Lisglennon, Ballina, Co. Mayo;

- **Proposed Pipeline A** – Lisglennon Raw Water Pumping Station to Lisglennon Water Treatment Plant (WTP);
- Upgrade to the existing **Lisglennon WTP**, Lisglennon, Ballina, Co. Mayo;
- **Proposed Pipeline B** – Lisglennon WTP to Existing River Moy Crossing;
- **Proposed Pipeline C** – Existing River Moy Crossing to Bonniconlon Booster Pumping Station (BPS);
- **Proposed Pipeline D** – Bonniconlon BPS to Windy Gap Break Pressure Tank (BPT);
- **Proposed Pipeline E** – Windy Gap BPT to Lough Talt WTP;
- Proposed **Bonniconlon Booster Pumping Station (BPS)** located at Bonniconlon, Ballina, Co. Mayo;
- Proposed **Windy Gap BPT** located at the Windy Gap, Ballina, Co. Mayo;
- Repurposing the existing Lough Talt WTP, Co. Sligo;
- Proposed Treated Water Reservoir at the existing **Bonniconlon Reservoir** site, Ballina, Co. Mayo; and,
- All permanent and temporary works, including construction compounds, access routes, pipeline corridors, and trenchless crossings.

A schematic overview of the development is shown in Figure 3-1. For ease of reference, raw water and treated water assets have been identified and shown separately. The pipelines have been labelled Pipeline A to Pipeline E, identified between origin and termination points. A graphical overview of the Proposed Development is provided in Figure 3-2.

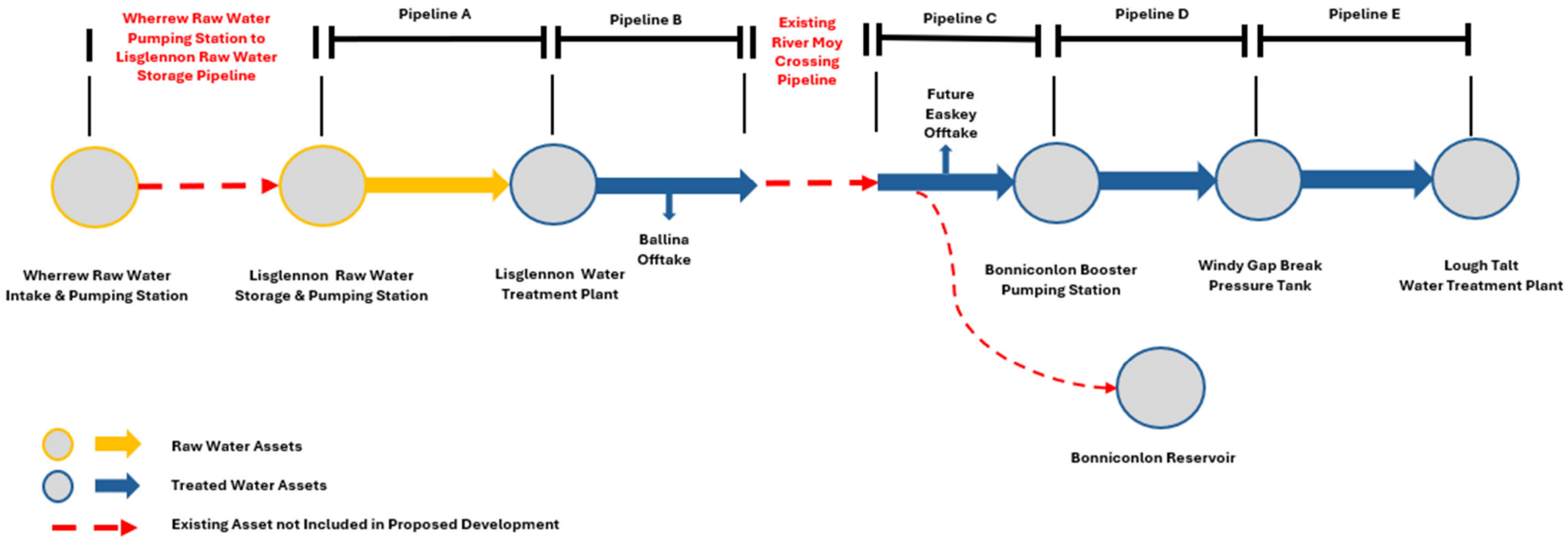


Figure 3-1 — Schematic Overview of the Proposed Development

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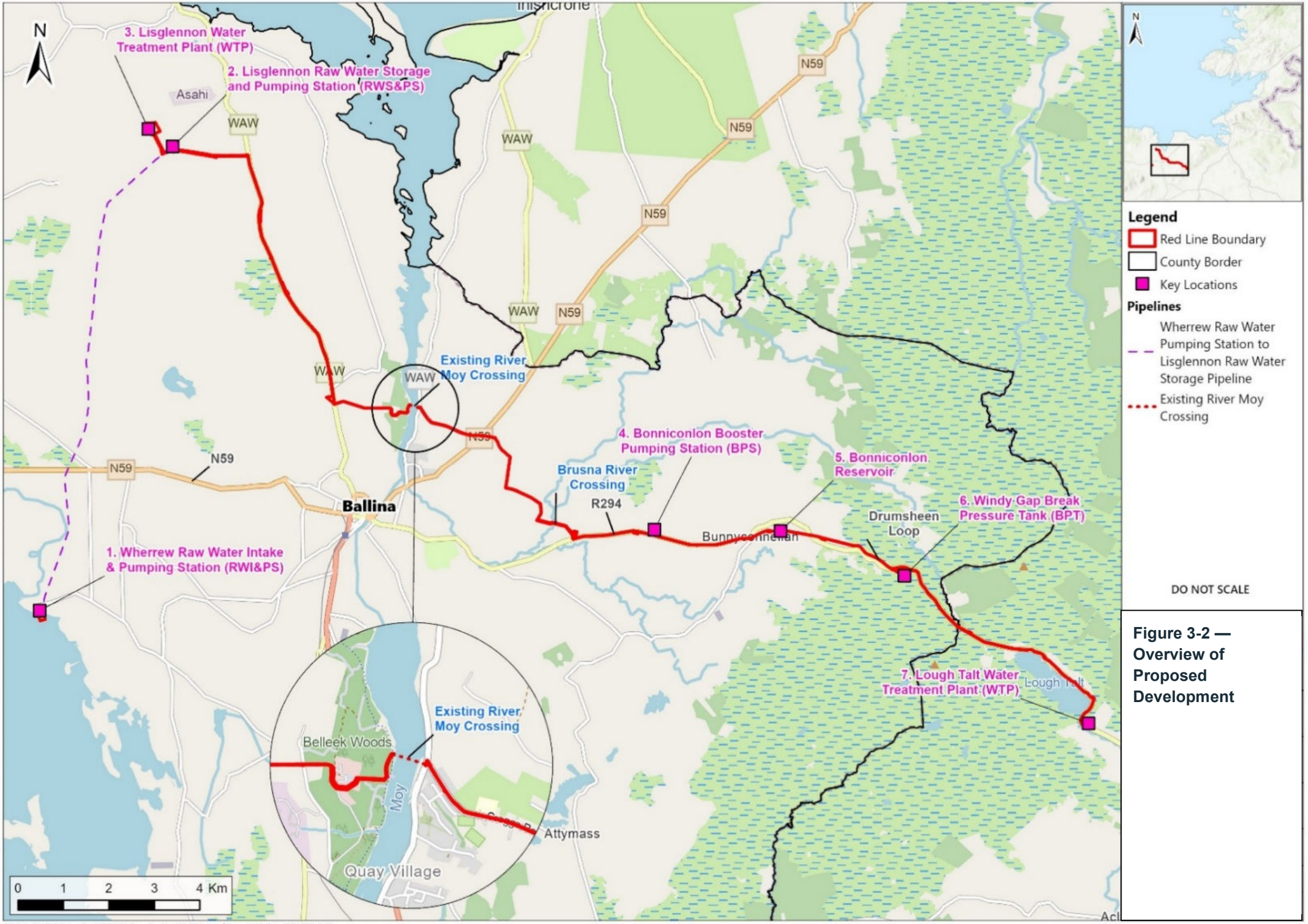


Figure 3-2 — Overview of Proposed Development

3.2 Existing and Proposed Infrastructure

In this section, a summary of the existing infrastructure is provided, then the proposed upgrades or infrastructure is set out.

3.2.1 Wherrew Raw Water Intake and Pumping Station

3.2.1.1 Existing site

The existing site at Wherrew, Cloghans, Ballina, Co. Mayo is located at the top of small bay known as Kent's Pool, on the north-eastern shoreline of Lough Conn (Figure 3-3). The shoreline is comprised of rock/gravel coverage and grass brush land. The site is adjacent to the mouth of the River Deel, which enters Lough Conn to the north around a headland.

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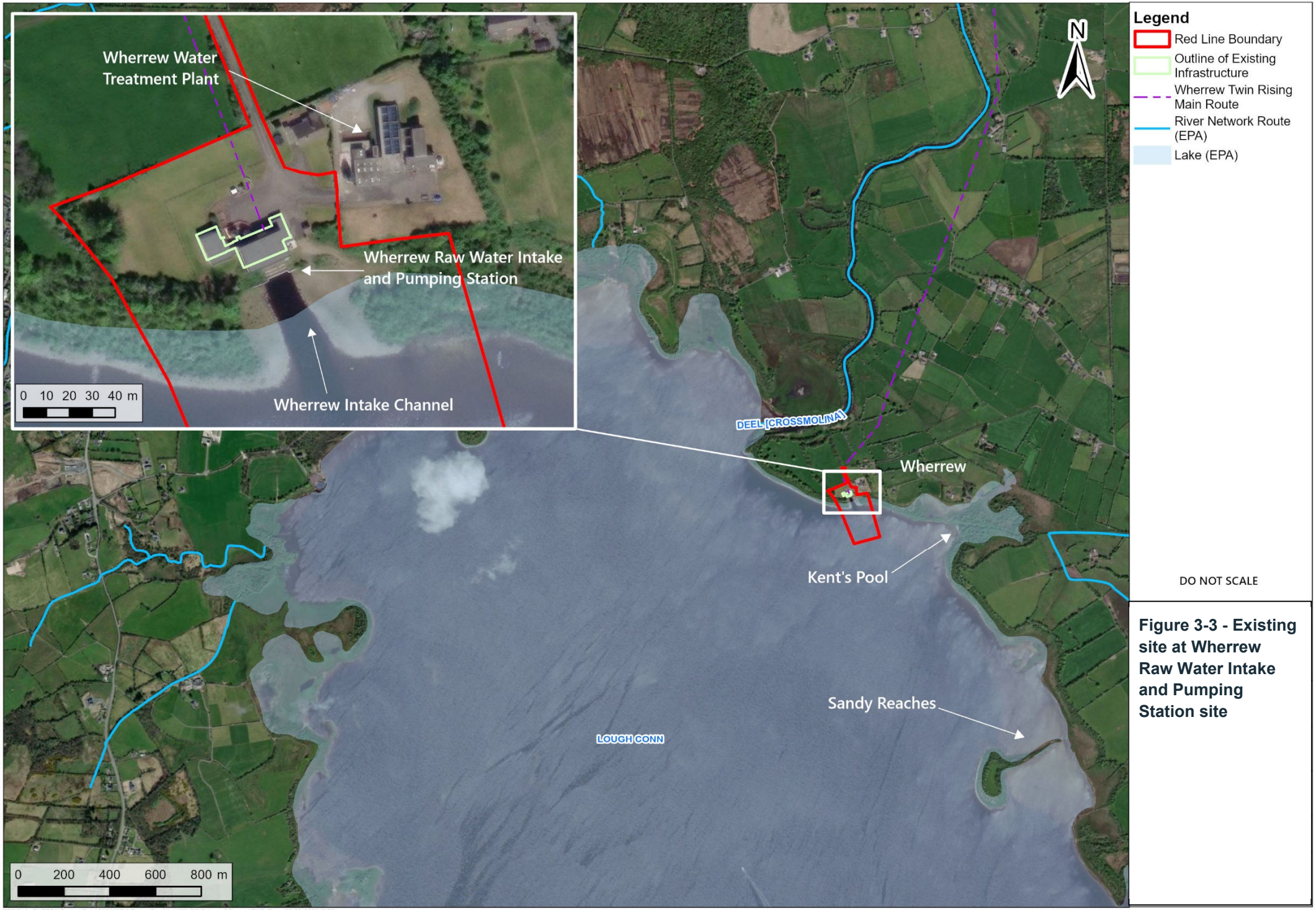


Figure 3-3 - Existing site at Wherrew Raw Water Intake and Pumping Station site

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The existing Wherrew RWI&PS abstracts raw water and transfers to two WTPs, Wherrew WTP and Lisglennon WTP in accordance with the existing abstraction licence (Reference No. R0651-02). The existing development consists of a raw water intake channel, a raw water intake structure, raw water pumping station and transfer pipelines (Figure 3-4, and Figure 3-5).



Figure 3-4 — Wherrew RWI&PS Site Photograph

Key components of the existing Wherrew RWI&PS are shown in Figure 3-5 and are as follows:

- The inlet channel (approx. 50 m long, 20 m wide) was excavated from the original lakeshore, up to the intake structure (ref. no. 3, Figure 3-5). The intake channel bed is formed in natural soils / rock, with natural stone rock armour placed along the banks of the channel. The channel is approx. 2 m deep near the intake structure.
- The intake structure contains two inlet sumps (ref. no. 1, Figure 3-5), with each sump equipped with coarse and fine screens. There are penstocks in each channel to isolate individual channels and sumps for maintenance.
- The raw water pumping station building houses (ref. no. 2, Figure 3-5) designated pumps to supply Lisglennon and Wherrew WTPs independent from one another.
- Existing twin 700 mm rising mains transfer raw water to the inlet chamber at the Lisglennon RWS&PS site (approx. 11 km). A separate pipeline supplies Wherrew WTP independently.
- Welfare facilities for staff (including potable and foul water) are located in the adjacent Wherrew WTP.
- The existing electrical supply at site is 630 kVA. The site is supplied by two medium voltage (MV) transformers and one low voltage (LV) transformer.
- Existing control and telemetry systems consisting of a Motor Control Centre (MCC) and Human Machine Interface (HMI) panel located within the pumping station, enabling control of pump operation.
- There is an existing entrance gate with pedestrian access and car parking to the front of the pumping station building, and access is via the local Wherrew Road (L5111).

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- Existing site drainage consists of road gullies which is connected to the existing local on-site stormwater system.

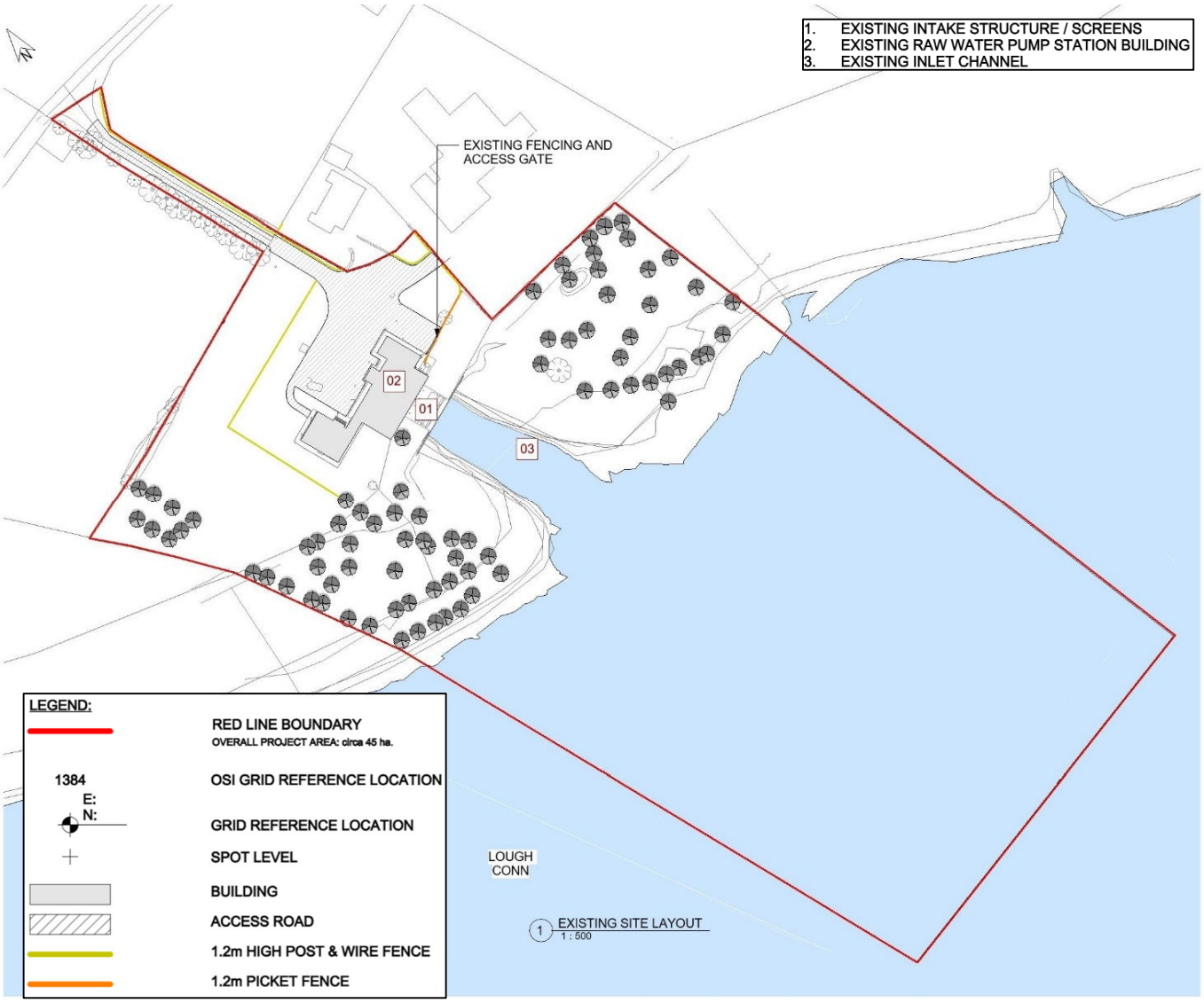


Figure 3-5 — Wherrew RWI&PS Site – Existing Site Layout

3.2.1.2 Summary of Upgrades to Wherrew Raw Water Intake & Pumping Station

The anticipated 2044 future demand is 38,120 m^3/day. The proposed upgrades to the existing Wherrew RWI&PS will facilitate the increased demand and address key operational issues, specifically the accumulation of silt at the intake channel and upgrade fish exclusion systems. A site layout of the proposed upgrades is provided in Figure 3-6.

The proposed upgrades include:

- A new intake pipe (approx. 165 m long, approx. 1,200 mm internal diameter) and intake screen on a precast concrete base (approx. 1.75 m by 1.75 m) (Ref. nos. 3 and 4, Figure 3-6);
- The existing intake channel will be infilled with suitable material to restore the original lakeshore profile;
- Three new cardinal markers;

- Upgrade and extension to the intake structure (Ref. nos. 5 and 9, Figure 3-6);
- Proposed fish return system with acoustic hoods (Ref. no. 11, Figure 3-6);
- Proposed pressure and flow monitoring instrumentation and associated works (Ref. no. 10, Figure 3-6);
- Upgrade of the existing MCC, including provision of an HMI panel and associated Programmable Logic Controller (PLC) modification, located within the pumping station (Ref. no. 2, Figure 3-6);
- Facility to connect a temporary generator, by providing a connection point and change over switch between existing electrical supply and temporary generator, and a concrete slab for temporary generator set down (Ref. no. 8, Figure 3-6); and,
- Ancillary site development works, including access arrangements, engineered landform, hardstanding, security/fencing, surface water (stormwater) management, site lighting, landscaping.
- Temporary works during construction include:
  - A temporary raw water abstraction arrangement; and,
  - A temporary cofferdam or equivalent temporary water-retaining structure to allow the intake structure upgrade works to be undertaken in dry conditions.

The existing 700 mm twin rising mains have sufficient capacity to accommodate the anticipated increases in abstracted water, therefore no works are proposed to these existing rising mains and they do not form part of the Proposed Development.

There are no works proposed to Wherrew WTP or the pumps which supply it, therefore Wherrew WTP does not form part of the Proposed Development.

Further details of the proposed upgrades are provided in the subsections below.

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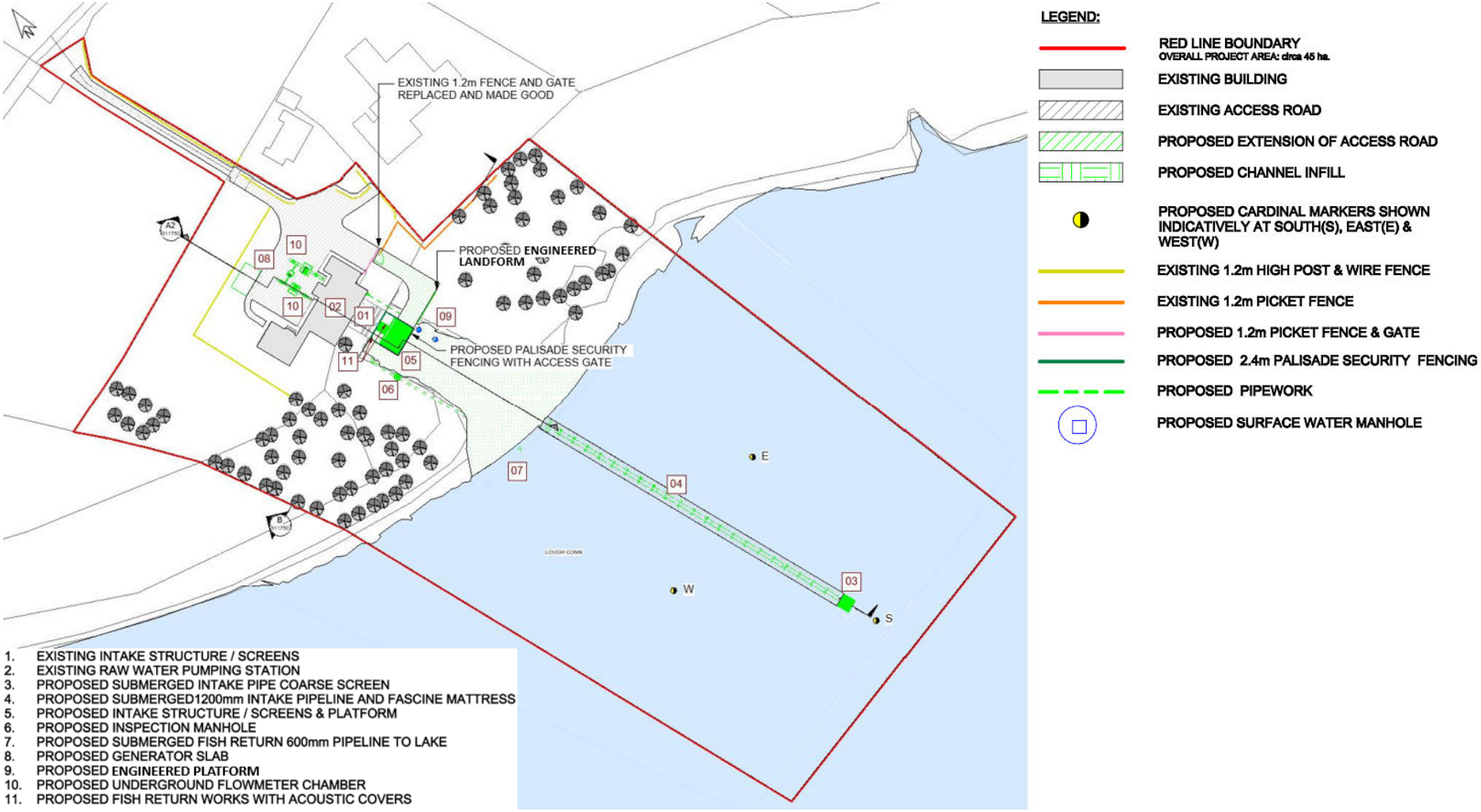


Figure 3-6 — Wherrew RWI&PS Site – Proposed Site Layout

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An indicative visualisation of the proposed upgrades at Wherrew RWI&PS is shown in the Figure 3-7 for illustration purposes.



Figure 3-7 — Wherrew RWI&PS Site Proposed upgrades – Visualisation (for indicative purposes only)

3.2.1.2.1 Proposed Upgrades to Intake: Intake Pipe

A new intake pipe up to 1,200 mm internal diameter is proposed to be installed in Lough Conn (Ref no. 4, Figure 3-6). This intake pipe will extend up to approx. 165 m from the existing intake structure, with approximately 110 m extending beyond the existing intake channel and into the lake, away from the local sediment deposition zone. Within the lake, the intake pipe will be protected by fascine mattressing and rock protection, with an estimated footprint of approximately 880 m^2, and an approx. height of 1.6 m from the lakebed. The end of the intake pipe will be protected by an intake screen with an approximate bar spacing of up to 100 mm (Ref no. 3, Figure 3-6). There are three cardinal markers proposed around the intake pipe as a precautionary measure to mark the location of the intake pipe for small crafts which may use the area.

3.2.1.2.2 Proposed Intake structure and fish return system

The existing intake structure will be extended to accommodate a new inlet chamber, penstocks, fish screens and a fish return system (Ref. nos. 5 and 11, Figure 3-6). The existing intake channel will be infilled with suitable material to restore the original lakeshore profile.

The final design of the fish return system will consider best available advice and technology, however it will include the following basic design principles:

- Two rotating fish screens operating in duty / stand-by arrangement. Operation of the screens will commence in advance of pumping and will continue for a full revolution upon cessation of pumping to ensure no fish remain trapped and the screen is cleaned.;
- An acoustic hood, will be installed over the fish return system to mitigate noise during operation;
- The fish return system will include a return pipeline which will return fish safely to the lake; and,
- Cameras will be provided at Wherrew Intake to enable monitoring of the fish return.

All new and upgraded structures, equipment, and essential electrical/mechanical services within the Flood Zone A/B areas at the site will be designed and constructed to withstand flood conditions (see Appendix 10-2 – Flood Risk Assessment, Volume 3 of the EIAR). Flood resilient design measures incorporated into the design are as follows:

- Intake structure designed to be fully submersible during flood events.
- Structural elements designed to withstand anticipated flood loading.
- Sensitive electrical and control equipment to be located either above design flood levels or outside the floodplain where practicable.
- Access, maintenance and operational procedures to be developed with consideration of flood conditions and residual risk.

3.2.1.2.3 Pressure and Flow Monitoring Instrumentation

To actively monitor the raw water flow, the following works are proposed:

- Installation of pressure monitoring equipment in the raw water pumping station (Ref. no. 2, Figure 3-6); and,
- Installation of flowmeters, located within the Wherrew RWI&PS site, immediately outside of the raw water pumping station building and associated works (Ref. no. 10, Figure 3-6).

Pressure and flow monitoring equipment will be integrated into the control panel located within the raw water pumping station (MCC and HMI). These proposed upgrades will enable active monitoring, potentially improving electricity and water supply efficiency. Associated works include short pipeline sections, isolation valves, flow meter chambers and a scour chamber for flow meter installation.

3.2.1.2.4 Power Supply & Renewable Energy

There is existing power supply to the site, and it is deemed sufficient for continued operation including the proposed upgrades.

Provision for emergency backup supply in the form of a temporary mobile generator is proposed to mitigate the potential disruption to the raw water supply in the event of a power outage at the Wherrew RWI&PS site. It is proposed to include a set down area, a concrete slab (ref. no. 8, Figure 3-6), for a temporary generator connection as a backup power source via mobile generating equipment, located to the west of the site. The temporary mobile generator and associated fuel will be kept off site and will be brought to site when required.

3.2.1.2.5 Ancillary works

Access

Access and egress to site will be through the existing paved access road off the L5111, the main Wherrew access road. Within the site, the existing hardstanding areas will be retained and a new extension of the access road (up to 191 m2) will be constructed adjacent to the upgraded intake structure (Ref. no. 5, Figure 3-6) to enable access for construction and long-term operation and maintenance. The proposed access road will be raised locally using engineered fill to achieve the required road level while minimising encroachment into the adjacent channel area. The lakeward edge of the raised road will be supported by an appropriately designed earthworks and retaining system, or engineered landform, which may comprise a reinforced earth embankment, gabions, a retaining wall, or a combination of these measures. The retained edge of the engineered landofrm will extend for approximately 13.9 m and will have an exposed height of approximately 1.1 m to 1.8 m (Ref. No. 9, Figure 3-6). The final form will be determined during detailed design, having regard to ground conditions, structural stability, hydraulic requirements and landscape integration. As the exposed lakeward face will form a visual continuation of the upgraded intake structure, its materials, colour, texture and finish will be selected to provide a coherent appearance and respond sensitively to the local landscape setting. Where concrete is exposed, it will be finished with nap plaster, or an equivalent finish consistent with that applied to the upgraded

intake structure. A handrail will be installed along the lakeward edge. Road drainage is described in the surface water management section below.

Fencing / Boundary
The existing timber picket type fence and gate on the eastern side of the site will be realigned with continued pedestrian access. A new 2.4 m high palisade security fence with access gates is proposed around the new intake structure (Figure 3-6).

Stormwater Management
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.

Site Lighting
Portable lighting will be provided along the proposed access road and paths to allow for safe access to site. Wall mounted luminaires will be provided above the proposed acoustic hood enclosures. Refer to Section 3.8 for overall site lighting for the Proposed Development.

Landscaping
It is proposed to include soft landscaping measures such as amenity grassland, wildflower and woodland mix planting, and to salvage and reinstate disturbed areas. Additional biodiversity measures include introduction of bat boxes, bird boxes, insect boxes and hibernaculum.

The existing intake is currently located within an inlet channel which was cut into the rock. It is proposed that this channel will be filled, enabling restoration of the original lakeshore. Proposed landscaping will be matched to the existing habitat where possible, i.e. existing willow and alder scrub or woodland. The area above the buried pipes will be grassed rather than treed to maintain the integrity of the buried pipes. The shoreline will be restored as rocky shore aligned with the existing character. Proposed landscaping is shown in Drawing 10025936-ATK-W1-ZZ-DR-CE-211723 (Appendix 3-1 of Volume 3 of the EIAR).

3.2.1.3 Construction

This section describes the likely construction sequence and methodology for the proposed works at Wherrew RWI&PS, based on the current stage of design. All works will be undertaken in accordance with construction provisions set out in Section 3.3, including the environmental controls set out in the construction management plans (Section 3.3.4).

The works will be planned and phased to maintain continuity of raw water abstraction from Lough Conn throughout the construction period, insofar as practicable. Initial activities will include site establishment, set-up of temporary working areas and site compound (see Section 3.3.6), protection of existing operational assets and services, and provision of temporary access to the intake channel and shoreline working area.

To maintain abstraction during the intake upgrade works, a temporary raw water abstraction arrangement will be installed. This is anticipated to comprise of temporary raw water intake pipes, likely polyethylene or similar, connected to the existing inlet sumps. The temporary pipes will generally be laid above ground across the site and extended into Lough Conn, where the intake ends will be supported by pontoons or equivalent floating support systems. The temporary pipework will be weighted, secured and protected, as required, to maintain

stability, prevent accidental damage and ensure safe operation during construction. The temporary intake ends will remain submerged while maintaining clearance above the lakebed. Following completion and commissioning of the permanent intake works, the temporary abstraction pipework, pontoons and associated temporary works will be removed from the lake.

Once the temporary abstraction arrangement is operational, a temporary cofferdam or equivalent temporary water-retaining structure will be installed to allow the intake structure upgrade works to be undertaken in dry conditions. The current anticipated approach is a sheet-piled cofferdam of approx. 30 linear m; however, the Appointed Contractor may adopt an equivalent temporary works solution where this achieves the same function and remains within scope of the environmental assessment in this EIAR. Where sheet piling is used, appropriate noise and vibration mitigation will be implemented, which may include resonance-free vibratory piling techniques, acoustic shrouds, temporary acoustic barriers, restricted working hours and vibration monitoring (see Section 3.3.4). Pile installation is anticipated to be of short duration, subject to ground conditions and the final temporary works design.

Prior to dewatering, the water within the cofferdam will be electrofished by a suitably qualified and licenced expert, and any caught fish will be returned to the lough prior to any pumping works. Water generated during dewatering of the temporary working area will be managed through settlement tanks or other appropriate treatment measures prior to controlled return to Lough Conn. 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. Untreated water will not discharge to the lough. Discharge will only occur following adequate settlement and in accordance with the environmental controls set out in the Appointed Contractor's Construction Environmental Management Plan (CEMP) (see Section 3.3.4). The works to the intake structure will be undertaken in dry conditions behind the temporary cofferdam, (or equivalent) reducing the potential for cementitious materials, hydrocarbons or other construction-related contaminants to enter the lake. Once the intake structure works are complete, the temporary cofferdam or equivalent structure will be removed in a controlled manner.

The fish return system will be installed following substantial completion of the intake structure upgrade works. A fish return pipe will be installed from the intake structure back to Lough Conn. The final alignment and discharge location will be confirmed during detailed design. Installation may require localised shallow excavation or trenching along the lakeshore to accommodate the pipe. Where excavation is required, the trench will be backfilled following installation and the affected area reinstated. Sediment prevention and control measures will be implemented throughout these works.

The new permanent intake pipe will be approximately 165 m in length and up to 1,200 mm internal diameter. The intake pipe length is required to extend beyond the existing intake channel and localised sediment deposition zone, and to reach suitable water depth within Lough Conn, as informed by the hydrological assessment presented in Appendix 10-3 (Volume 3 of the EIAR). Localised preparation of the lakebed will be required along the pipe alignment to provide a stable and level pipe bedding. This is anticipated to involve minor grading and levelling of a narrow strip of lakebed, approximately 1.2 m wide, using plant positioned on a barge, pontoon or similar floating platform.

The intake pipe is anticipated to be assembled onshore and launched or pulled into position using rollers, floatation devices, boats, pontoons or equivalent methods. Once floated into position, the intake pipe will be sunk onto the prepared lakebed and secured. The pipe will be protected using a suitable surround and fascine mattressing, ballasted with clean, washed stone. Stone placement will be undertaken in a controlled manner to minimise disturbance and suspended sediment generation. Along the nearshore section, stone may be placed using a long-reach excavator operating from the shoreline, where practicable. For the remaining in-lake section, stone may be transported and placed from a modular pontoon, barge or similar floating platform.

The intake screen will be installed at the lakeward end of the intake pipe. Localised lakebed preparation will be required to create a stable level formation for the screen unit. The intake screen is anticipated to comprise a

prefabricated unit, including a ductile iron pipe section and coarse screen mounted on a precast concrete base of approximately 1.75 m by 1.75 m. The unit will be lowered into position from a barge, pontoon or similar floating platform and connected to the intake pipe by divers or other suitable specialist methods.

All in-lake works will be carried out using appropriate sediment control and water quality protection measures, which may include silt curtains, silt netting or equivalent controls, where suitable to the working conditions. The detailed measures will be confirmed by the Appointed Contractor and incorporated into their CEMP, taking account of the final construction methodology, weather conditions, lake conditions and ecological constraints. Construction methodology will be agreed with the relevant stakeholders before construction. The anticipated measures to prevent or minimise increases in suspended sediments and protect water quality during construction will be implemented via environmental management plans (see Section 3.3.4).

Following installation of the permanent intake pipe, intake screen and associated infrastructure, the existing intake channel will be backfilled with suitable material and reinstated. Backfilling will be undertaken using suitable clean material, subject to geotechnical and environmental suitability, and the reinstated area will be landscaped to tie in with the adjoining shoreline. The reinstatement works will remove the existing artificial bank incision and restore the shoreline profile, insofar as practicable, to resemble adjoining undisturbed areas.

The in-lake installation works will be weather-dependent and may require extended or continuous working during specific short-duration activities, such as pipe launch, flotation, sinking, placement and connection. Any requirement for works outside normal working hours will be managed in accordance with the procedures set out in the CEMP (Section 3.3.4.1) and relevant agreements with the local authority and other stakeholders. Pre-construction surveys and confirmatory investigations will be undertaken before the in-lake works commence. These may identify localised obstructions, such as rock or other hard material, which may require removal or localised adjustment of the pipe alignment or founding level. Any such works will be undertaken within the assessed development footprint and the assessed environmental impacts set out in this EIAR. Material generated during lakebed preparation will not be removed from Lough Conn unless required by the final construction methodology and agreed through the relevant environmental controls.

Following completion of the intake upgrade works, the remaining ancillary works at Wherrew RWI&PS will be undertaken. These will include installation of the temporary generator set-down slab, electrical ducting and flow meter chambers. The generator slab will be located within the existing car park area and is anticipated to comprise precast concrete units or equivalent. Electrical ducting will be installed between the generator connection point and the pumping station.

Flow meters will be installed downstream of the pumping station on the existing twin 700 mm rising mains within the existing car park area. The flow meters will be housed in chambers with access covers, isolation valves and associated fittings to facilitate safe operation, inspection and maintenance. Excavations will be formed to expose the existing pipelines, with sufficient working space to construct the chambers and install the flow meters. Ducting will be provided between the chambers and the pumping station to connect the flow meters to the pressure monitoring, control and telemetry systems.

On completion of the principal construction works, temporary working areas and temporary abstraction arrangements will be removed, the new access road will be completed using suitable materials, and disturbed areas will be reinstated and landscaped. The proposed works at Wherrew RWI&PS are anticipated to take approximately 6 to 7 months to complete. The works may be undertaken in stages and are not necessarily sequential. The existing Wherrew RWI&PS has sufficient capacity to meet the predicted future abstraction requirements. As such, completion of the Wherrew upgrade works is not required before abstraction from Lough Talt ceases. The construction and commissioning of the Wherrew RWI&PS upgrade works can therefore proceed independently of the other elements of the Proposed Development.

3.2.1.4 Operation and Maintenance

The existing pumps at Wherrew RWI&PS currently operate for approximately 8 hours per day. Following completion of the proposed upgrades, the duration of pumping will increase in response to demand, up to a maximum operating period of approximately 22 hours per day. The pumping station will operate in a duty standby arrangement, with pump operation controlled through the existing control and telemetry systems.

The fish return system will operate in conjunction with the pumping regime. The rotating fish screens will operate in a duty/standby arrangement and will commence operation in advance of pumping, continuing for a short period following cessation of pumping to reduce the potential for fish to remain within the intake system. The system will include automatic screen washing during operation, using low and high-pressure wash systems, and the screens may therefore be cleaned several times per day depending on operational demand and raw water conditions.

Routine operation and maintenance activities will include operator attendance, daily checks and visual inspections, together with scheduled weekly, monthly and annual preventative maintenance tasks. The fish return screens will be inspected during routine operational checks, including when the relevant screen is in standby mode. Inspection and maintenance will be undertaken in accordance with Uisce Éireann operational procedures and the manufacturer's requirements for the installed equipment. An operational flood response plan will be prepared, ensuring that safe access and egress for staff can be maintained during flood events, and that any critical controls are accessible.

The in-lake intake screen will remain submerged during normal operation. As the screen will be located below the water surface and away from the existing intake channel, the potential for routine debris accumulation is expected to be reduced when compared with the existing intake arrangement. 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.

Pressure and flow monitoring instrumentation will be maintained as part of the site's routine operational checks and planned preventative maintenance regime. These systems will support ongoing monitoring of abstraction rates, pump performance and system resilience.

Operational access to the site will continue via the existing Wherrew Road access. No permanent additional welfare facilities or foul drainage infrastructure are proposed at Wherrew RWI&PS as part of the upgrade works.

3.2.2 Lisglennon Raw Water Storage & Pumping Station

3.2.2.1 Existing Lisglennon Raw Water Storage & Pumping Station Site

The existing Lisglennon RWS&PS site at Lisglennon, Ballina, Co. Mayo, is bounded to the northwest and northeast by a wire fence in addition to hedgerow and mature trees. Access to the site is from the L11109.

Raw water enters via the inlet chamber (Figure 3-8A), which functions as a break pressure tank. From there, raw water is transferred to the raw water storage tank (Figure 3-8B), then to the raw water pumping station (Figure 3-8C), as illustrated in Figure 3-9, with an aerial view shown in Figure 3-10. Currently, the raw water storage tank provides approximately 48 hours of storage. The raw water pumping station is equipped with two decommissioned pumps, two operational pumps, one surge vessel, associated pipework and a flowmeter. Raw water leaves the pumping station via an existing 300 mm internal diameter raw water pipeline serving the Lisglennon WTP. There is designated access to the PS, Reservoir and storage area/compound.



Figure 3-8 — Lisglennon RWS&PS Site. A: Existing Inlet Chamber; B: Existing Storage Tank; C: Existing Raw Water Pumping Station, with carparking in front.

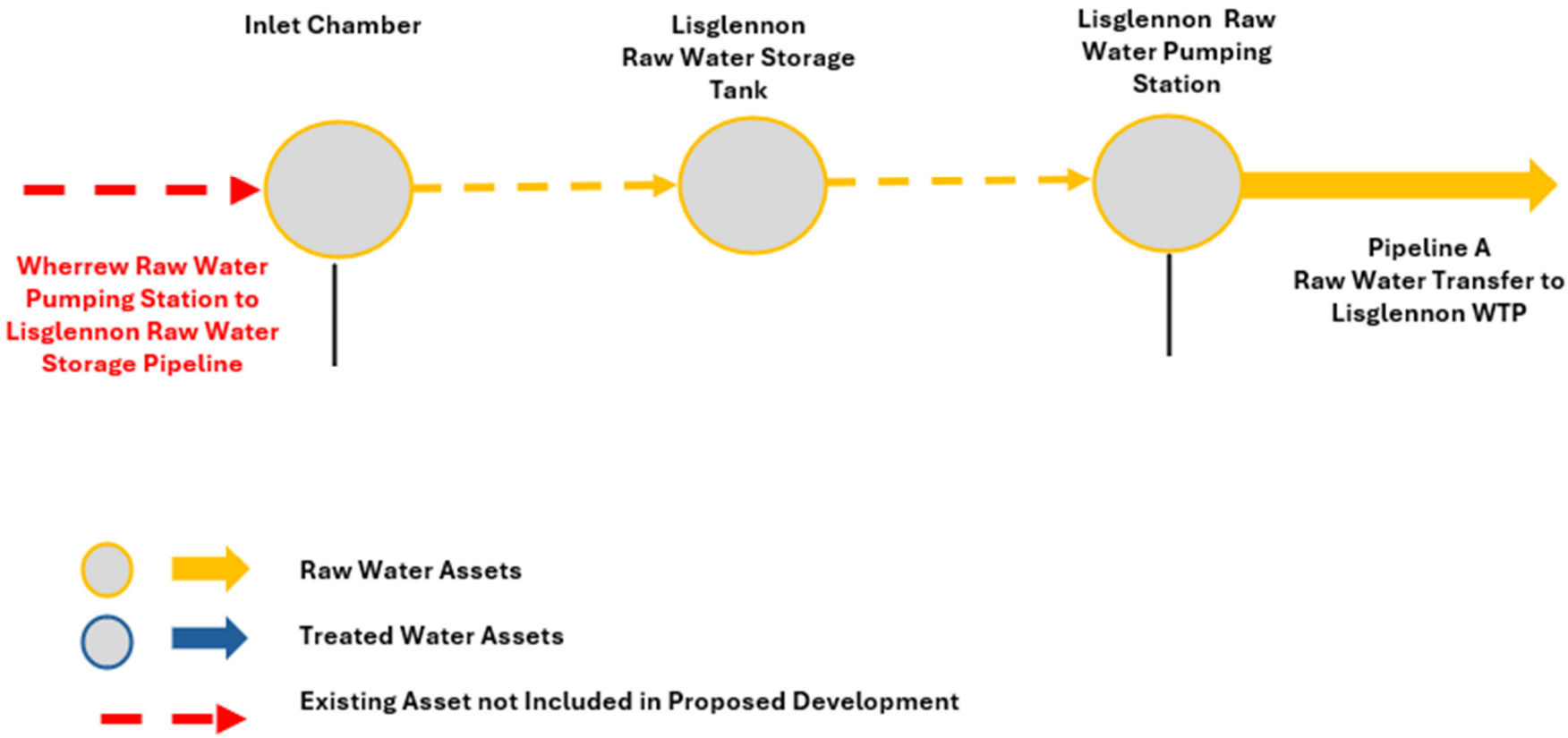


Figure 3-9 — Schematic Overview of Lisglennon RWS&PS Site

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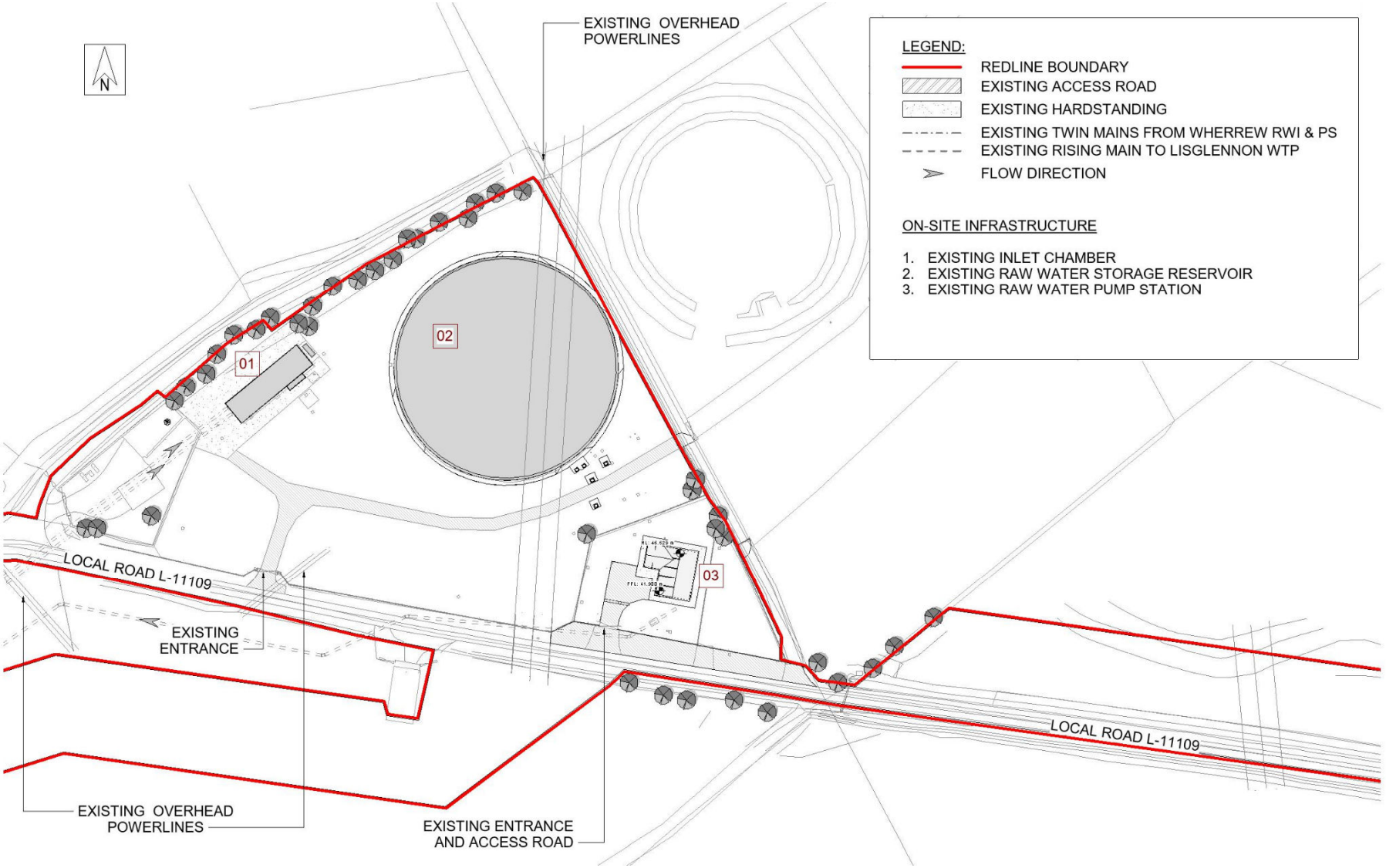


Figure 3-10 — Lisglennon RWS&PS – Existing Site Layout

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3.2.2.2 Proposed Upgrades to the Lisglennon RWS&PS Site

The following upgrades will be undertaken:

- Replacement of the existing, decommissioned pumps with two new pump sets within the pumping station;
- Replacement of the pipework and valves within the pumping station to accommodate increased future flows;
- Installation of pressure measuring instrumentation including pressure gauges and pressure transducers within the pumping station;
- Installation of new flowmeter on Pipeline A (Section 3.2.3); and
- Ancillary works, primarily located within the existing hardstanding area of the pumping station, and landscaping.

No changes are proposed to the power supply, site lighting and stormwater management. A proposed site layout is shown in Figure 3-11.

3.2.2.2.1 Flowmeter installation

Installation of a flowmeter and associated works will be undertaken within the Lisglennon RWS&PS site, immediately outside of the raw water pumping station building. Associated works include short pipeline/ducting sections to connect to the pressure monitoring, control and telemetry systems (located inside the pumping station), isolation valves, flow meter chambers and access covers.

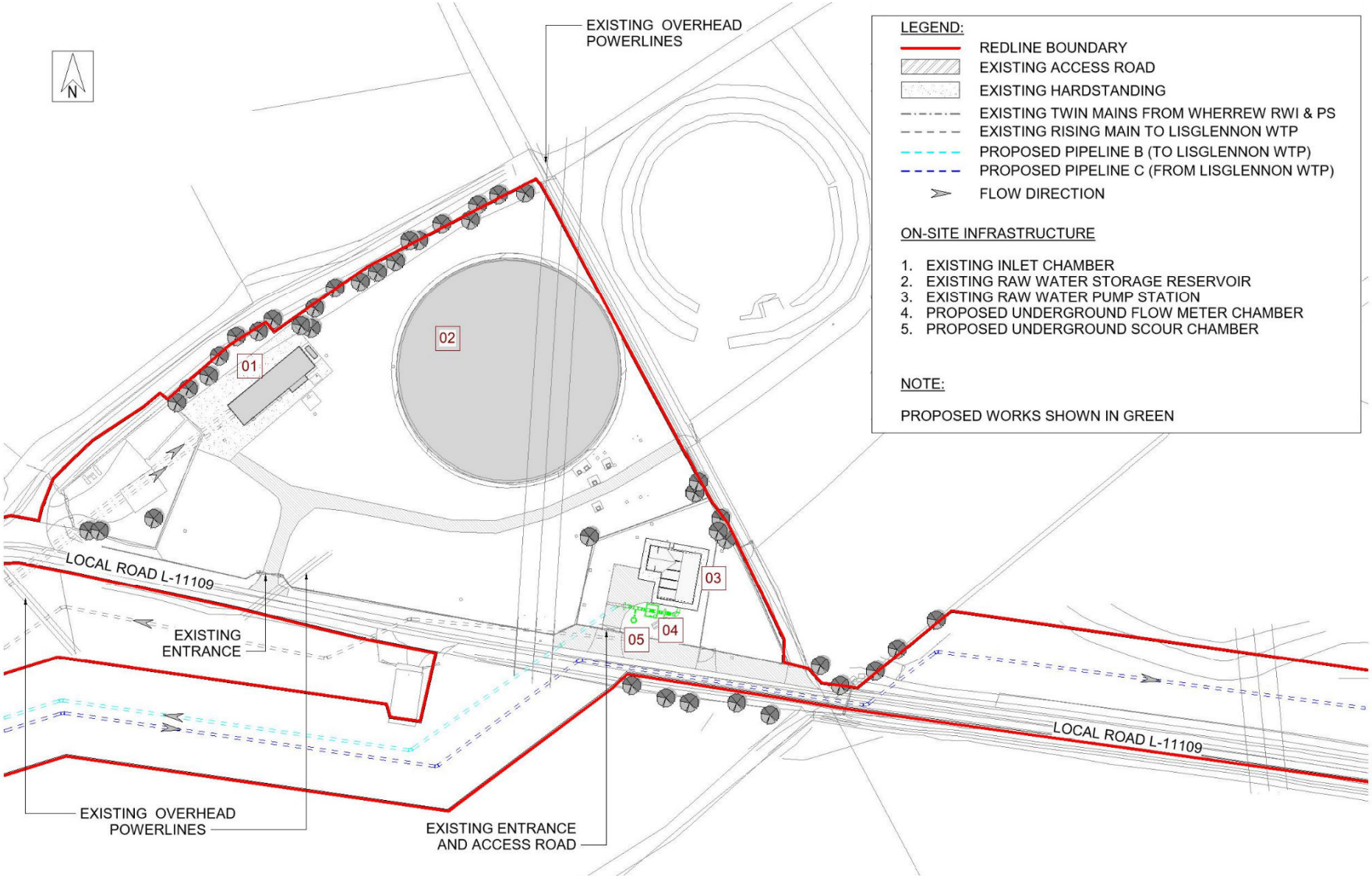


Figure 3-11 — Lisglennon RWS&PS – Proposed Site Layout

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3.2.2.2.2 Ancillary works

Site Lighting

Existing low level pole mounted luminaires will achieve the required lux levels for the access road, pumping station and inlet chamber. No additional site lighting is therefore proposed.

Landscaping

The existing treeline comprising mature ash and beech trees will be retained and unaltered. Areas of amenity grassland around the raw water storage tank will be subject to a reduced mowing regime to encourage the establishment of a wildflower area which will help attract pollinator species. New hedgerow, consisting of native species, will be planted along the southern boundary fenceline. Additional biodiversity enhancement measures include the installation of insect boxes for pollinator species and hibernacula. No bat or bird boxes are proposed due to the potential for contamination of the open raw water storage reservoir. The proposed landscaping layout is shown in Drawing 10025936-ATK-L1-ZZ-DR-CE-211723 (Appendix 3-1 of Volume 3 of the EIAR).

3.2.2.3 Construction

The existing decommissioned pumps together with all associated internal pipework will be replaced and ancillary works such as flowmeter chamber, scour chamber and isolation valve chamber, will be installed within the site. Following the successful installation and testing of the new pumping equipment and rising main, flows will be transferred to the upgraded system. The existing rising main will be retained for use as a bypass during maintenance activities.

3.2.2.4 Operational and Maintenance

The upgraded pumping station will be operated and maintained as a critical component of the raw water supply system, with a focus on reliability, efficiency, and resilience, and will continue to operate for 22-24 hours a day, with a proportional increase in response to demand achieved via additional operational pumps in accordance with the site's current operational hours. It is anticipated that the raw water storage tank will provide approximately 15 hours of storage.

Operation will be controlled through an automated system with appropriate duty/assist/standby pump configurations to respond to varying demand, supported by continuous monitoring of flows, pressures, and pump performance via the new flowmeter and instrumentation. Routine inspections and preventative maintenance will be implemented for all mechanical and electrical components, including pumps, valves, and control systems, with particular attention to wear components and standby equipment to ensure readiness. The rising main and associated chambers will be regularly inspected, including operation of isolation valves and use of scour facilities to ensure no sediment build-up.

3.2.3 Pipeline A – Lisglennon RWS&PS to Lisglennon WTP

3.2.3.1 Existing Lisglennon RWS&PS to Lisglennon WTP Rising Main

The existing 300 mm internal diameter raw water pipeline leaves Lisglennon RWS&PS, crosses the L11109, then continues off-road through private agricultural lands in the Lisglennon area before crossing beneath the L11109 and extending northwards to the Lisglennon WTP inlet chamber. The total length of the existing pipeline corridor is approximately 1 km.

3.2.3.2 Proposed Pipeline A – Lisglennon RWS&PS to Lisglennon WTP

Pipeline A follows the existing raw water pipeline corridor between Lisglennon RWS&PS and Lisglennon WTP, described above.

The following upgrades will be undertaken:

- A new raw water pipeline, approx. 630 mm internal diameter, will be installed parallel to the existing 300 mm raw water pipeline between Lisglennon RWS&PS and Lisglennon WTP building for a total length of approx. 1 km;
- The existing 300 mm diameter pipeline will be retained and connected to Pipeline A through strategically located cross-connections, allowing the pipeline to serve as a maintenance bypass during planned outages or maintenance activities; and,
- Ancillary pipeline infrastructure, including valves, marker posts, fittings and associated chambers, will be installed as required to facilitate the operation, maintenance and identification of Pipeline A.

No watercourse crossings or other connections have been identified as being required along the route of Pipeline A. An aerial view of the location of Pipeline A is provided in Figure 3-12 showing existing and proposed elements. The drawings are provided in Appendix 3-2 of Volume 3 of the EIAR (Drawings 10025936-ATK-L2-ZZ-DR-CE-211101 and -02).

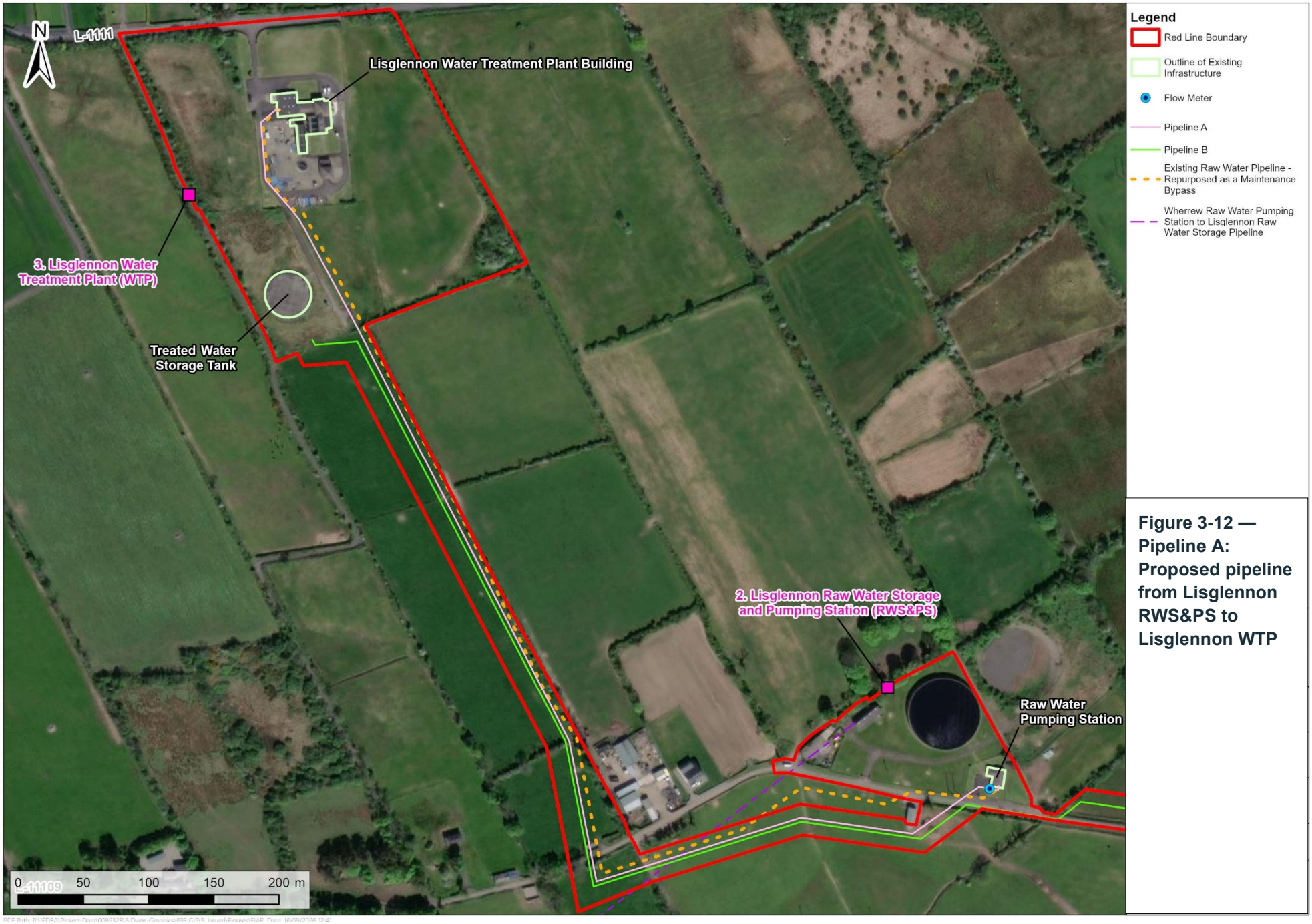


Figure 3-12 — Pipeline A: Proposed pipeline from Lisglennon RWS&PS to Lisglennon WTP

3.2.3.3 Construction

Pipeline A and the initial section of Pipeline B, as described in Section 3.2.5, will be installed in parallel within a common trench between the treated water storage tank at Lisglennon WTP and the site access to Lisglennon RWS&PS on the L11109. The pipelines will be installed using conventional open-cut techniques. Based on current ground investigation information presented in Appendix 9-1, trench depths are anticipated to range from approximately 1.5 m to 3.5 m, subject to detailed design and confirmatory site investigations. A granular bedding layer, anticipated to be approximately 300 mm thick, will be placed at the base of the trench prior to pipe installation. The pipes will then be laid in sections, jointed and surrounded with suitable granular pipe surround material, including material placed between the pipes and above the pipe crowns for protection. The remaining trench will be backfilled using suitable material and reinstated. Within agricultural lands, suitable excavated material will be re-used as backfill above the granular pipe surround where practicable, subject to geotechnical suitability and environmental testing. Where the pipeline is installed within public roads, reinstatement will include suitable engineered backfill, including cement bound granular material where required. A project-level summary of excavated materials is provided in Section 3.6.

Existing field drains, roadside drains or agricultural drainage features that intersect the construction working width will be identified and recorded before works commence. Drainage will be maintained during construction through temporary culverting, diversion, over-pumping or other suitable measures, where required. Any drains affected by the works will be reinstated following pipeline installation to maintain existing drainage function. Where necessary, pre-construction field drainage measures will be installed to maintain existing drainage patterns during construction. No crossings requiring trenchless installation methods are currently anticipated along Pipeline A. A Cultural Heritage feature, CH54, is identified in close proximity to the route. Environmental mitigation and protection measures relating to cultural heritage features will be implemented as set out in the CEMP (Section 3.3.4).

The Appointed Contractor will carry out a detailed site survey in advance of construction to confirm final trench dimensions along the length of the pipeline route, as well as final crossing techniques. For alternative installation methods, please see Section 3.2.5.

3.2.3.4 Operation and Maintenance

Pipeline A will be inspected and maintained as required during operation. Maintenance activities are expected to be limited and will generally relate to routine inspection of valves, chambers, fittings and marker posts, together with any reactive maintenance required to maintain the integrity and performance of the pipeline. The retained existing pipeline will provide operational flexibility and may be used as a bypass during maintenance activities, where required. Project-level scour management is set out in Section 3.9.

3.2.4 Lisglennon Water Treatment Plant

3.2.4.1 Overview of Existing Lisglennon WTP Site

Lisglennon WTP is an existing operational water treatment plant located at Lisglennon, Killala, Co. Mayo. The site comprises a part single-storey and part two-storey treatment building, associated treatment infrastructure, treated water storage, access roads, hardstanding and ancillary operational areas. The WTP is set back from the adjoining L1111 road and is contained within a defined operational site boundary.

The front of the site is bounded by an approximately 1.5 m high stone wall, with fencing along the side boundaries and approximately 2 m high fencing and gates enclosing the rear of the site. Access is provided via an existing splayed entrance from the L1111 road, which connects to internal access roads and operational

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hardstanding areas within the site. A landscaped lawn area is located to the front of the main treatment building, while the treated water storage reservoir is located in the south-western portion of the site.

The site is situated within a predominantly rural and agricultural setting. Agricultural lands adjoin the site to the west, east and south. The wider surrounding area includes rural residential properties, agricultural lands, quarrying activity approximately 800 m to the west, and Killala Business Park, including Tawnaghmore Power Station, to the northwest. The nearest residential receptors are located to the north of the WTP site. Mullafarry Presbyterian Church is also located to the north of the site and is listed on the National Inventory of Architectural Heritage as being of regional significance due to its architectural, artistic, historical and social interest. These surrounding land uses and receptors have been considered, where relevant, in the specialist assessments presented in this EIAR.



Figure 3-13 — Existing Lisglennon WTP – Southeast view from access road



Figure 3-14 — Existing Lisglennon WTP –Water treatment plant

The existing Lisglennon WTP comprises a number of civil, process, mechanical, electrical and ancillary assets that support the treatment, storage and distribution of treated water. The principal existing infrastructure includes the main treatment plant building (Ref. No. 1, Figure 3-15), which accommodates offices, laboratory facilities, welfare areas, chemical dosing rooms and process galleries.

The existing treatment infrastructure includes a coagulation and flocculation tank (Ref. No. 2, Figure 3-15), three clarification tanks (Ref. No. 3, Figure 3-15), three rapid gravity filters (Ref. No. 4, Figure 3-15), a clear water tank (located underground) and a treated water storage reservoir (Ref. No. 7, Figure 3-15). Residuals generated from the treatment process are managed through existing residuals management infrastructure, including a supernatant balancing tank, picket fence thickener (Ref. No. 5, Figure 3-15), sludge sump and plate press located within the sludge dewatering building (Ref. No. 6, Figure 3-15).

Existing chemical storage and dosing systems are provided for disinfection, pH correction and fluoridation (Ref. Nos. 8, 9 and 10, Figure 3-15). The site also includes ancillary infrastructure, including internal access roads, hardstanding, site drainage, utility connections and an existing septic tank serving welfare facilities. The layout of the existing site is shown in Figure 3-15.

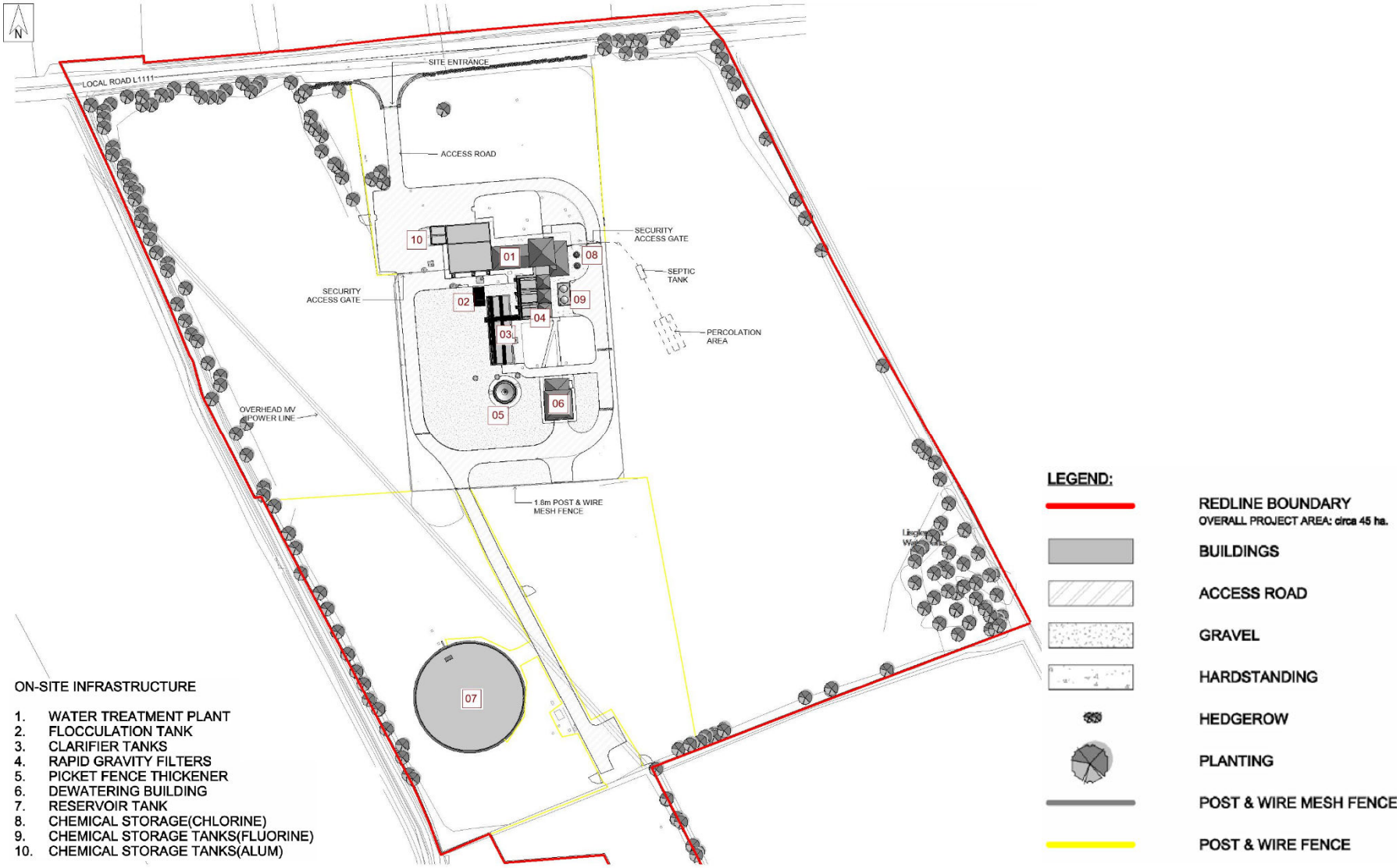


Figure 3-15 — Existing Lisglennon WTP General Arrangement

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3.2.4.1.1 Existing Treatment Process Overview

The existing Lisglennon WTP treats raw water abstracted from Lough Conn and transferred to the site via the Lisglennon raw water system (i.e. infrastructure involved in pumping water from Lough Conn through the Wherrew RWI&PS, raw water mains and Lisglennon RWS&PS).

Raw water enters the WTP via the existing raw water pipeline and is chemically conditioned to promote coagulation with aluminium sulphate. Coagulation is followed by flocculation, where controlled mixing and addition of polymer promotes the formation of larger floc particles in the mixing tank (Ref. No. 2, Figure 3-15).

The flocculated water then passes forward to clarification, where suspended solids and associated floc are settled and removed from the water stream via three clarifiers (Ref. No. 3, Figure 3-15). Each clarifier is equipped with sludge collection systems that transfer settled sludge to a common collection channel.

Clarified water is conveyed to the three existing rapid gravity filters (Ref. No. 4, Figure 3-15), where remaining particulate matter is removed through filtration. Filtered water is then transferred to the treated water system and clear water tank, where disinfection and final water conditioning are undertaken. Primary disinfection is achieved through sodium hypochlorite dosing within the treated water pipeline upstream of the treated water storage reservoir (Ref. No. 7, Figure 3-15). Fluoridation (provided through the dosing of fluorosilicic acid) and pH correction (soda ash dosing) are provided as part of the final treated water conditioning process. Treated water is then conveyed to the on-site treated water storage reservoir (Ref. No. 7, Figure 3-15), which has an approximate capacity of 4,500 m^3 and provides storage and operational balancing for the supply network.

Residuals generated through the treatment process comprise settled solids from the clarification stage and used filter backwash water from the rapid gravity filters. These residual streams are collected and conveyed to the residuals management system for settlement, thickening, storage and dewatering (becoming sludge). Sludge conditioning is undertaken through the dosing of polyelectrolyte prior to treatment within the picket fence thickener (Ref. No. 1, Figure 3-15), where solids are consolidated. Thickened sludge is then conveyed to a sludge storage sump located within the sludge dewatering building. From the storage sump, sludge is transferred to a mechanical dewatering system (plate press) located within the dewatering building. Supernatant arising from the residuals management process is returned to the head of the treatment process, where appropriate.

Dewatered, thickened sludge is stored securely on site prior to removal by a licensed waste contractor. It is transported to an appropriately authorised facility for treatment and recovery, with beneficial re-use prioritised where practicable in line with circular economy principles, regulatory requirements and Uisce Éireann's residuals management approach (see Chapter 14 – Resource and Waste Management for more detail).

Bulk chemical storage for the existing Lisglennon WTP is located externally adjacent to the WTP building, with associated day tanks and dosing equipment provided internally within dedicated chemical dosing areas. Existing chemical dosing systems include aluminium sulphate dosing for coagulation, sodium hypochlorite dosing for primary disinfection, fluorosilicic acid dosing for fluoridation, soda ash dosing for pH correction and polymer for sludge thickening.

The existing treatment process is illustrated in Figure 3-16.

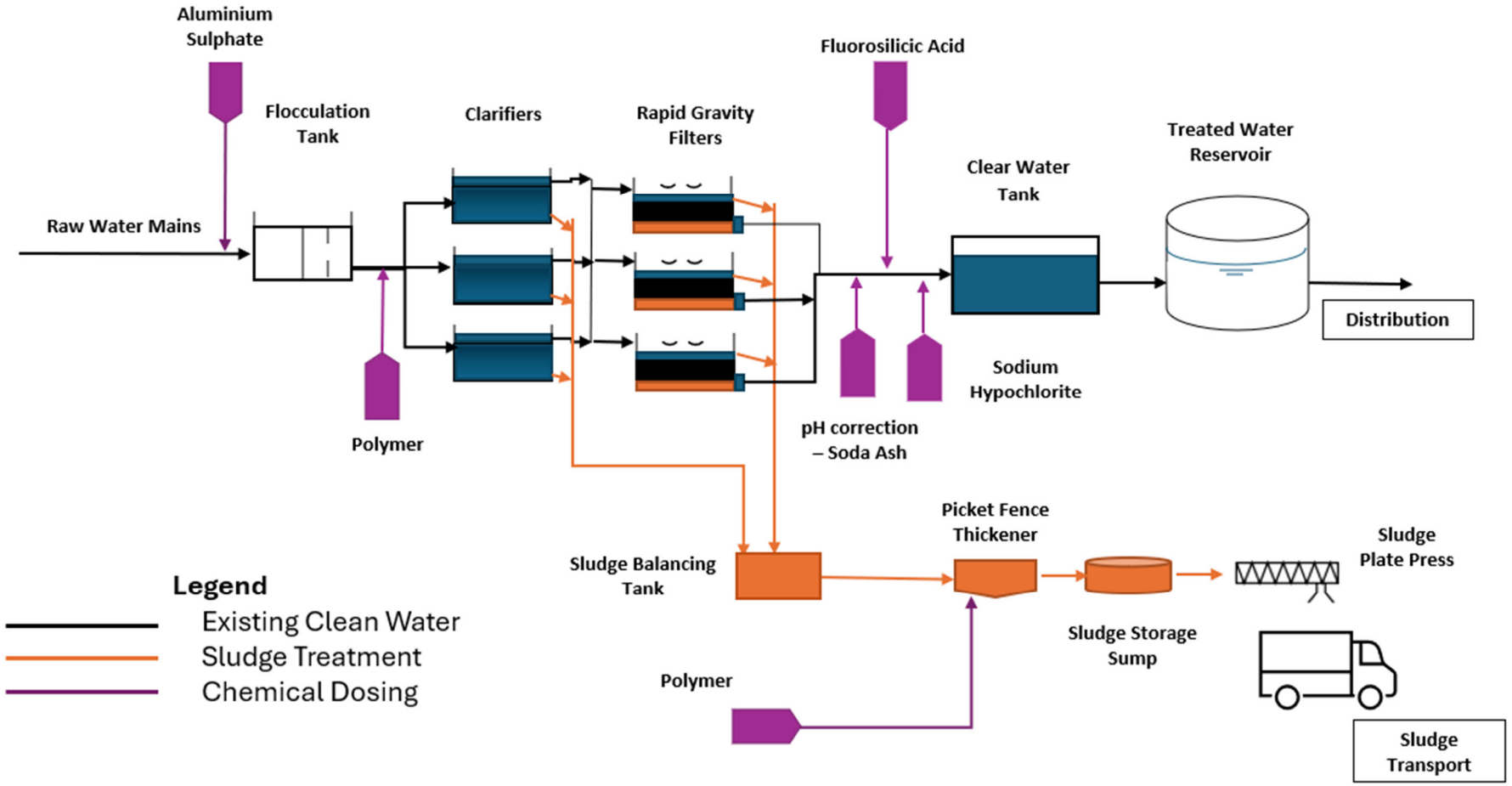


Figure 3-16 — Flow chart of existing water treatment process

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3.2.4.2 Proposed Upgrades to Lisglennon WTP

Lisglennon WTP will be upgraded to provide increased treatment capacity, improved process resilience and enhanced operational control within the existing WTP site. The proposed upgrades will integrate retained existing assets with new treatment, storage, chemical dosing, residuals management, mechanical, electrical, instrumentation, control and automation infrastructure. The upgraded WTP will support the transfer of treated water to the wider Ballina and Lough Talt supply areas and will be operated in accordance with Uisce Éireann requirements for drinking water quality, asset resilience, health and safety, environmental protection and maintainability.

The proposed upgrades have been developed to provide a robust treatment process for the raw water supply from Lough Conn, with additional treatment stages, increased process redundancy, enhanced treated water storage and upgraded residuals handling.

The proposed works at Lisglennon WTP will include:

- Construction of new and upgraded coagulation, flocculation and clarification infrastructure;
- Provision of additional rapid gravity filtration capacity;
- Introduction of granular activated carbon filtration as a secondary filtration stage;
- Construction of a new treated water storage reservoir, to operate in conjunction with the retained existing treated water reservoir;
- Construction of new residuals management infrastructure, including washwater equalisation, washwater settlement, sludge balancing, sludge holding and dewatering facilities;
- Provision of new process buildings, including filter gallery buildings, soda ash dosing building, pump station and UV building, and sludge dewatering building;
- Provision of new electrical infrastructure, including an ESB medium voltage substation, control systems, telemetry and associated ducting;
- Provision of solar PV infrastructure to supplement site power demand;
- Ancillary works, including:
  - upgrades to internal access roads, hardstanding, drainage, fencing, lighting and site security;
  - decommission of the existing septic tank and its replacement with new wastewater treatment system with percolation area; and,
  - landscaping.

Changes to the treatment process includes:

- Provision of new chlorine contact tanks and associated disinfection infrastructure;
- Upgrades to pH correction, alkalinity correction, fluoridation and chemical dosing systems;
- Enhanced coagulation, flocculation and clarification capacity;
- Increasing primary filtration (Rapid Gravity Filtration (RGF)) capacity;
- Introducing second stage filtration through Granular Activated Carbon (GAC) filters;
- Increasing disinfection capacity;
- Increasing pH correction capacity of the final treated water;
- Increasing treated water storage capacity; and,
- Increasing residual management capacity.

The proposed site layout is shown in Figure 3-17. Upgrade of the Lisglennon WTP will include new infrastructure, repurposing of existing infrastructure and ancillary works, as follows:

- Retained and upgraded infrastructure:
  - Existing WTP (Ref. No. 1, Figure 3-17);
  - Upgrades to existing flocculation tank (Ref. No. 2, Figure 3-17);
  - Existing clarifier tanks (Ref. No. 5, Figure 3-17);
  - Existing rapid gravity filters and building (Ref. No. 7, Figure 3-17);
  - Existing reservoir tank (Ref. No. 15, Figure 3-17);
  - Existing dewatering building (Ref. No. 18, Figure 3-17);
  - Existing picket fence thickener (Ref. No. 23, Figure 3-17); and,
  - Existing chemical storage tanks – fluorine (Ref. No. 24, Figure 3-17).
- New structures
  - Proposed flash mixing tank ((Ref. No. 3, Figure 3-17);
  - Proposed new flocculation tank (Ref. No. 4, Figure 3-17);
  - Proposed clarifier tanks (Ref. No. 6, Figure 3-17);
  - Proposed rapid gravity filters and building (Ref. No. 8, Figure 3-17)
  - Proposed clear water tank (Ref. No. 9, Figure 3-17);
  - Proposed pumping station and future UV building (Ref. No. 10, Figure 3-17);
  - Proposed GAC filters and building (Ref. No. 11, Figure 3-17);
  - Proposed soda ash and dosing building (Ref. No. 12, Figure 3-17);
  - Proposed chlorine contact tank (Ref. No. 13, Figure 3-17);
  - Proposed reservoir tank (Ref. No. 14, Figure 3-17);
  - Proposed used washwater equalisation tank (Ref. No. 16, Figure 3-17);
  - Proposed used washwater settlement tank (Ref. No. 17, Figure 3-17);
  - Proposed filtrate and supernatant return pumping stations, inside existing dewatering building (Ref. No. 18, Figure 3-17)
  - Proposed dewatering building (Ref. No. 19, Figure 3-17);
  - Proposed sludge pumping station (Ref. No. 20, Figure 3-17);
  - Proposed sludge balancing tank (Ref. No. 21, Figure 3-17);
  - Proposed sludge holding tank (Ref. No. 22, Figure 3-17);
  - Proposed chemical storage tanks – 1 no. New tank and 2 no. replacements of existing sodium hypochlorite bulk storage (Ref. No. 25, Figure 3-17);
  - Proposed chemical storage tanks – alum (Ref. No. 26, Figure 3-17);
  - Proposed chemical storage tanks – sulphuric acid (in repurposed alum tanks) (Ref. No. 27, Figure 3-17);
  - Proposed drain down pumping station and storage tank (Ref. No. 28, Figure 3-17);
  - Proposed waste water service return pumping station (Ref. No. 29, Figure 3-17);
  - Proposed waste water treatment system and percolation area (Ref. No. 30, Figure 3-17);
  - Proposed ESB MV substation building (Ref. No. 31, Figure 3-17);
  - Temporary generator plinth (Ref. No. 32, Figure 3-17);
  - Temporary mobile dewatering unit setdown area (Ref. No. 33, Figure 3-17);
  - Proposed weigh bridge (Ref. No. 34, Figure 3-17);
  - Decommissioning of the existing septic tank and its replacement with new wastewater treatment system with percolation area;
  - Installation of solar panels; and,

- Ancillary site development works, including upgrades to internal access roads, temporary generator plinth, mobile dewatering unit setdown area, weighbridge, hardstanding, drainage, fencing, lighting, site security and landscaping.

A 3D isometric site layout showing existing and new structures is shown in Figure 3-18.

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Figure 3-17 — Lisglennon WTP – Proposed Site Layout (new and upgraded elements in green)

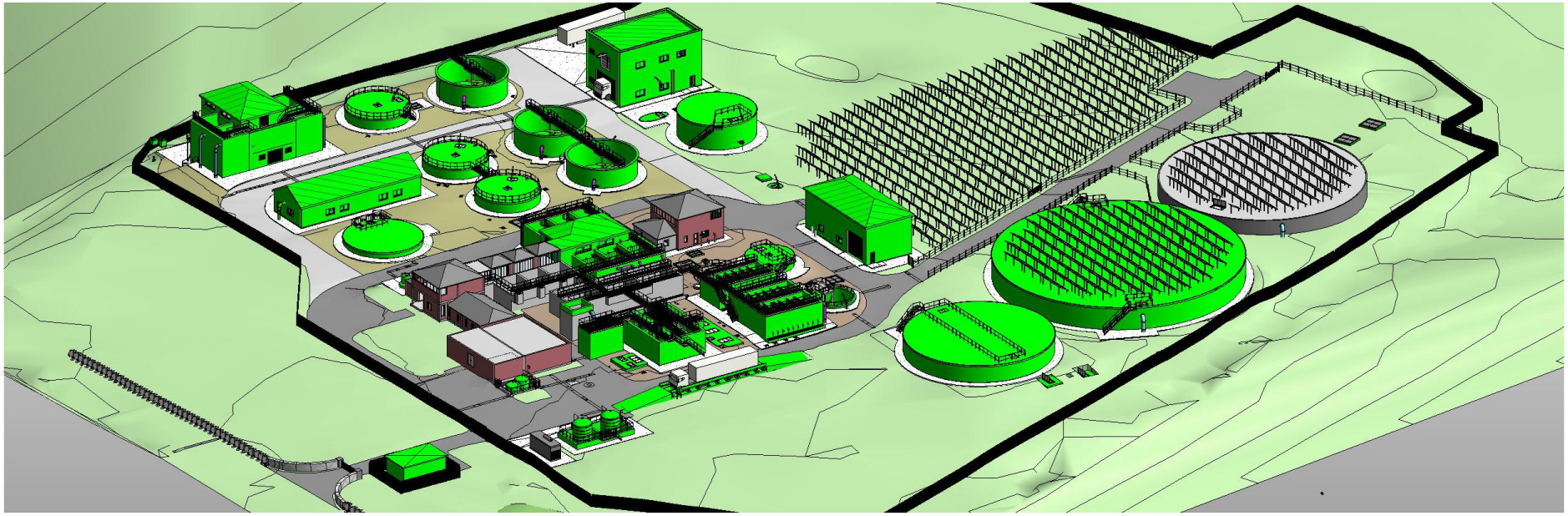


Figure 3-18 — Lisglennon WTP site layout showing existing and new structures

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In terms of buildings, a summary is provided in Table 3-1.

Table 3-1 — Summary of new buildings.

Ref. No.*	Structure	Height / storeys	Approx. Footprint (m^2)
8	New Rapid Gravity Filter	Two storey with entrance on mezzanine	
		Filter Gallery	103
		Viewing Gallery	93
10	New Pumping Station and UV building	Single-storey	180
11	New GAC Filter	Two storey with entrance on mezzanine	
		Filter Gallery	120
		Viewing Gallery	120
12	New Soda Ash Dosing building	Single storey with basement	
		Entrance Level	91
		Lower Level	62
19	New Dewatering building	Two-storey	
		Ground Floor	153
		First Floor	153
31	New ESB MV Substation	Single-storey	35

* Reference numbers correspond to Figure 3-17.

3.2.4.2.1 Proposed Process Summary

Raw water will enter Lisglennon WTP via Pipeline A and will be directed to the upgraded coagulation and flocculation stage. The existing mixing tank will be retained and supplemented by two new flocculation tanks. Chemical dosing, alum sulphate and sulphuric acid to optimise coagulation and pH correction respectively, will be provided downstream of the existing mixing tank.

Polymer dosing will be provided at the new flocculation tanks.

Following flocculation, flow will be conveyed to the clarification stage. The three existing clarifiers will be retained and supplemented by three new clarifiers, providing additional clarification capacity and process resilience. Clarified water will then be conveyed forward to the filtration stage.

The three existing rapid gravity filters will be retained and supplemented by six new rapid gravity filters. The rapid gravity filters will provide primary filtration.

The next step is Granular Activated Carbon (GAC) filtration, providing additional treatment resilience as the new secondary filtration stage. This secondary filtration stage can be bypassed (via the GAC bypass route). Water will then be transferred to a new clear water tank.

Proposed Treated Water System

Following transfer from the clear water tank, primary disinfection and final treated water conditioning will be applied prior to the new chlorine contact tank. This will include sodium hypochlorite dosing for disinfection

(existing, with one additional bulk storage tank and replacement of existing bulk storage tanks), fluoridation (existing system), and pH/alkalinity correction using soda ash. The chlorine contact tank will provide the required disinfection contact time before treated water is conveyed to on-site treated water storage. A new UV building will be constructed for future inclusion of UV disinfection infrastructure to be added to the treatment process.

The existing treated water storage reservoir will be retained and supplemented by a new treated water storage reservoir. The new and retained reservoirs will provide increased treated water storage and operational balancing capacity. Treated water will then leave Lisglennon WTP for distribution through the proposed treated water pipeline system.

A flow diagram setting out the upgraded treatment process is provided in Figure 3-19 and summarised below.

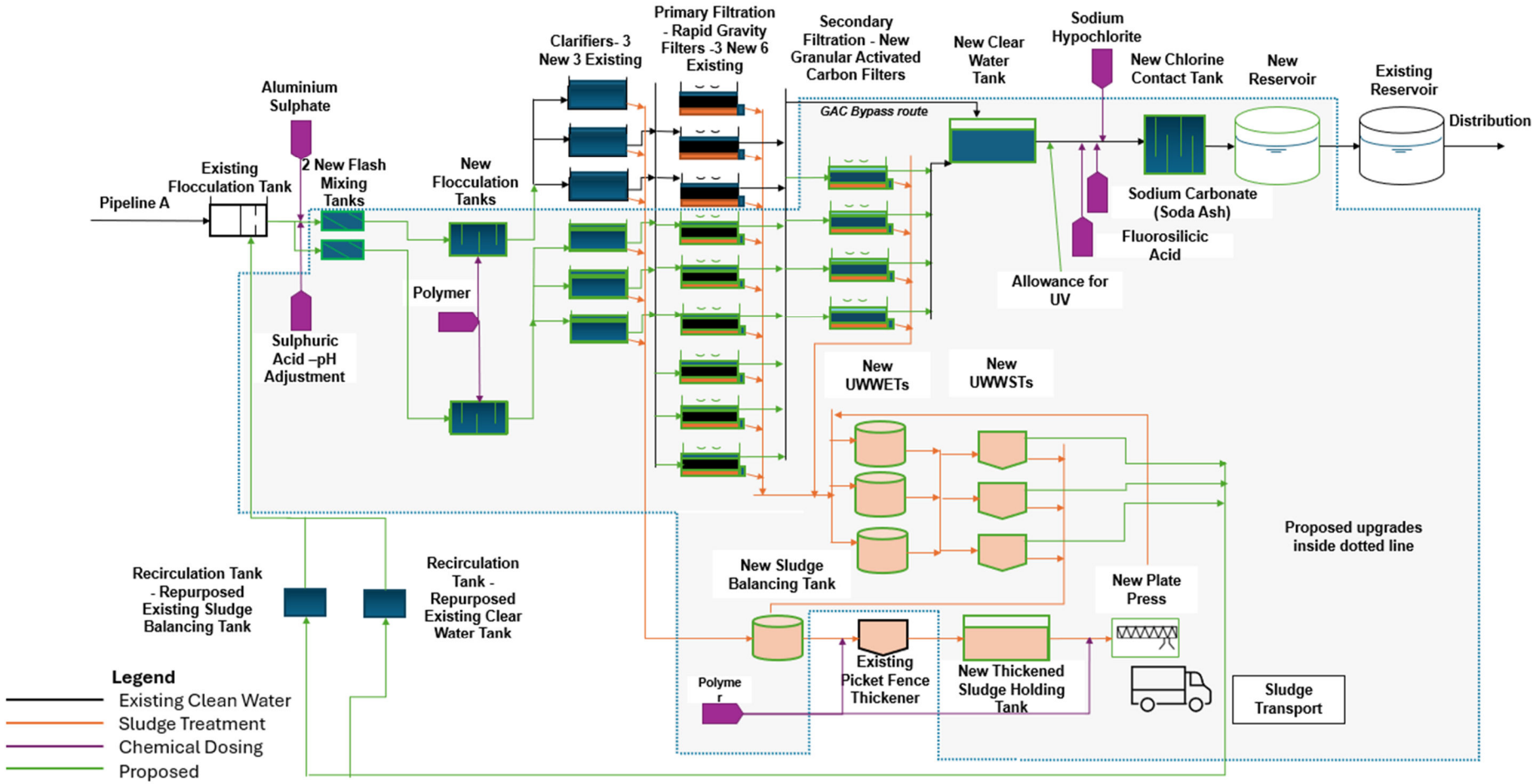


Figure 3-19 — Lisglennon Water Treatment Plant Process Flow Diagram, with all inside the blue dotted line showing the proposed upgrades.

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A summary of new and retained assets is set out in Table 3-2, Table 3-3 and Table 3-4.

Table 3-2 — Summary of proposed and retained Lisglennon WTP Assets

Ref. no.*	Asset	Retained / Proposed	No. Units	Area (m^2)	Unit Volume (m^3)
2	Flocculation tank (upgraded)	Retained	1	6.5	34
3	Flash mixing tank	New	2	6.25	19
4	Flocculation tank cell	New	1	54.63	311
4	Flocculation tank cell	New	1	40.38	230
5	Clarification tank	Retained	3	33.28	146
6	Clarification tank	New	3	53	233
7	Primary Rapid Gravity Filtration tank	Retained	3	17.49	63
8	Primary Rapid Gravity Filtration tank	New	6	21.6	79
9	Clear water Tank (Backwash Tank)	New	1	132.7	400
11	Granular Activated Carbon filter	New	4	15	53
13	Chlorine Contact Tank	New	1	492.5	1,230
14	Treated water Storage Reservoir	New	1	3482.52	6,800
15	Treated Water Storage Reservoir	Retained	1	2438.82	4,500

* Reference numbers correspond to Figure 3-17.

Proposed residuals management system

Residuals generated from the clarification and filtration stages will be managed through the upgraded residuals management system.

Clarifier residuals will be conveyed to a new sludge balancing tank.

Used filter washwater from the rapid gravity filters and Granular Activated Carbon filters will be conveyed to the new used washwater equalisation tanks (UWWETs) and used washwater settlement tanks (UWWSTs) prior to onward transfer to the sludge balancing tank.

Residuals are then transferred from the new sludge balancing tank to the existing picket fence thickener. Sludge will be conditioned through polymer dosing and thickened within the existing picket fence thickener. Thickened sludge will then be transferred to the proposed sludge holding tank prior to dewatering.

Sludge dewatering will be undertaken using upgraded mechanical dewatering equipment, including polymer dosing, plate press, sludge collection and filtrate return systems. Filtrate and supernatant streams generated from the residuals management process will be returned to the head of the treatment process or to the appropriate upstream process stage, subject to final detailed design and operational requirements.

Dewatered sludge will be stored securely on site prior to removal by an appropriately authorised contractor. It will be transported to an appropriately authorised facility for treatment and recovery, with beneficial re-use prioritised where practicable in line with circular economy principles, regulatory requirements and Uisce Éireann's residuals management approach (see Chapter 14 – Resource and Waste Management).

A summary of new and retained residual management assets are set out in Table 3-3.

Table 3-3 — Proposed Residual Management Infrastructure.

Ref. no.*	Asset	Retained / New	No. Units	Area (m^2)	Unit Volume (m^3)
16	Used Washwater Equalisation Tank	New	3	335.9	412
17	Used Washwater Settlement Tank	New	3	385.54	492
19	Sludge Dewatering Building	Retained	1	58.46	-
20	Washwater Supernatant Recirculation - Pumping Station	New	1	33	15
21	Sludge Balance Tank	New	1	155.76	129
22	Sludge Holding Tank	New	1	175.92	151
23	Sludge Thickening Tank – picket fence thickener	Retained	1	28.27	69
28	Washwater Draindown Tank, inlet Pump Station and outlet Pump Station	New	1	428.83	400
29	Wastewater service return pumping station	New	1	10	4.8
30	Wastewater treatment system and percolation area	New	1	5.52	2.8
	Supernatant Balance Tank	Retained	1	69.19	205

* Reference numbers correspond to Figure 3-17.

Proposed Chemical Storage and Dosing Infrastructure

The proposed chemical storage and dosing infrastructure is summarised in Table 3-4. Storage volumes represent the maximum chemical storage capacity provided on site for assessment purposes. Chemical storage and dosing systems will be designed with appropriate containment, safe access, delivery, transfer, inspection and emergency response provisions in accordance with Uisce Éireann technical requirements and relevant health, safety and environmental requirements. Chemical deliveries will occur periodically, with delivery frequency dependent on operational demand and final detailed design.

Table 3-4 — Proposed Chemical Storage and Dosing Infrastructure.

Ref. No.*	Asset	Existing / Retained / Proposed	No. Units	Max. Area (m2)	Max. unit Volume (m3)
24	Fluoridation – Hydrofluorosilic Acid Bulk Tanks, Day Tank and Dosing System	Retained	2	26.95	10
25	Disinfection/ Treated Water Storage – 10% Sodium hypochlorite Bulk Storage Tanks	New	3 - one additional and two replacements of existing	11.61	3
26	Coagulation – 8% Aluminium Sulphate Bulk Storage Tanks	New	2	66.37	40
27	pH Adjustment – 96% Sulphuric Acid Bulk Storage Tanks	New	2	26.67	10
	pH Correction – Sodium Carbonate Building	New	1	312.5	N/a
	pH Correction – Sodium Carbonate Bulk Storage Silo	New	2	86.7	60
	Polymer Dosing System – Flocculation	Retained	1	N/a	N/a
	Polymer Dosing System – PFT & UWWETs	New	1	N/a	N/a
	Polymer Dosing System – Sludge Dewatering	New	1	N/a	N/a

* Reference numbers correspond to Figure 3-17.

3.2.4.2.2 Power Supply & Renewable Energy

There is existing electricity supply to the site. A new ESB medium voltage (MV) substation incorporating a 300 kVA transformer is proposed to meet anticipated increase in electricity demand. The new substation will be maintained and operated by the ESB.

The diversion of the existing overhead ESB in the west of the site, will be required for the Proposed Development. An ESB application has been submitted for this line diversion.

Solar PV will be provided for at the site, located to the south of the site and on tank roofs. Energy generated from the solar farm will supply the WTP. There will be no export of power to the Grid.

A back-up power supply, in the form of a connection for a standby diesel generator and plinth, is provided in the event of a power outage.

3.2.4.2.3 Ancillary works

Access Road & Pavement

Access and egress to site will be through the existing WTP entrance gate, on the L1111. No major alterations to the current access road are proposed. There is an existing security gate north of the building.

A new security fenceline and gate is proposed all around the operational area of the proposed works. The new ESB substation is located near the main entrance with dedicated security fencing and gate.

Additional access road extents (up to 1,100 m^2) will be laid to serve most of the proposed works such as new GAC filter gallery, new dewatering building, clean backwash tank, washwater treatment facilities, at the east of the current plant. The new road will be of asphalt and new pavements will be of permeable surfaces. There is concrete hardstanding around all proposed works. Appropriate lighting will also be provided in line with the provisions set out in Section 3.3.6.

Fencing / Boundary

There is existing timber and post fencing all around the site perimeter and along the existing internal access road at the south. There is an access gate at the entrance and a post and wire mesh fence (approx. 1.8 m high) and another access gate near the existing building. A new 2.4 m high palisade fence and security gate is proposed around the operational area of the site.

Stormwater Management

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 soakways proposed at different locations within the site. Some of the existing soakways will be abandoned with surface water captured and redirected to the new ponds and soakways.

Wastewater management

The existing septic tank is to be decommissioned and a new wastewater treatment system with percolation area is proposed at the northern side of the site. It will collect wastewater from existing toilets and proposed eye wash and handwash facilities. The new wastewater treatment system will be installed in accordance with a site suitability assessment to ensure it meets EPA requirements. The new wastewater treatment system will be designed in accordance with the EPA (2022) Code of Practice for Domestic Waste Water Treatment System. It is a requirement of the Mayo County Development Plan 2022-2028 that these are carried out by someone with Further Education and Training Awards Council (FETAC) level 6 in Supervisory Skills Award (SSA).

Site lighting

Post mounted luminaires are proposed on site, in addition to existing high-level lighting at the site. Access roads will be lit by proposed post mounted luminaires. Working areas between buildings/structures will be lit by wall mounted luminaires.

Landscaping
In terms of landscaping, the Lisglennon WTP site will be subject to landscaping and biodiversity enhancement measures, which will include but are not limited to:

- Planting of native hedgerows;
- Planting of native trees;
- Installation of bird and bat boxes;
- Scrub planting as an understory comprised of native Irish species, areas of wildflower mixes, all of which will be suitable for native pollinator species; and
- It is proposed to repurpose non-used parts of the site to promote the growth of wildflowers, native trees and hedgerows.

Where appropriate, additional topsoil will be spread and graded between 1 to 2 m to avoid impact to the existing trees and will be completed in advance of any planting. Placement of berms and bunding will be concentrated in the north and northwest of the site. Care will be taken not to dwarf the wall at the entrance and along the road. This will then be planted with new woodland mix. Proposed landscaping is shown in Drawing 10025936-ATK-L3-ZZ-DR-CE-211723.

3.2.4.3 Construction Works

The construction works at Lisglennon WTP will be undertaken in a planned and phased manner, with the objective of maintaining continuity of water treatment operations throughout the construction period, insofar as practicable. The existing treatment stream will remain operational while new process units, tanks, buildings, pipework and associated mechanical, electrical, instrumentation, control and automation infrastructure are constructed offline. Where temporary shutdowns, isolations or tie-ins are required, these will be planned in advance in consultation with Uisce Éireann Operations. Appropriate operational controls, including the use of available treated water storage, will be implemented to maintain continuity of supply.

Initial activities will comprise site establishment, site clearance, formation of temporary working areas and establishment of the site compound. Existing operational assets, buried services, process units and access routes will be identified and protected prior to the commencement of intrusive works. Construction activities will be managed in accordance with the CEMP, with controls implemented for noise, vibration, dust, surface water management, materials handling and waste management (see Section 3.3.4).

Bulk earthworks will be undertaken to facilitate the construction of the proposed process infrastructure, tanks, foundations, pipework corridors and access roads.

Priority will be given to enabling works that support operational resilience and facilitate subsequent tie-ins. These works will include construction of the new treated water reservoir and installation of key interconnecting pipework to provide additional treated water storage and assist in the management of planned shutdowns, testing and commissioning. Initial pipework installations will also establish connections to proposed downstream and upstream process units, including the chlorine contact tank, treated water pumping, UV treatment and associated dosing systems.

Based on the current design and ground investigation information, excavations at Lisglennon WTP are anticipated to extend generally to approximately 3 to 4 m below ground level (bgl), although excavation depths will vary locally depending on the requirements for tanks, foundations, pipework, roads and associated below-ground infrastructure. Ground investigation data (see Appendix 9-1 of Volume 3 of the EIAR) indicates that shallow bedrock is present across parts of the WTP site, typically at depths of approximately 1 to 2 m bgl. This will be taken into account during detailed design and construction phase, including the final excavation

methodology and opportunities for re-use of excavated material. General provisions for the management of excavated material is set out in Section 3.6.3.

It is currently estimated that construction of the new WTP process streams, tanks and associated infrastructure will generate approximately 10,878 m³ of excavated material. Approximately 5,945 m³ of fill is expected to be required to raise and form the proposed sludge treatment area to the east of the site. Suitable excavated material will be re-used on site where practicable, subject to geotechnical suitability and environmental testing. Any surplus or unsuitable material will be managed in accordance with the CRWMP (see Section 3.3.4).

The proposed treatment infrastructure will then be constructed in stages. Works will include construction of new flocculation tanks, clarifiers, rapid gravity filters, granular activated carbon filters, backwash facilities, chlorine contact tank, chemical dosing infrastructure, soda ash dosing building, pump house and UV building. Associated below-ground and above-ground pipework, valves, chambers, ducting, instrumentation and control interfaces will be installed progressively as each process area is developed. Mechanical, electrical, instrumentation, control and automation systems, including modifications to control panels and Supervisory Control and Data Acquisition (SCADA), will be installed and commissioned as the new process elements are brought into service.

Residuals management infrastructure will be constructed in parallel with the clean water process works where practicable. These works will include sludge balancing, sludge holding and dewatering infrastructure, together with associated pumping, polymer dosing, filtrate return and ancillary systems. Temporary residuals management measures, such as mobile dewatering equipment, may be used where required to maintain continuity of sludge processing during construction. Existing residuals management infrastructure will only be decommissioned, refurbished or repurposed once replacement systems are operational and available for service.

The new and upgraded treatment processes will be commissioned progressively. Individual process units will be tested and brought into service in stages, allowing flows to be transferred incrementally and enabling refurbishment or integration of retained existing assets where required. Final commissioning will include performance testing, verification of hydraulic and process performance, testing of instrumentation and control systems, and confirmation that the upgraded plant can operate as an integrated treatment system.

Ancillary works, including access roads, hardstanding, drainage, security fencing and lighting, will be completed as the main construction works progress and finalised following completion of the principal process works. The proposed solar PV array will be installed after completion of the main WTP upgrade works, where practicable, to avoid conflict with construction access, laydown areas and plant movements. On completion of construction, temporary works will be removed and disturbed areas will be reinstated. Landscaping and biodiversity enhancement measures will then be implemented in accordance with the landscape design and biodiversity net gain proposals submitted as part of this EIAR.

Works at the Lisglennon WTP are anticipated to take 35 months to complete. The works may be undertaken in stages and are not necessarily sequential, subject to programme, construction logistics, commissioning requirements and coordination with other elements of the Proposed Development.

3.2.4.4 Operation and Maintenance

The upgraded Lisglennon WTP will continue to operate as a key water treatment facility within the regional supply system. The upgraded plant will integrate retained existing assets with newly constructed treatment streams, storage, chemical dosing, residuals management and control systems to provide an expanded and more resilient treatment process.

Operation of the WTP will be controlled through automated monitoring and control systems, supported by routine operator oversight. The main treatment processes will include coagulation and flocculation, clarification,

rapid gravity filtration, granular activated carbon filtration, disinfection, pH correction, treated water storage and residuals management. Process performance will be monitored through instrumentation, sampling and operational checks to confirm that treated water quality and process performance remain within the required operational parameters.

Routine inspection and planned preventative maintenance will be undertaken for civil, mechanical, electrical, instrumentation, control and automation assets. This will include inspection and maintenance of tanks, filters, pumps, valves, chemical storage and dosing systems, UV units, control panels, instrumentation, pipework, access infrastructure and site drainage. Maintenance activities will generally be undertaken within the operational WTP site and will be managed in accordance with Uisce Éireann operational procedures and relevant health, safety and environmental requirements.

Chemical storage and dosing systems will be operated and maintained in accordance with applicable safety and environmental controls, including inspection of bunded areas, transfer systems and associated pipework. Residuals generated during the treatment process will continue to be managed on site through the upgraded residuals management infrastructure, including sludge balancing, thickening, holding, dewatering and secure storage prior to removal from site by an appropriately authorised contractor.

Operational traffic associated with the upgraded WTP will include staff movements, routine maintenance visits, chemical deliveries, sludge collection and occasional specialist maintenance. The frequency of these movements will vary depending on operational requirements but will remain typical of an operational water treatment plant of this scale. Solar PV infrastructure, site lighting, security fencing, access roads, hardstanding, drainage, landscaping and biodiversity enhancement areas will also be inspected and maintained as part of routine site operations.

The upgraded WTP will be integrated into the wider network control strategy and operated to support continuity of supply, process resilience and compliance with drinking water quality requirements.

3.2.5 Treated Water Pipelines B, C, D and E: Lisglennon WTP to Lough Talt WTP

3.2.5.1 Existing Treated Water Pipelines

The existing pipeline conveys treated water from Lisglennon WTP to Ballina, Bonniconlon and surrounds. Between Lisglennon WTP and Lisglennon RWS&PS, the existing treated water pipeline runs parallel to the raw water mains. From the Lisglennon RWS&PS, the existing pipeline continues east along the L11109 before joining the L5147. From the L5147, the route crosses a section of agricultural land until the R314. The route then follows the R314 southwards to Belleek Crossroads (where there is an existing offtake to Ballina), before turning east onto the L5140. From there, the route crosses through the grounds of Belleek Castle and woodland to the L1120, Quay Road, and crosses the River Moy at an existing crossing. On the eastern side of the River Moy, the existing pipeline supplies treated water to Creggs Road and Bonniconlon via an offtake.

There is no existing pipeline from Creggs Road to Lough Talt. The route corridor has been developed to follow existing public roads, existing utility corridors and existing pipeline alignments where practicable, with sections across private lands where required to achieve hydraulic, engineering, environmental and constructability objectives.

3.2.5.2 Proposed Treated Water Pipelines

The proposed treated water pipeline route corridor between Lisglennon WTP and Lough Talt WTP extends for approximately 30.2 km. From Lisglennon WTP, the route corridor follows the existing pipeline towards the

existing River Moy crossing infrastructure. Within the grounds of Belleek Castle and Woodlands, the route deviates from the existing pipeline and follows a private track, to the River Moy (see inset in Figure 3-20).

The proposed pipeline will then tie into either side of the existing watermain that crosses River Moy. There are no works proposed in the River Moy. On the eastern side of the River Moy, the route corridor follows the L1101, Creggs Road, eastwards, passing through the junction with the N59 and continuing to the junction with the L5132, Behy Road. The existing pipeline on Creggs Road and Bonniconlon Offtake will be retained and remain in service, and do not form part of the Proposed Development.

The route then follows the L5132 eastwards onto the L51333 at Behy More for approximately 500 m. At this location, the route leaves the public road corridor and crosses private lands, including a crossing of the Glenree / Brusna River. The route then rejoins the public road network on the R294, Bonniconlon Road, in the vicinity of the junction with the L51341 at Corrimbla South, before continuing along the R294 to the proposed Bonniconlon BPS as described in Section 3.2.6.

From the proposed Bonniconlon BPS, the route corridor crosses the L5135 and the Srafaungal River within private lands before rejoining the R294. It then continues eastwards along the R294 to Bonniconlon village. From Bonniconlon village, the route follows the L51172, Newtown Road, passing the Bonniconlon Reservoir site, as described in Section 3.2.9, before continuing onto the Drumsheen Loop (walking trail) / L51357. The route then crosses the R294 onto a private commonage leading to the proposed Windy Gap BPT, as described in Section 3.2.7.

From the proposed Windy Gap BPT, the route corridor rejoins the R294 and continues eastwards towards Lough Talt WTP, as described in Section 3.2.8.

The route corridor passes through the outskirts of Ballina and through Bonniconlon and traverses a predominantly rural landscape, including agricultural lands, public roads, private lands, woodland areas and dispersed residential properties. Land use, access, residential amenity, traffic, biodiversity, watercourse crossings, cultural heritage and agricultural considerations associated with the route corridor are assessed in the relevant specialist chapters of this EIAR. The surrounding area is predominantly agricultural land (See Chapter 8 – Agronomy), with a number of private and residential properties in proximity (see Chapter 6 – Population and Human Health).

3.2.5.3 Proposed Upgrades

The proposed route corridor from Lisglennon WTP to Lough Talt WTP is illustrated in Figure 3-20. It is divided into four discrete sections:

- Pipeline B – Lisglennon WTP to Existing River Moy Crossing;
- Pipeline C – Existing River Moy Crossing to Bonniconlon BPS;
- Pipeline D – Bonniconlon BPS to Windy Gap BPT; and
- Pipeline E – Windy Gap BPT to Lough Talt WTP.

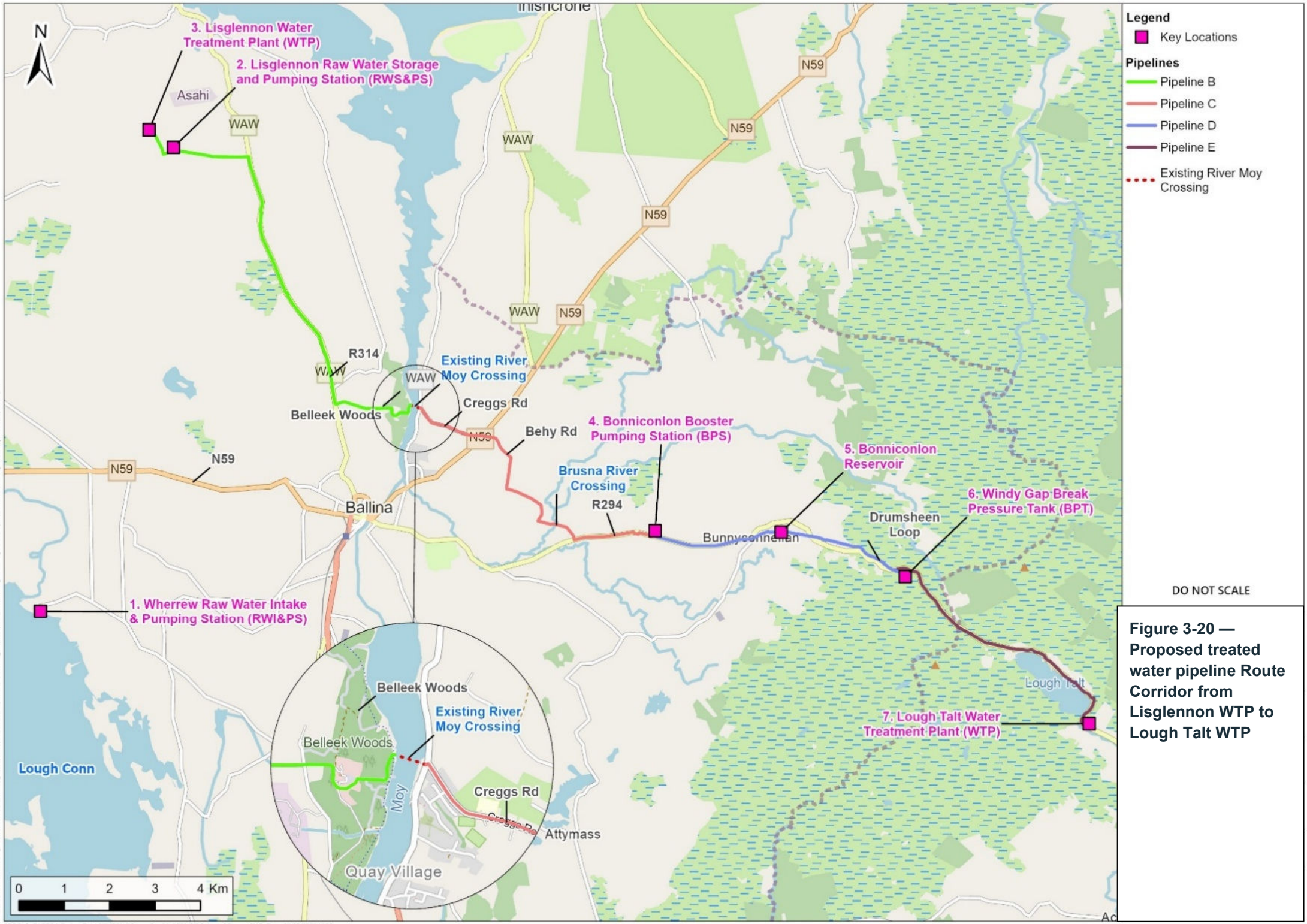


Figure 3-20 — Proposed treated water pipeline Route Corridor from Lisglennon WTP to Lough Talt WTP

The proposed works for each section of the treated water pipelines are as follows:

- Pipeline B – Lisglennon WTP to Existing River Moy Crossing:
  - New pipeline, approx. 710 mm diameter from Lisglennon WTP to Junction R314 and Belleek Rd;
  - New pipeline, approx. 560 mm diameter from Junction R314 and Belleek Rd to Existing River Moy Crossing;
  - Tie in with the existing watermain to the west of the Existing River Moy crossing;
  - Transfer of a number of supply connections from the existing network to the new trunk main, including provision of flowmeters connected to the telemetry system;
  - Connection to existing Ballina Offtake;
  - Abandon existing 400 mm to 500 mm diameter trunk main between Lisglennon WTP and Ballina Town; and
  - Abandon existing 350 mm mains between the R314 and Quay Road.
- Pipeline C – Existing River Moy Crossing to Bonniconlon BPS Trunk Main:
  - Tie in with the existing watermain to the east of the Existing River Moy crossing;
  - New pipeline, approx. 500 mm to 560 mm diameter, from River Moy Crossing to Bonniconlon BPS; and
  - New offtake to facilitate a future connection to Lough Easkey Regional Water Supply Scheme (RWSS) will be provided at the Creggs Road and N59 junction.
- Pipeline D – Bonniconlon BPS to Windy Gap BPT Trunk Main:
  - New pipeline, approx. 500 mm – 560 mm diameter, from the new Bonniconlon BPS to Windy Gap BPT on the R294 / L51172 / L51357.
- Pipeline E – Windy Gap BPT to Lough Talt WTP Trunk Main:
  - New pipeline, approx. 450 mm diameter from Windy Gap BPT to the existing Lough Talt WTP on the R294.

Ancillary pipeline infrastructure, including valves, fittings, marker posts, flowmeters, washout/scour arrangements, air valves, chambers, manholes and inspection chambers, will be installed as required to facilitate the operation, monitoring, maintenance, flushing, scouring and identification of the treated water pipeline system. The pipeline sections are summarised in Table 3-5. The drawings are provided in Appendix 3-2 of Volume 3 of the EIAR (Drawings 10025936-ATK-L2-ZZ-DR-CE-211103 to -51).

Table 3-5 — Summary of proposed treated water pipeline sections

Section	Approx. Diameter (mm)	Start location	End location	Approx. length (km)
Pipeline B	710	Lisglennon WTP	Junction R314 and Belleek Rd	8.4
Pipeline B	560	Junction R314 and Belleek Rd	Existing River Moy Crossing	2.0
Pipeline C	500-560	Existing River Moy Crossing	Bonniconlon BPS	7.2
Pipeline D	500-560	Bonniconlon BPS	Windy Gap BPT	6.0
Pipeline E	450	Windy Gap BPT	Lough Talt WTP	6.6

3.2.5.4 Construction

The construction methodology for Treated Water Pipelines B, C, D and E has been developed based on the current stage of design and the environmental assessments in this EIAR. The final construction methodology, phasing, temporary works arrangements and crossing techniques will be confirmed by the Appointed Contractor during detailed design and construction planning. Any refinements will remain within the project description, design parameters and environmental assessments of this EIAR and will be implemented in accordance with the environmental controls set out in the construction management plans (Section 3.3.4).

All works will be undertaken in accordance with construction provisions set out in Section 3.3. Pipeline construction will be undertaken progressively in discrete sections along the route corridor, and which may be installed at the same time, subject to programme, traffic management requirements, environmental constraints, land access and construction logistics. The works may therefore be phased and are not necessarily sequential.

Temporary working areas and site compounds will be established to support the works, as described in Section 3.3.6. The pipeline route will predominantly follow existing public roads, with sections in private lands, where required. Works within public roads will generally be undertaken within a single traffic lane where practicable, with temporary traffic management measures implemented to maintain safety for road users, pedestrians, cyclists, local residents and the construction workforce. Traffic management measures may include stop/go systems, temporary traffic signals, lane closures, short-duration road closures and signed diversions, as agreed with the relevant roads authority.

Where the pipeline is installed within private lands, the typical construction working width will generally be approximately 20 m, unless otherwise agreed with the relevant landowner or reduced locally in response to environmental, cultural heritage, access, topographical or constructability constraints. The working width will accommodate excavation, pipe stringing, temporary storage of excavated material, plant movement, jointing, backfilling and reinstatement. The working width may be locally widened at bends, tie-ins, crossings, launch and reception pits, or other constrained locations where additional working space is required.

Before construction commences, the Appointed Contractor will undertake pre-construction surveys and confirmatory investigations to verify ground conditions, buried services, existing drainage, watercourse crossing locations, road constraints, access arrangements, ecological constraints, invasive species constraints and cultural heritage constraints (Section 3.3.1). The route will be set out and clearly demarcated prior to construction. Existing utilities and services will be identified, protected, diverted or supported as required in agreement with the utility/service providers.

Where works have the potential to affect access to private lands, dwellings, farms, businesses or community facilities, access arrangements will be agreed in advance with affected landowners and occupiers. There are numerous receptors identified within 100 m of the Red Line Boundary, including approx. 300 private residences, 42 businesses, 14 commercial properties (including nine schools), seven hospitals, 16 facilities, 36 local community partnerships and 36 land parcels, (see Chapter 6 – Population and Human Health, Chapter 8 – Agronomy and Chapter 15 – Roads, Traffic and Transportation). Construction activities will be managed to minimise disruption where practicable, with advance notification provided in accordance with the Stakeholder Communications Plan, to be prepared by the Appointed Contractor (see Section 3.3.4.3).

The pipeline will primarily be installed using conventional open-cut techniques. Trenchless techniques will be used where required to avoid or minimise disturbance to sensitive watercourses, existing infrastructure, constrained locations or other environmental or engineering constraints. The anticipated crossing methodologies for surface water features are identified in Chapter 7 - Biodiversity, Chapter 10 – Water (Hydrology and Hydrogeology) and Chapter 17 – Cultural Heritage. Final crossing methodologies will be confirmed by the Appointed Contractor following confirmatory surveys.

The start of Pipeline B and the majority of Pipeline A, as described in Section 3.2.3, will be installed in parallel within the same trench between the treated water storage reservoir at Lisglennon WTP and the site access to Lisglennon RWS&PS on the L11109. This approach will reduce the extent of excavation and minimise repeated disturbance within this section of the route corridor.

Excavated material will be managed in accordance with the CRWMP. Suitable excavated material will be re-used as trench backfill above the pipe surround where practicable, subject to geotechnical suitability and environmental testing. Surplus or unsuitable material will be removed from the working area and managed in accordance with the CRWMP. A project-level summary of excavated materials is provided in Section 3.6.

Existing field drains, roadside drains and agricultural drainage systems that intersect the construction working width will be surveyed and recorded before works commence. Existing drainage will be maintained during construction through temporary diversions, temporary culverting or other suitable measures. Drains affected by the works will be reinstated following pipe installation to maintain existing drainage function, unless otherwise agreed with the relevant landowner and drainage authority. Where required, pre-construction field drainage measures will be installed to maintain existing drainage patterns during construction.

Following installation, pressure testing, disinfection, flushing and commissioning of the treated water pipelines will be undertaken in accordance with Uisce Éireann requirements and relevant operational procedures. Water generated during testing, flushing or disinfection activities will be managed in accordance with the CEMP (Section 3.3.4.1) and the scour management proposals set out in Section 3.9. Discharge locations, rates and controls will be confirmed prior to commissioning and will be subject to appropriate environmental protection measures.

On completion of pipeline installation and commissioning, trenches will be backfilled. Public roads, private tracks, agricultural lands, field boundaries, drains, verges, hedgerows and other affected features will be reinstated, as appropriate, in accordance with the CEMP (Section 3.3.4.1), landowner agreements, road opening licence requirements, the Tree Protection Plan (see Section 3.3.4.4) and the landscape and biodiversity proposals included in this EIAR. Temporary working areas, compounds, temporary access tracks and redundant temporary works will be removed.

Where the proposed pipeline route is laid in areas where peat is present, an appropriate trench reinstatement to reinforce these sections such as a proprietary trench support system, with careful groundwater management will be developed. The trench build up will be dependent on the soil strata and will be as per the approved final detail design by the Contractor. It is envisaged that the trench will be backfilled with imported granular fill material and will be carefully compacted to avoid punching into the existing strata. Once backfilled, the road surface reinstatement in these sections will be as per the requirements of the relevant Road's authority. The road surfaces will be protected by using road plates or bog mats. All works in peat will be managed in accordance with the CEMP and other relevant construction management plans (see Section 3.3.4).

3.2.5.4.1 Open-Cut techniques

Open-cut installation will be the primary construction technique for the treated water pipelines, except where trenchless techniques are required due to environmental, engineering, traffic, access or constructability constraints. Open-cut installation will generally involve excavation of a trench, placement of pipe bedding, installation and jointing of the pipe, placement of pipe surround material, backfilling and reinstatement.

Based on the current design and ground investigation information, for single pipelaying, trench widths are anticipated to be in the range of 1 to 1.5 m along much of the route and trench depths are anticipated to be approximately in the range of 2 to 4 m for the majority with a few locations up to 6 m deep. However, the depths will vary locally depending on pipe diameter, existing ground levels, required cover, road construction, ground conditions, existing services, watercourse / culvert crossings and hydraulic design requirements. Trench dimensions will be confirmed by the Appointed Contractor during detailed design and construction phase.

A suitable granular bedding layer will be placed at the base of the trench prior to pipe installation. Pipe sections will then be lowered into the trench, jointed and aligned. Granular pipe surround material will be placed around and above the pipe to provide protection and support. Marker tape, tracer wire, marker posts, valves, fittings, chambers, air valves, scour arrangements and other ancillary pipeline infrastructure will be installed as required.

The remaining trench will be backfilled using suitable material. Within private lands, suitable excavated material will be re-used as backfill where practicable, subject to geotechnical suitability and environmental testing. Within public roads, reinstatement will be undertaken using suitable engineered backfill, including cement bound granular material where required, and road surfaces will be reinstated in accordance with the requirements of the relevant roads authority and applicable road opening licence conditions.

A number of recreational walking and cycling trails intersect the works, notably in Belleek Woods (Section 3.2.5.4.4) and near Bonniconlon (Glen Loop – Bunnyconnellan Walking Trail, Drumsheen Loop – Bunnyconnellan walking trail and Sligo Way (Long Distance Waymarked Way) trails). Trails will be reinstated in line with the requirements of the relevant local authority and landowner agreements. The pipeline route also overlaps with the EuroVelo 1 Ireland – Atlantic Coast Route (road cycling trail). All works intersecting public trails will be managed in accordance with the CEMP and other relevant construction management plans (see Section 3.3.4).

Where open-cut installation is used to cross minor field drains or low-sensitivity drainage features, flows will be maintained using temporary over-pumping, temporary fluming, damming and pumping, temporary culverting or other suitable measures. Sediment prevention and pollution control measures will be implemented in accordance with the CEMP (Section 3.3.4.1). Affected drains will be reinstated following pipeline installation to maintain existing drainage function.

3.2.5.4.2 Trenchless Methods

Trenchless installation techniques will be used where required to avoid or minimise disturbance to sensitive watercourses, existing infrastructure, roads, embankments, constrained locations or other environmental or engineering constraints. The selection of the final trenchless technique will be confirmed by the Appointed Contractor based on ground conditions, crossing length, alignment, depth, available working area, environmental sensitivity and constructability. Trenchless techniques may include horizontal directional drilling (HDD), pipe jacking, auger boring, pipe ramming or other equivalent methods.

For trenchless crossings, launch and reception pits will be established outside the watercourse channel and outside sensitive riparian areas where practicable. The pipeline or casing will then be installed beneath the obstacle without open excavation through the watercourse bed. The final locations and dimensions of launch and reception pits will be confirmed during detailed design.

HDD is a trenchless installation method in which a steerable drill head is launched from a surface entry point and guided along a predetermined alignment to a reception point, typically beneath existing infrastructure, roads or watercourses. The process generally comprises of a pilot bore, progressive enlargement of the bore to the required diameter, and pullback of the product pipe through the enlarged bore. Drilling fluid, typically bentonite-based, may be used to stabilise the bore, remove arisings and reduce friction during installation.

Where HDD is used, drilling fluids will be managed through a site-specific drilling fluid management procedure. Only suitable drilling fluids will be used, and measures will be implemented to minimise the risk of drilling fluid loss to ground or surface water. These measures may include monitoring of drilling pressures, inspection of the ground surface and watercourse banks, provision of spill response materials, and implementation of contingency measures in the event of drilling fluid breakout.

Pipe ramming is a trenchless technique that may be used to install a casing pipe beneath roads, watercourses, embankments or other obstacles where ground conditions and alignment are suitable. The method involves

advancing a steel casing from a launch pit using a pneumatic or hydraulic ramming system. The material within the casing is removed during or after installation, and the carrier pipe is then installed within the casing. The annulus may be sealed or grouted as required by the final design.

Pipe jacking or auger boring may also be used where suitable. These methods generally involve installation of a casing or carrier pipe from a launch pit to a reception pit using controlled excavation or boring techniques. The final method will be selected to achieve the required crossing based on geotechnical considerations while minimising surface disturbance and protecting environmental receptors.

At watercourse crossings, where trenchless works are planned, these will be undertaken in accordance with the CEMP and relevant environmental controls (see Section 3.3.4). Plant, fuels, lubricants, drilling fluids and other materials will be stored and managed to prevent pollution. Where required, an Ecological Clerk of Works (ECoW) will oversee works at sensitive crossings.

3.2.5.4.3 Surface Water Feature / Watercourse Crossings

There are approx. 30 surface water feature crossings which have been identified along the pipeline route, comprising of approx. 18 EPA-identified watercourses and 12 field drains. These are described in Chapter 7 - Biodiversity and Chapter 10 – Water (Hydrology and Hydrogeology). 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 (see insert in Figure 3-20).

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 subject to geotechnical considerations. Open cut methodology is the preferred option for crossing field drains, many of which were observed as dry.

3.2.5.4.4 Belleek Castle and Woodland

Belleek Castle and Woodland is a site of cultural heritage value set within an extensive woodland estate including the Belleek Wood Greenway Cycling Trail, Belleek Multi Access Walking Trail. In this location, the proposed pipeline route corridor follows an existing private track through the grounds to minimise interaction with mature trees, woodland habitat, built heritage features and estate infrastructure as well as avoid areas where non-native invasive species have been identified (see Chapter 7 – Biodiversity).

Construction works through Belleek Castle and Woodland will be planned and managed in accordance with the Tree Protection Plan submitted as Appendix 7-1, Volume 3 of this EIAR, together with the CEMP and any site-specific ecological and arboricultural requirements (see Section 3.3.4). Works in this area will be supervised, where required, by a suitably qualified ECoW and/or arborist. The objective will be to maintain the pipeline within the defined working corridor, minimise disturbance to retained trees and woodland habitat, and avoid unnecessary encroachment into Root Protection Areas.

The limits of the working area will be clearly demarcated prior to construction. Temporary protective fencing, ground protection or other physical demarcation measures will be installed where required to define the construction corridor, protect retained trees and Root Protection Areas, and control the movement of plant,

materials and personnel. Construction traffic will be directed along the existing track or other agreed access routes, insofar as practicable.

Excavated material and construction materials, including pipe sections, will not be stored within Root Protection Areas. Where excavation arisings are generated within the woodland area, they will be removed from sensitive areas as soon as practicable and transferred to an appropriate designated holding or stockpile area outside Root Protection Areas, subject to the requirements of the CEMP and the CRWMP (Section 3.3.4).

The pipeline alignment has been developed to reduce the potential for interaction with tree root systems. However, localised areas have been identified where trenching works may encounter roots associated with retained trees. Where works are required in proximity to retained trees, excavation will be undertaken using low-impact techniques, such as hand excavation or vacuum excavation, where required by the Tree Protection Plan or arboricultural supervision. Where roots are encountered, works will be undertaken in accordance with arboricultural guidance to avoid unnecessary severance or damage. Root barrier membrane may be installed where required to protect retained roots and prevent future conflict between root systems and the installed pipeline.

Plant selection and construction methods will be adapted to the sensitivity of the woodland setting. Smaller plant and low-ground-pressure equipment will be used where practicable within constrained or sensitive areas. Where heavier plant is unavoidable, appropriate ground protection measures will be implemented to reduce the risk of soil compaction within or adjacent to Root Protection Areas. Where compaction risk or localised compaction is identified, remedial measures such as soil aeration will be undertaken in accordance with arboricultural advice.

On completion of pipeline installation, disturbed areas within Belleek Castle and Woodland will be reinstated in accordance with the Tree Protection Plan, CEMP, landowner requirements and the landscaping and biodiversity proposals included in this EIAR (see Section 3.3.4).

3.2.5.5 Operation and Maintenance

The proposed treated water pipelines will operate continuously as part of the wider water supply network, conveying treated water between Lisglennon WTP and downstream infrastructure. The pipelines will operate for their design life with minimal intervention, with flows governed by upstream pumping and downstream hydraulic conditions.

Routine operation and maintenance activities will primarily comprise periodic inspection and maintenance of pipeline infrastructure, including valves, fittings and chambers. Valves will be exercised at regular intervals to ensure continued operability.

Maintenance activities will also include periodic flushing and scouring of the pipelines, where required, to maintain water quality and hydraulic performance.

The pipeline system will be monitored through the network control system, enabling operational performance to be tracked and allowing maintenance activities to be undertaken as necessary.

Operational access to the pipeline will be via permanent wayleaves across private lands, where required, and via the public road network where pipelines are located within road corridors.

3.2.6 Bonniconlon Booster Pumping Station (BPS)

3.2.6.1 Bonniconlon Booster Pumping Station site

The proposed Bonniconlon BPS site is situated at Carralavin, Bonniconlon, Ballina, Co. Mayo. It is a greenfield site located at the junction of the R294 Ballina Road and L5135 Carrownlabaun, approx. 1.8 km west of Bonniconlon. The site is bounded to the east and south by a sod ditch with areas of hedgerows further along the eastern boundary, and on the northern and western boundaries. There is an agricultural gate on the eastern boundary of the site. The River Srafaungal runs through the field on the other side of the L5135 before continuing under the R294. The proposed site is shown in Figure 3-21.



Figure 3-21 — Proposed Bonniconlon BPS Site

The new BPS will be constructed to transfer the full allotment of flow to Lough Talt WTP. The BPS will receive water under gravity from the Lisglennon WTP, and pump it over the local high point, to the Windy Gap BPT (Section 3.2.7), from where it gravitates to the Lough Talt WTP (Section 3.2.8).

A site layout of the proposed Bonniconlon BPS is shown in Figure 3-22, and will consist of:

- A new 320 kW booster pumping station (approx. 150 m², approx. 8 m tall) with pumping area, control room and welfare facilities, noise proofing by means of thick walls and sound-proofing measures on doors and windows (Ref. No. 1, Figure 3-22);
- Two surge vessels (approx. 20 m³ each) (Ref. No. 3, Figure 3-22);
- ESB substation (approx. 24 m², 3 m tall) with dedicated fence and entrance (Ref. No. 2, Figure 3-22);
- A new permanent standby generator (Ref. No. 4, Figure 3-22);
- Provision of solar PV infrastructure to supplement site power demand; and
- Installation of new flowmeter and associated works (Ref. No. 6, Figure 3-22);
- Ancillary site development works, including access, fencing, storm water management including pond (Ref. No. 7, Figure 3-22), wastewater management (Ref. No. 5, Figure 3-22), potable water supply, site lighting and landscaping.

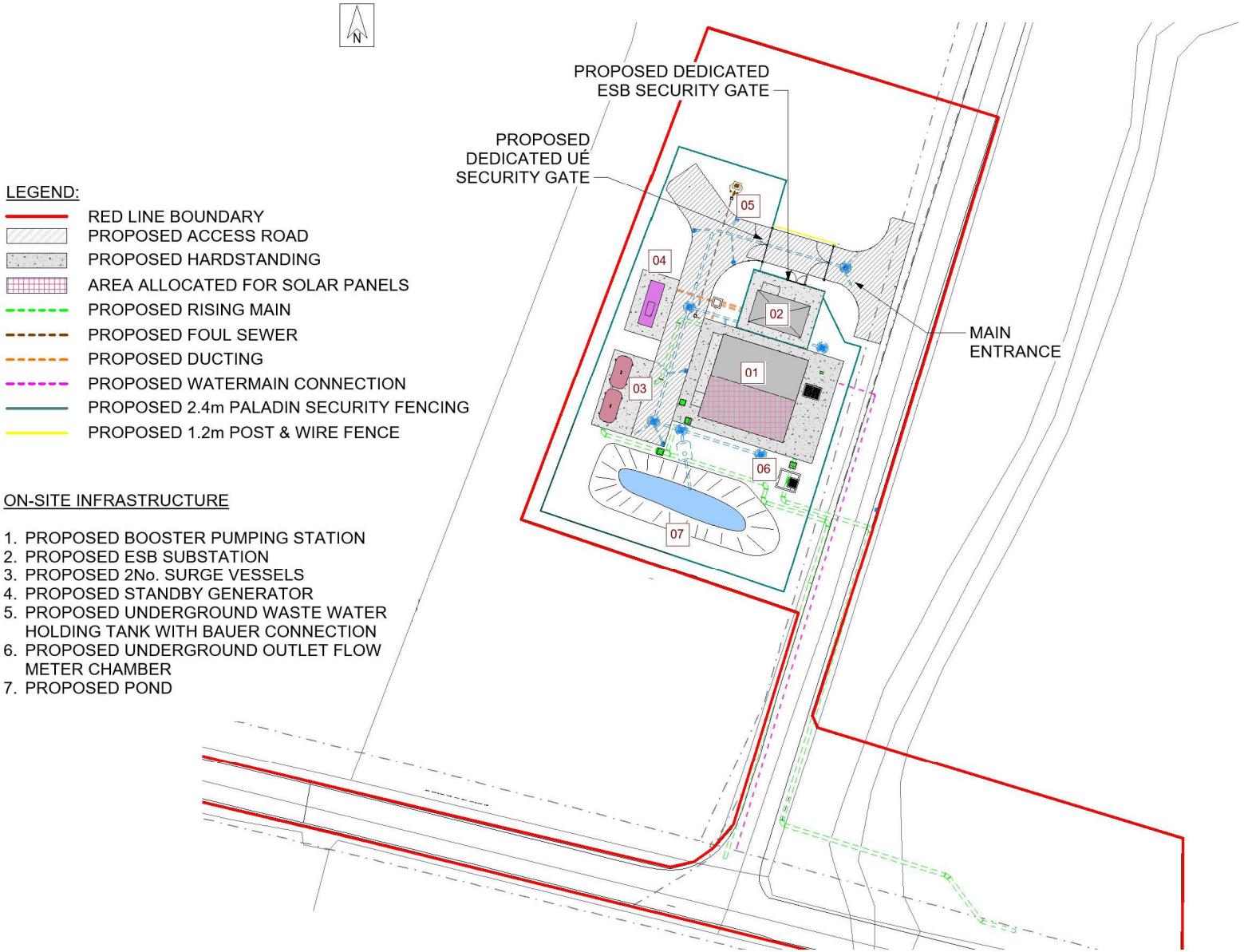


Figure 3-22 — Site layout of the new Bonniconlon BPS

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The BPS building (Ref. No. 1, Figure 3-22) will include a small internal loading bay and setting down area, space for surge vessel compressors if required, four Pumping bays, a control room, and welfare facilities including a toilet and washbasin.

The pump station will operate in a duty/assist/standby/standby configuration, with one duty pump operating the majority of time, with the assist pump coming online in times of maximum or increased demand in the Ballina and Lough Talt RWSS.

Two surge vessels (Ref. No.3, Figure 3-22), each approx. 20 m^3, will be installed to act as a damper to prevent excessive surge pressures at the pump station as well as prevent sub atmospheric pressure conditions from occurring in the up and downstream pipelines.

3.2.6.1.1 Power supply and renewable energy

An ESB MV substation (Ref. No. 2, Figure 3-22) will be provided for the pump station site, maintained and operated by the ESB. A substation and transformer of 400 kVA is proposed to provide sufficient power to the site. The substation will be supplied by the ESB and will be via either underground cable connection or overhead line, from the R294.

A back-up power supply, in the form of a permanent standby 400 kVA diesel generator (Ref. No. 4, Figure 3-22), will be provided in the event of a power outage to keep two pumps operational and prevent the resulting interruption of water supply. The proposed generator will have a built-in fuel storage tank capable of powering the generator for six hours, the estimated size of the embedded fuel tank will be approximately 800 to 1000 L, based on currently available models. The generator will be appropriately bunded.

Roof mounted solar panels will be installed on the BPS building, which will be used to supplement the power requirements of the BPS. Additional details are provided in Section 3.5.

3.2.6.1.2 Flowmeter installation

Installation of a flowmeter and associated works will be undertaken within the Bonniconlon BPS site, immediately outside of the pumping station building (Ref. No. 7, Figure 3-22). Associated works include short pipeline/ducting sections to connect to the pressure monitoring, control and telemetry systems (located inside the pumping station), isolation valves, flow meter chambers and access covers.

3.2.6.1.3 Ancillary Works

This section describes the ancillary works required for the Bonniconlon BPS site, in addition to the proposed main works mentioned above.

Access

Access and egress to the Bonniconlon BPS site will be through a proposed access road off the L5135 local road. The proposed main entrance will be situated approximately 100 m North off the R294 onto the L5135, in accordance with the Mayo County Development Plan 2022-2028.

The ESB substation will have its own dedicated entrance gate and access for ESB personnel. The main entrance of the BPS is shared with ESB personnel. The rest of the site will be accessed by authorised personnel only.

Fencing / Boundary

A 2.4 m high paladin security fencing and security gates will be provided around the operational area. There will be a dedicated 2.4 m high paladin fencing and security gate for ESB substation. A short section of 1.2 m high post and wire mesh fence will be provided along the shared access road.

The entire site will be bound by hedgerows with trees and woodland mix.

Stormwater Management
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 (Ref. No. 7, Figure 3-22).

Wastewater Management
Wastewater from welfare facilities will be collected by proposed wastewater network within site, into an underground wastewater holding tank (Ref. No. 5, Figure 3-22), tankered away periodically and disposed of offsite to an appropriate treatment facility.

Potable Water Supply
A potable water connection for the BPS site's water supply will be taken from the existing 100 mm diameter watermains along the R294 road.

Site Lighting
Low level bollard lighting will be provided along the access road and paths to allow for a safe access throughout the site. Centrally located wall mounted luminaires will be provided at substation and Pumping station building. Refer to Section 3.8 for overall site lighting for the Proposed Development.

Landscaping
The proposed site is situated in an agricultural grassland area of low ecological value and will require minimal plant removal. The site has no record of invasive species and may require some removal of hedgerow within the roadside verge for the new access road and sightlines.

The site will therefore be screened from view of the public road and neighbouring properties. Proposed landscape includes planting and seeding of the following:

- Wet grassland mix in the pond area.
- Woodland mix for screening to the north of the site.
- 5 m strip of Woodland mix Screen planting to the south of the site.
- Hedgerow mix with standard trees (approx. 5 to 10 m spacing) to line the perimeter of the site to the south, east and west.

Evergreen trees and/or shrubs native to the area will be instated as a hedgerow between the road and site boundary fence to screen off the site infrastructure. The hedgerow will be allowed to rewild and grow unrestricted to provide biodiversity enhancement to the agricultural grassland site in line with UÉ policy of biodiversity net gain. Proposed landscaping is shown in Drawing 10025936-ATK-B1-ZZ-DR-CE-211723 (Appendix 3-1 of Volume 3 of the EIAR).

An indicative visualisation for the proposed Bonniconlon BPS is shown in Figure 3-23.



Figure 3-23 — Bonniconlon BPS - Visualisation (for indicative purposes only)

3.2.6.2 Construction Works

The construction works at the proposed Bonniconlon BPS will comprise of the development of a new standalone booster pumping station facility, including civil, mechanical, electrical, instrumentation, control and automation infrastructure, together with associated access, drainage, security, landscaping and biodiversity measures. The final construction methodology, phasing and temporary works arrangements will be confirmed by the Appointed Contractor during detailed design and construction planning. and will be implemented in accordance with the relevant construction management plans (see Section 3.3.4).

The Bonniconlon BPS will be required to transfer treated water from Lisglennon WTP onwards to the Windy Gap BPT and Lough Talt WTP. Accordingly, construction, testing and commissioning of the Bonniconlon BPS will be completed before the cessation of abstraction from Lough Talt and before any works at Lough Talt WTP that are dependent on the availability of the new treated water supply. This sequencing will support continuity of supply to the Lough Talt supply area during the transition from the existing source to the proposed supply arrangement.

Initial works will include site establishment, installation of temporary working areas, site clearance, construction of the new site access from the L5135, and formation of the site platform. Construction traffic will access the site from the L5135, and temporary traffic management measures will be implemented as required in accordance with the Construction Works Traffic Management Plan (CWTMP) and in consultation with the relevant roads authority.

Based on current ground investigation information, excavations at the Bonniconlon BPS site are anticipated to be relatively shallow, generally approximately 0.5 m to 1.0 m bgl, and for buildings, it will vary from approx. 2 m to 3 m depending on the requirements for foundations, buried pipework, chambers, drainage, ducting and formation levels. Topsoil and subsoil will be stripped separately and stored within designated stockpile areas inside the red line boundary, subject to appropriate environmental controls. Suitable excavated material will be re-used on site where practicable, including for backfilling, site grading and landscaping, subject to geotechnical

suitability and environmental testing. General provisions for management of excavated materials are set out in Section 3.6).

Any surplus or unsuitable excavated material, including rock where encountered, will be managed in accordance with the CRWMP. Material requiring removal from site will be transported to an appropriately authorised facility for recovery, treatment or disposal, as appropriate. Stockpiles will be located away from drainage features and managed to prevent sediment runoff, dust generation and contamination of surface water or groundwater.

There is potential for localised interaction with groundwater or perched water during excavation works. Where dewatering is required, water will be collected and treated through settlement tanks, silt control measures or other appropriate treatment systems prior to discharge. Any discharge from construction dewatering will be undertaken in accordance with the water management measures set out in the CEMP and relevant environmental controls (see Section 3.3). Temporary drainage measures may be installed to intercept and divert clean surface water away from excavation areas, reduce runoff entering the works area and minimise the generation of silty water.

Temporary access roads, hardstanding and working areas will be formed as required to facilitate safe construction access, plant movement, material delivery and equipment installation. Material arising from excavation of temporary access or working areas will be managed in accordance with the CRWMP and re-used on site where suitable and practicable (Section 3.3.4.5).

Foundations and concrete slabs will then be constructed for the pumping station building, ESB substation, standby generator, surge vessels and associated external plant. Underground services, drainage, ducting, chambers and below-ground pipework will be installed in parallel with the civil works, including connections to the incoming and outgoing treated water pipelines.

Superstructure works will include construction of the pumping station building, including the pumping area, control room, welfare facilities and provision for overhead lifting equipment. The ESB substation, standby generator base, surge vessel bases and associated external infrastructure will also be constructed. Construction and commissioning of the ESB substation will be undertaken by ESB Networks or its appointed contractors, as appropriate.

Mechanical, electrical, instrumentation, control and automation works will include installation of pumps, surge vessels, process pipework, valves, flow and pressure instrumentation, control panels, telemetry, standby generator connection and associated cabling and ducting. Roof-mounted solar PV panels will also be installed on the pumping station building, where practicable, following completion of the main roof and electrical works.

Noise and vibration during construction will be managed in accordance with the CEMP (see Section 3.3.4.1) and the noise and vibration mitigation measures set out in Chapter 13 – Noise and Vibration of this EIAR. Temporary acoustic screening or acoustic blankets may be installed where required, subject to the final construction methodology, equipment selection and the proximity of works to sensitive receptors.

Ancillary works will include construction of permanent access arrangements, site drainage, security fencing, gates, lighting, hardstanding and external pipework. Landscaping and biodiversity enhancement measures will be implemented following completion of the principal construction works, in accordance with the landscape and biodiversity proposals included in this EIAR.

Following completion of construction, the Bonniconlon BPS will be tested and commissioned. Commissioning will include mechanical and electrical testing, pressure testing, functional testing of pumps and surge vessels, telemetry and control system integration, standby generator testing, verification of alarms and interlocks, and integration with the upstream and downstream treated water network. Final commissioning and transfer to operational service will be coordinated with commissioning of the wider scheme.

The works at Bonniconlon BPS are anticipated to take approx. six months to complete. The works may be undertaken in stages and are not necessarily sequential, subject to programme, construction logistics, commissioning requirements and coordination with other elements of the Proposed Development.

3.2.6.3 Operation and Maintenance

The proposed Bonniconlon BPS will operate as an integral component of the treated water transfer system between Lisglennon WTP, Windy Gap BPT and Lough Talt WTP. The BPS is anticipated to operate for up to approximately 22 hours per day, subject to demand, network conditions and operational requirements.

Operation of the BPS will be automated through the site control system, with pump operation managed through a duty / assist / standby (four pumps in total) arrangement. The control system will manage pump start-up, shutdown and duty changeover, and will be integrated with telemetry / SCADA to support remote monitoring and operational control. Flow, pressure, pump status, alarms and other key operational parameters will be monitored to support system performance, operational resilience and continuity of supply.

The surge vessels will form part of the hydraulic protection system for the treated water transfer main. They will be operated and maintained to manage transient pressures arising from pump start-up, shutdown, power failure or other operational events, thereby reducing the risk of adverse pressure surges within the pipeline system.

Routine operation and maintenance will include operator attendance, visual inspections, functional checks and planned preventative maintenance of civil, mechanical, electrical, instrumentation, control and automation assets. This will include pumps, valves, surge vessels, pipework, flow and pressure instrumentation, control panels, telemetry equipment, standby generator, solar PV infrastructure, electrical systems, drainage, access road, hardstanding, fencing, gates, lighting and site security systems.

The standby generator and associated fuel storage will be inspected, tested and maintained as part of the planned preventative maintenance regime to confirm readiness for use during power outages or other operational contingencies. The ESB substation will be operated and maintained by ESB Networks or its appointed contractors, as appropriate. The solar PV system will be monitored and maintained to support site energy efficiency, subject to operational requirements.

Operational access to the site will be via the new access from the L5135. Routine operational traffic will generally comprise operator visits, maintenance vehicles, inspection visits and occasional specialist contractor attendance. Additional visits may be required for generator testing, equipment servicing, solar PV maintenance, landscaping maintenance or response to operational alarms.

Welfare facilities and foul drainage infrastructure at the BPS will be operated and maintained in accordance with Uisce Éireann requirements and relevant environmental controls. Surface water drainage infrastructure, including gullies, drains, petrol interceptor and attenuation / infiltration features, will be inspected and maintained to ensure continued performance.

Operation and maintenance will be undertaken in accordance with Uisce Éireann operational procedures, including procedures for abnormal operating conditions.

3.2.7 Windy Gap Break Pressure Tank (BPT)

3.2.7.1 Windy Gap BPT Site

The proposed site is located in the vicinity of the Bunnyconnellan Wind Farm granted planning permission in 2013 under Planning Application Ref. 10/514 and Appeal Ref. PL16.241506, and which comprises 12 2.3 MW wind turbines. The proposed site utilises the existing access road of the wind farm.

The site is located off the R294 which connects Bonniconlon to the west with Lough Talt to the east. The wider area is rural in nature, comprising of areas of heavy overgrowth and areas of bogland. The topography of the area varies across the landscape significantly, the areas to the north of the site are generally flat, with the landscape rising to a peak to the south of the site along the Mayo and Sligo border. The site itself is located above the level of the road (Figure 3-25). It is accessed via a private road / commonage which also provides vehicular access to the wind farm. The access road to the site is gated (Figure 3-24).



Figure 3-24 — Site at Windy Gap



Figure 3-25 — Access / Commonage to Site at Windy Gap

Proposed BPT is required to provide operational and transient suppression benefits (i.e. to regulate water pressure) and serve as a storage tank for the Lough Talt network. Water pressure regulation prevents surges which can result in damage to the network (e.g. a burst pipeline) by creating a hydraulic break between pumped water and conveyance under gravity. The location is driven by the hydraulic requirement to be located at or beyond the highest point of the pumped section of the treated water pipeline.

A proposed site layout is shown in Figure 3-26. The Proposed Development will consist of:

- A new BPT with a storage capacity of approx. 80 m^3 (Ref No. 1, Figure 3-26);
- A new scour extraction kiosk and a new control kiosk (Ref Nos. 5 and 6, Figure 3-26);
- Associated inlet pipe (Pipeline D), outlet pipe (Pipeline E), overflow pipe and scour line;
- A new Precast Cement Concrete inspection/collection chamber approx. 900 mm diameter (Ref No. 4, Figure 3-26);
- Associated works including underground flowmeter chambers (Ref No. 3, Figure 3-26), valve chambers, pipework; and,
- Ancillary site development works, including access arrangements, hardstanding, surface water management, site lighting, fencing, security and landscaping.

A typical 3D view of the proposed BPT site is shown in Figure 3-27.



Figure 3-26 — Proposed BPT at Windy Gap Break Pressure Tank Layout

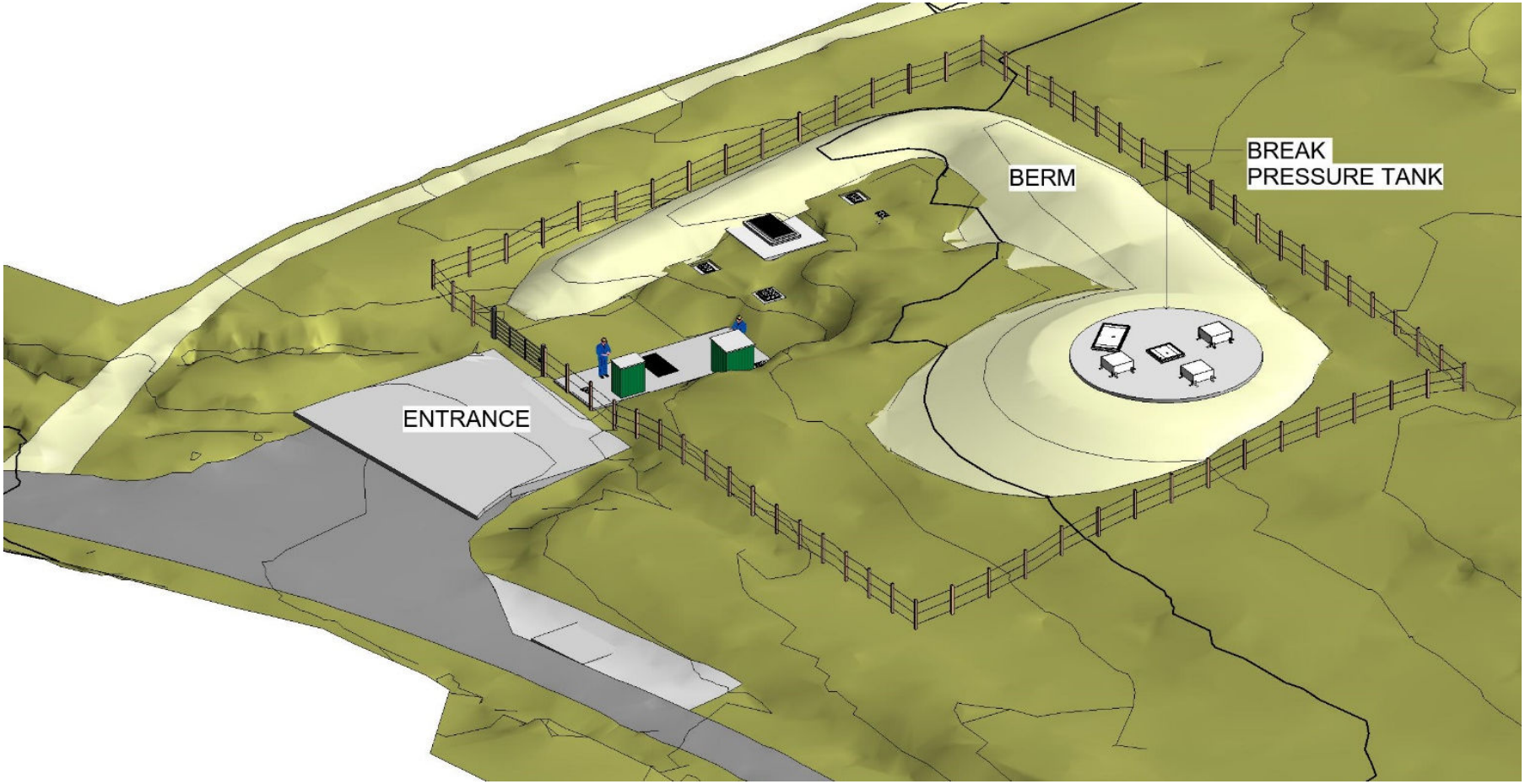


Figure 3-27 — Proposed BPT at Windy Gap – A typical 3D view

The proposed BPT at Windy Gap, Ballina, Co. Mayo (Ref No. 1, Figure 3-26), will provide a storage volume of approximately 80 m³. The internal dimensions of the proposed tank will be approximately 7.5 m diameter and 2.3 m depth, including freeboard. The BPT site will include inlet (green, Figure 3-26) and outlet pipework (dark blue, Figure 3-26), overflow pipework (light blue, Figure 3-26) and a scour line (magenta, Figure 3-26). The inlet pipe from Pipeline D (green, Figure 3-26) connects into the proposed BPT and the outlet pipework will connect to the Pipeline E (dark blue, Figure 3-26) which conveys treated water flows to Lough Talt WTP. The high-level overflow pipe (light blue, Figure 3-26) will be connected to the treated water network and overflows will be directed back into the network via proposed Pipeline E (dark blue, Figure 3-26). The scour line (magenta, Figure 3-26) will connect to a scour extraction point fitted with a Bauer-type tanker connection, housed within a dedicated scour extraction kiosk (Ref. No. 5, Figure 3-26). Ancillary hydraulic and control infrastructure will include underground flowmeter chambers (Ref. No. 3, Figure 3-26), valve chambers, associated pipework, a scour extraction kiosk (Ref. No. 5, Figure 3-26) and a control kiosk (Ref. No. 6, Figure 3-26).

3.2.7.1.1 Habitat-specific design considerations

The proposed BPT is located in bogland. Bog is acidic, therefore proposed mitigation measures include using specific concrete mix that is robust to construction. To manage and monitor any leaks, an impermeable membrane will be installed within the pipe surround / pipe bedding, within the trenches of all underground pipelines within the site. A geomembrane or liner wrapped approx. 80 mm diameter perforated drains will be installed within the pipe surround / pipe bedding to collect any leaks from the underground treated water pipelines. These perforated drains will collect any leaks and convey into a 900 mm diameter Precast Cement Concrete inspection/collection chamber. The operations personnel will inspect the chamber periodically for any leaks and any collected treated water will be disposed of appropriately.

The BPT will be a precast concrete tank and will be installed by standard methods. The BPT will have appropriate protective / resistant coatings suitable for the bog ground.

3.2.7.1.2 Power Supply

A new ESB connection will be required at this site to power instruments, telemetry outstation and site lighting, which is subject to an application submitted to the ESB, via overhead line. It is anticipated that ESB will provide connection via the existing MV Overhead lines to the west of the site subject to detail design and further engagement with ESB.

3.2.7.1.3 Ancillary works

Access

Access to the site will be via an existing access road / commonage off the regional road R294 which leads to the Bunneyconnellan Wind Farm, south of the proposed BPT. The distance between the site and the regional road R294 is approximately 260 m. The existing access road will not require upgrading. An existing lay-by located in front of the site will be upgraded using asphalt to accommodate vehicles during construction, operation and maintenance.

Fencing / Boundary

A new post and wire fence (approx. 1.2 m in height) is proposed around the site (orange line, Figure 3-26). A farm gate is proposed at the entrance to the site. There will be no security fencing. Minimum physical site security will be provided due to the sensitive landscape. A 1.2 m high stock fence and a pedestrian gate will be provided in accordance with TEC-600-01 to keep livestock from entering the site.

Stormwater Management

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 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.

Site Lighting
Low level bollard will be provided on the plinth to allow for a safe access to kiosks. Internal ceiling mounted luminaire will be provided in the kiosk. Refer to Section 3.8 for overall site lighting for the Proposed Development.

Landscaping
Given the high landscape sensitivity of the area, the proposed BPT will be entirely below ground with a gradual embankment built up around the tank. Excavated materials will be salvaged for re-instatement in order to offset potential visual and ecological constraints. Every effort will be made to create berm screening from bog material excavated from the site (Ref. No. 2, Figure 3-26). Proposed landscaping is shown in Drawing 10025936-ATK-T1-ZZ-DR-CE-211723 (Appendix 3-1 of Volume 3 of the EIAR).

3.2.7.2 Construction

The construction works at Windy Gap BPT will comprise the installation of a new below-ground precast concrete break pressure tank, associated inlet, outlet, overflow and scour pipework, flowmeter and valve chambers, precast cement concrete inspection / collection chamber, scour extraction kiosk, control kiosk, power and telemetry connections, access and hardstanding improvements, fencing, landscaping and habitat reinstatement. The final construction methodology, phasing and temporary works arrangements will be confirmed by the Appointed Contractor during detailed design and construction planning. Any refinements will remain within the project description, design parameters and environmental assessments in this EIAR and will be implemented in accordance with the CEMP, CRWMP and other relevant construction management plans (see Section 3.3.4).

Site access will be via the existing Bunnyconnellan Wind Farm access road from the R294. Construction traffic will use the existing gated wind farm access route, subject to appropriate access arrangements and coordination with the wind farm operator. Temporary traffic management measures will be implemented where required in accordance with the Construction Traffic Management Plan (Section 3.3.4.2) and in consultation with the relevant roads authority.

Initial works will include site establishment, demarcation of the works area, installation of temporary working areas, protection of sensitive habitats, confirmation of existing services and drainage, and site preparation. The limits of construction activity will be clearly defined before works commence. Plant movements and material storage will be confined to designated working areas to minimise disturbance to the surrounding bog habitat.

Based on current ground investigation information, the ground conditions at the Windy Gap BPT site comprise shallow peat, anticipated to be approx.. 0.5 m in depth, overlying silty sand / gravel. Excavation will be required to install the below-ground BPT, associated chambers, pipework and kiosks. The main excavation for the BPT is anticipated to extend to approx. 3 m bgl, subject to detailed design and confirmatory ground conditions. Excavations for pipework, chambers, ducting and kiosk foundations will be shallower and will vary locally depending on final layout, cover requirements and ground conditions (see Section 3.6).

Peat and underlying mineral soils will be stripped and stored separately within designated areas. Peat turves and surface vegetation will be lifted intact where practicable and retained for reinstatement. Peat will be stored in a manner that maintains moisture content and preserves its suitability for re-use in habitat reinstatement. Excavated material will be managed in accordance with the CRWMP (Section 3.3.4.5). Suitable excavated material, including peat and mineral soils, will be re-used on site where practicable for backfilling, grading, formation of the landscaped embankment and habitat reinstatement. Surplus or unsuitable material will be

removed from site and transported to an appropriately authorised facility for recovery, treatment or disposal, as appropriate.

The BPT excavation will be formed to the required depth and founding level. Localised temporary works, such as trench support, battering of excavation sides or other stabilisation measures, will be used where required to maintain safe working conditions and protect adjacent peat and ground stability. Deep or perimeter dewatering is not anticipated. Where localised water ingress occurs, sump pumping may be used on a limited basis. Any pumped water will be managed through appropriate silt control measures before discharge or infiltration, in accordance with the CEMP and relevant environmental controls (see Section 3.3.4).

The BPT will be constructed as a precast concrete structure or equivalent tank system suitable for the ground conditions and operational requirements. The tank will be designed and constructed to account for potentially acidic ground and groundwater conditions associated with the bog environment. An impermeable geomembrane or liner will be installed on the tank surface approx. 500 mm below the finished level to allow surface runoff percolation away from the tank The associated below-ground pipework will be provided with the specified impermeable membrane, leak collection and inspection arrangements, including wrapped perforated drains and an inspection / collection chamber, where required by the final design. These measures will allow treated water leakage, if any, to be directed to a defined inspection point for monitoring and management.

The inlet, outlet, overflow and scour pipework will be installed in excavated trenches between the BPT and the site boundary / connection points. Pipework trenches will be backfilled using suitable material and reinstated to avoid the creation of preferential drainage pathways through the bog. Impermeable wraps or equivalent hydraulic control measures will be installed where required to maintain existing hydrological conditions and prevent preferential flow paths along pipe trenches. Flowmeter chambers, valve chambers, the inspection / collection chamber and associated ducting will be installed in parallel with the pipework works.

Foundations or concrete plinths will be constructed for the scour extraction kiosk and control kiosk. Electrical ducting and control / telemetry connections will be installed between the chambers, kiosks and power connection point. A new ESB connection will be provided to serve instrumentation, telemetry and lighting, subject to ESB Networks requirements. Works associated with the ESB connection will be undertaken in accordance with the requirements of ESB Networks and the relevant construction management controls.

Construction within the bog habitat will be undertaken using appropriate low-impact methods. Bog mats, temporary ground protection and low-ground-pressure plant will be used where practicable to reduce rutting, compaction and disturbance. Plant and materials will be stored only within designated areas. Fuels, oils, cementitious materials, concrete washout, chemicals and other potentially polluting materials will be managed in accordance with the pollution prevention measures set out in the CEMP (Section 3.3.4.1). Concrete washout will not be permitted on unprotected ground.

Site-specific ecological supervision will be provided where required by the CEMP and biodiversity mitigation measures (see Section 3.3.4). A suitably qualified ECoW will oversee sensitive works, including peat stripping, habitat protection, reinstatement and any works with potential to affect bog hydrology or ecological receptors. The Appointed Contractor will implement measures to prevent sediment runoff, uncontrolled drainage, fuel or chemical spillages, and damage to retained bog habitat.

Following completion of the structural, pipework, kiosk, power and telemetry works, the BPT and associated infrastructure will be tested and commissioned. Commissioning will include hydraulic testing, pressure testing where applicable, verification of flowmeter and valve operation, telemetry and alarm testing, scour extraction arrangements and confirmation that the BPT can operate as part of the treated water transfer system between Bonniconlon BPS and Lough Talt WTP.

On completion of the construction works, temporary working areas will be removed and disturbed areas will be reinstated. The original peat and salvaged peat turves will be reinstated, where practicable, to match surrounding levels and support natural recolonisation by bog vegetation. Reinstated peat surfaces will be lightly consolidated and wetted where required to support vegetation recovery. Temporary drains or channels created during construction will be backfilled or blocked as appropriate to restore existing hydrological conditions and avoid long-term drainage effects. Landscaping and habitat reinstatement measures will be implemented in accordance with the CEMP, CRWMP and the landscaping and biodiversity proposals included in this EIAR (see Section 3.3.4) and the NIS.

The works at Windy Gap BPT are anticipated to take approximately eight months to complete, subject to weather, ground conditions, ecological constraints, construction logistics and commissioning requirements. The works may be undertaken in stages and are not necessarily sequential. Construction and commissioning of the Windy Gap BPT will be required before the cessation of abstraction from Lough Talt and before works at Lough Talt WTP that are dependent on the availability of the proposed treated water transfer system.

3.2.7.3 Operation and Maintenance

The Windy Gap BPT will operate as a break pressure and hydraulic control asset within the treated water transfer system between Bonniconlon BPS and Lough Talt WTP. The BPT will operate continuously while the treated water transfer system is in service, with inflow and outflow governed by the upstream pumping regime, downstream hydraulic conditions and operational requirements.

Monitoring of the BPT will be provided through flow, level and pressure instrumentation connected to the site control and telemetry systems. The control and telemetry systems will support remote monitoring of tank levels, flow rates, valve status, alarms and abnormal operating conditions. The BPT will form part of the wider treated water network control strategy and will support continuity of supply to the Lough Talt supply area.

Routine operation and maintenance will include operator attendance, visual inspections, functional checks and planned preventative maintenance of the BPT, inlet and outlet pipework, overflow and scour arrangements, flowmeter chamber, valve chambers, inspection / collection chamber, scour extraction kiosk, control kiosk, telemetry equipment, power supply, fencing, access arrangements and hardstanding.

The scour arrangement will be maintained to allow controlled removal of settled material and drainage of the BPT where required for inspection, cleaning or maintenance. Scour activities will be undertaken in accordance with Uisce Éireann operational procedures and the scour management proposals set out in Section 3.9. Scoured water will be removed from site by tanker or otherwise managed in accordance with the approved operational procedure and relevant environmental controls.

The inspection / collection chamber associated with the impermeable envelope and wrapped perforated drainage system will be inspected periodically to monitor for any leakage from the BPT or associated below-ground pipework. Any water collected within the inspection / collection chamber will be managed in accordance with Uisce Éireann operational procedures and environmental requirements.

Given the bog habitat setting, operational maintenance will also include inspection of reinstated peat surfaces, local ground conditions, access arrangements and any areas where settlement, erosion, rutting, compaction, ponding or preferential drainage could occur. Any remedial works will be undertaken in a manner that maintains the surrounding bog hydrology and avoids unnecessary disturbance to retained peat and vegetation.

No permanent welfare facilities or foul drainage infrastructure are proposed at Windy Gap BPT. Operational access will be via the existing Bunnyconnellan Wind Farm access road from the R294. Routine operational traffic is expected to be limited and will generally comprise operator inspections, maintenance visits, specialist contractor attendance and tanker access where required for scour extraction or maintenance activities.

3.2.8 Lough Talt WTP

3.2.8.1 Existing Lough Talt WTP Site

The site comprises the existing Lough Talt Water Treatment Plant (WTP) which consists of a Control building, a disused Microstrainer building, chemical storage tanks, Chlorine contact tank and other associated process units and infrastructure.

The site is accessed via a shared vehicular entrance on the east of the site, which also provides access to the Coillte lands to north (Figure 3-28). There is an existing gated access to the south of the site boundary however, this is no longer in use. The site runs parallel to the R294 which bounds the site to the south. The site is separated from the roadway by an approx. 2 m high wire fence which runs along the perimeter of the entire WTP site. The overall site is topographically flat in nature, however the site sits above the level of the road, with the site falling towards the road along the boundary (Figure 3-29). The lands to the north of the site rise north along the ridge line which travels northeast. The site is located approx. 250 m southeast of Lough Talt.



Figure 3-28 — Existing Lough Talt WTP site (from entrance)



Figure 3-29 — Existing Lough Talt WTP site

No works are proposed to the existing abstraction point from Lough Talt, which is not located within the Lough Talt WTP site or the Red Line Boundary. The cessation of abstraction from Lough Talt will be achieved by closing a control valve within the abstraction arrangement located adjacent to the carpark at Lough Talt.

The existing layout at Lough Talt WTP site is shown in Figure 3-30 and comprises the following:

- Control Building;
- Microstrainer Building – disused;
- Rapid Gravity Filtration units, backwash holding tank, pumps and associated works;
- Raw Water Feed Container, Raw Water Balance Tank and associated works;
- Containerised UV unit and associated works;
- Chemical storage container, tanks and associated works;
- Chlorine Contact Tank;
- Disinfection (chlorination and ammonia) and orthophosphate dosing units and associated works;
- Used Wash Water Equalisation Settlement Tank (UWWEST), Settlement tanks, Sludge holding tank and associated works; and,
- Attenuation Pond.

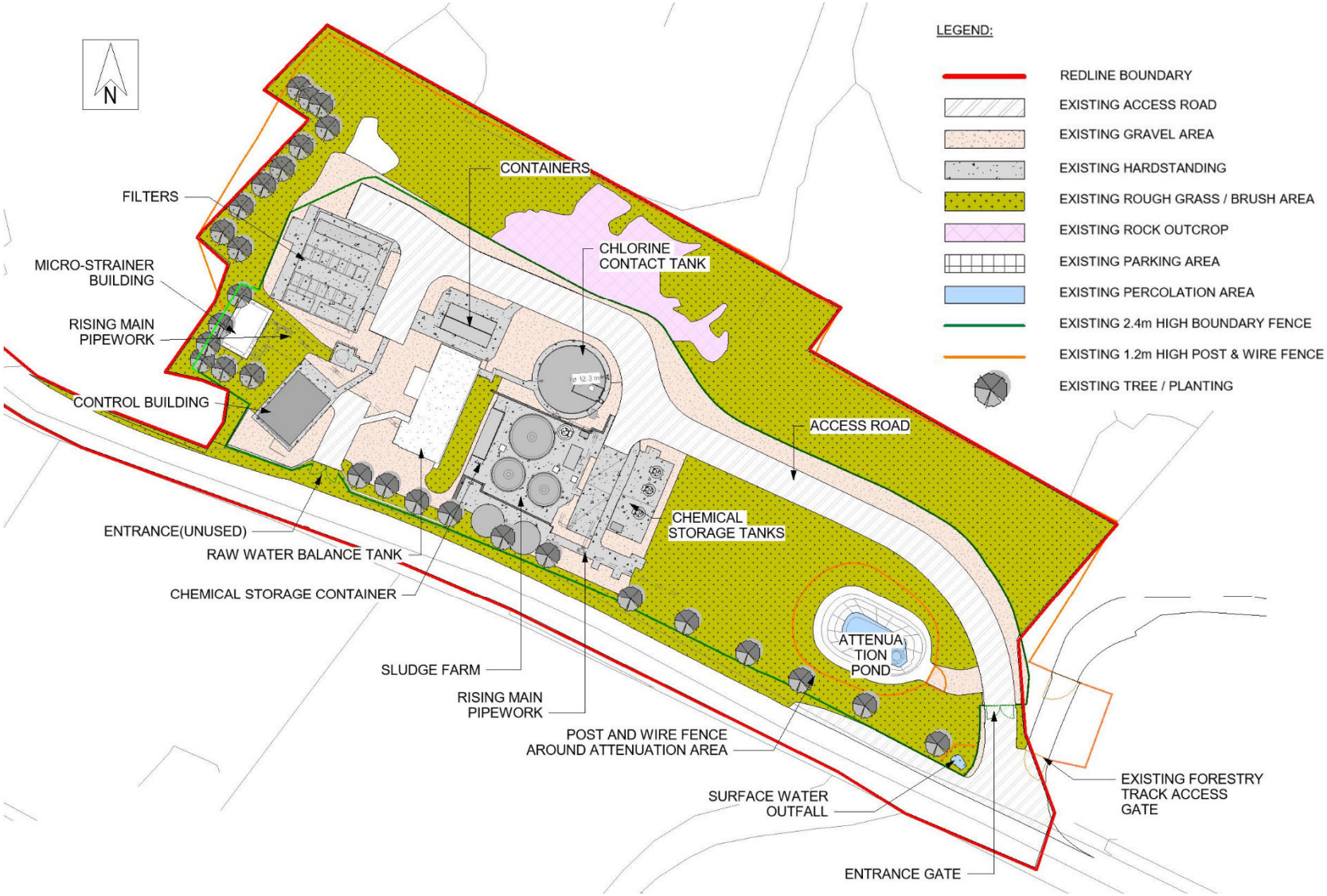


Figure 3-30 — Existing Layout at Lough Talt WTP site

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3.2.8.2 Proposed Repurposing of Lough Talt WTP

The existing Lough Talt site will be repurposed as part of the Proposed Development. The existing storage at Lough Talt WTP is limited and hence a new treated water reservoir with increased storage is required to improve water security and water quality for the Lough Talt RWSS area.

3.2.8.2.1 New and repurposed infrastructure

As part of repurposing of Lough Talt WTP, new infrastructure, repurposing of existing infrastructure (Figure 3-31), retention of existing infrastructure, removal and decommissioning of existing redundant infrastructure (Figure 3-32) and ancillary works are proposed, as follows:

- New infrastructure:
  - A new treated water reservoir of approx. 3,300 m^3 capacity and associated works; and
  - Installation of roof mounted solar panels.
- Repurposed existing infrastructure:
  - Repurposing of existing approx. 330 m^3 chlorine contact tank as reservoir.
- Retained existing infrastructure:
  - Control building;
  - Chemical storage container, tanks and associated works; and
  - Disinfection (chlorination and ammonia) and orthophosphate dosing infrastructure.
- Ancillary site development works, including alterations to access road, hardstanding, surface water management, wastewater management, site lighting, fencing and landscaping.

3.2.8.2.2 Removal / demolition works

As part of site repurposing, the following existing infrastructure (items, surfaces) will be decommissioned, removed / demolished:

- Section of existing access road overlapping the footprint of the proposed new treated water storage tank;
- Containerised filtered water pumps (Ref. No. 1, Figure 3-32);
- Two filter banks (Ref. Nos. 2 and 3, Figure 3-32);
- Backwash holding tank (Ref. No. 4, Figure 3-32);
- Containerised backwash pumps (Ref. No. 5, Figure 3-32);
- Micro-strainer building (Ref. No. 6, Figure 3-32);
- Inlet valve chamber (Ref. No. 7, Figure 3-32);
- Three Kiosks (Ref. Nos. 8, 16 and 17, Figure 3-32);
- Chemical tank (Ref. No. 9, Figure 3-32);
- Containerised UV unit (Ref. No. 10, Figure 3-32);
- Raw water feed container (Ref. No. 11, Figure 3-32);
- Raw water balance tank (Ref. No. 12, Figure 3-32);
- UWWEST tank (Ref. No. 13, Figure 3-32);
- Settlement tank (Ref. No. 14, Figure 3-32);
- Sludge holding tank (Ref. No. 15, Figure 3-32);
- Associated works with removal and demolition of the above; and
- Existing fenceline (purple line, Figure 3-32).

These are shown in Figure 3-32.

Demolition waste material generated (approx. 375 m^3) at the Lough Talt WTP site will consist largely of concrete and block which can be recycled under an Article 28 application. The road surface (approx. 95 m^3) to be removed will be sent to a reclaimed asphalt pavement (RAP) plant for re-use, if suitable.

An asbestos survey was carried out by OHSS in March 2025 to provide sufficient information for designers and the project supervisor for design process to take account of identified asbestos risks. The report is given in Appendix 11- Asbestos Refurbishment Survey in the IDL Report in Appendix 9-1 Volume 3 of this EIAR. No asbestos containing materials (ACMs) were identified at the Lough Talt WTP. Nevertheless and as appropriate, the Appointed Contractor will conduct an asbestos survey to guide site clearance and ensure safe removal of asbestos before any construction or demolition begins. Waste generated during construction of the Proposed Development is assessed in Chapter 14 – Resource and Waste Management. It is estimated that 1,200 tonnes of concrete waste will be generated from demolition work, reservoir construction, foundations etc. Suitable demolition concrete will be removed from site by a licenced contractor and transferred to a facility for recovery if the end of waste criteria are met. This will be done under an Article 28.

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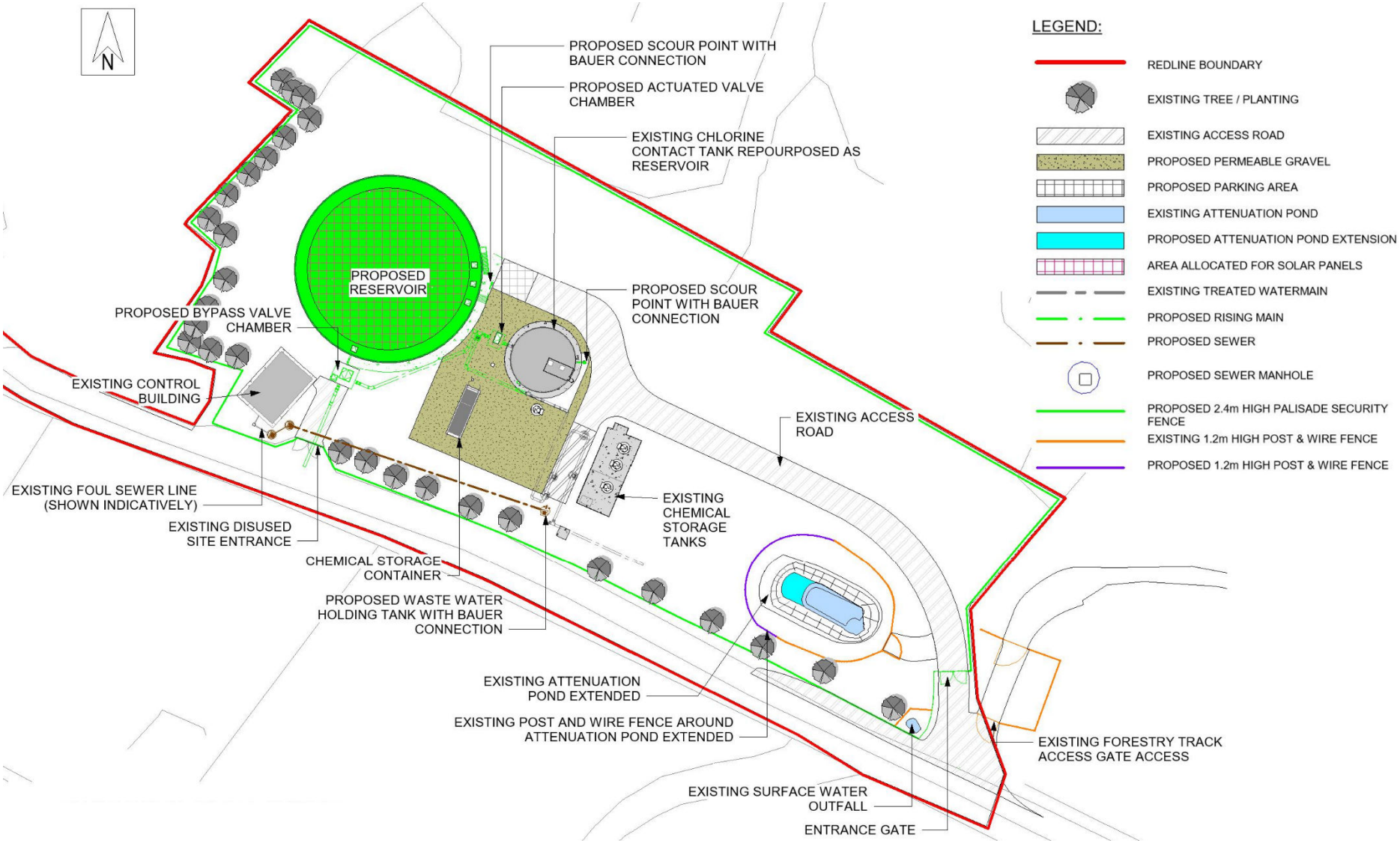


Figure 3-31 — Proposed Layout at Lough Talt WTP

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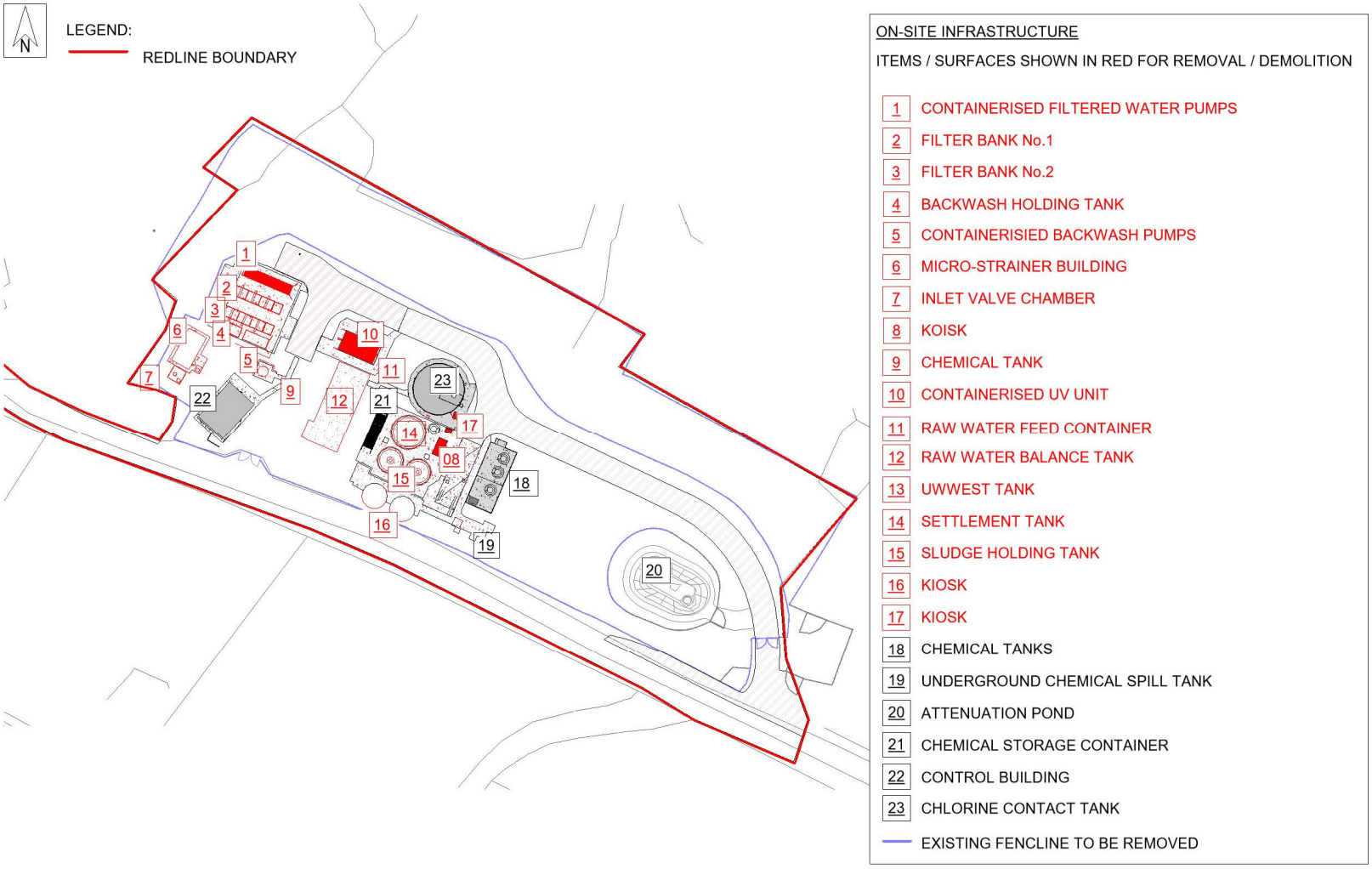


Figure 3-32 — Proposed Layout showing removal and decommissioning of existing redundant infrastructure at Lough Talt WTP

The new treated water reservoir will be located westwards away from the mountains as far as possible to minimise excavation in mountains. The reservoir will be above ground as site investigation results indicated the presence of shallow bedrock in the area. The top of the tank will be 133 m OD. The Pipeline E will be connected into this reservoir with a new bypass arrangement to the repurposed chlorine contact tank. There will be a direct underground pipework from new treated water reservoir to the repurposed chlorine contact tank. A new scour point with Bauer connection will be provided at both the new reservoir and repurposed tank. The existing outlet pipeline from the repurposed chlorine contact is deemed sufficient to supply to the Lough Talt RWSS.

Upon commissioning of the Proposed Development, abstraction from Lough Talt will cease and Lough Talt WTP will receive treated water from Pipeline E. The relevant existing water treatment facilities will be retained and dosing will be adjusted as necessary to account for the new supply.

3.2.8.2.3 Power supply and Renewable Energy

The existing power supply is deemed sufficient for the proposed works at the site and hence no alterations to existing power supply is envisaged.

Solar panels will be installed on the roof of the new storage tank to supplement the power requirements of the site. Additional details are provided in Section 3.5.

3.2.8.2.4 Ancillary Works

Access Road

The existing access road will be retained, except for a small area to the western end of the site where it overlaps with the footprint of the new storage tank – this section will be demolished. A new asphalt road with an area of approx. 80 m^2 will be provided around the existing chlorine contact tank to facilitate vehicle manoeuvring. Hardstanding will be provided at the eastern side of the new treated water reservoir.

The only access to site is via the existing access road on the eastern side of the Lough Talt WTP site. The access via the south western entrance is no longer used.

Fencing

New 2.4 m high palisade security fencing will be installed all around the site. The existing 1.8 m high post and wire mesh fencing will be removed.

Stormwater Management

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 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 a pre-determined level. The existing attenuation pond is sized to cater for extreme rainfall events.

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.

Wastewater management

An existing septic tank is located near the south-western end of the site. 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.

Site Lighting
Low level bollards will be installed along the access road and paths to allow for a safe access to site. Wall mounted luminaires will be installed on the tank to light the plinth.

Landscaping
This site will likely need input of additional soil excavated from elsewhere on the Proposed Development due to poor local soil quality.

Approximately 120 m of hedgerow will be provided along the fence on southern boundary of the site. Areas where tanks and hard surfaces have been removed will be sowed as grassland area and managed with a reduced mowing regime.

The Lough Talt WTP site will be planted with woodland mix where possible. This includes around new and retained tanks, as well as around the attenuation pond.

Additional hedging with standard trees will be planted at the entrance road (avoiding buried pipes), to the southeast and to the west of the expanded attenuation pond. Proposed landscaping is shown in Drawing 10025936-ATK-T2-ZZ-DR-CE-211723 (Appendix 3-1 of Volume 3 of the EIAR).

3.2.8.3 Construction and Demolition Works

The existing Lough Talt abstraction and treatment system currently supplies potable water to the Lough Talt RWSS. The main reconfiguration works at Lough Talt WTP will therefore be planned and sequenced to maintain continuity of supply to the Lough Talt supply area. Works that are dependent on the availability of the proposed treated water transfer system will not be undertaken until the upstream scheme elements, including Lisglennon RWS&PS, Lisglennon WTP, Bonniconlon BPS, Windy Gap BPT and Pipelines A to E, have been constructed, tested and are available for commissioning. Limited enabling works may be undertaken in advance where they do not compromise the continued operation of the existing Lough Talt abstraction and treatment system.

The construction works at Lough Talt WTP will comprise the reconfiguration of the existing WTP site to operate as a treated water storage and conditioning facility following cessation of abstraction from Lough Talt. The works will include connection of Pipeline E to the new reservoir and the repurposed chlorine contact tank, retained site infrastructure, construction of a new treated water storage tank, repurposing of retained treatment assets, decommissioning and removal of redundant process equipment, alterations to access roads and site drainage, site lighting, wastewater management and implementation of landscaping and biodiversity enhancement measures.

The final construction methodology, phasing, temporary works arrangements and commissioning sequence will be confirmed by the Appointed Contractor during detailed design and construction planning and will be implemented in accordance with the relevant construction management plans (see Section 3.3.4).

Initial activities will include site establishment, set-up of temporary working areas, confirmation and protection of existing operational assets, buried services, access routes and drainage infrastructure, and implementation of temporary traffic management measures where required. Retained operational infrastructure, including the existing chlorine contact tank, chemical dosing systems, site control systems, power supply, drainage systems and access arrangements, will be identified and protected prior to intrusive works.

Following availability of the proposed treated water transfer system, Pipeline E will be connected to the retained Lough Talt WTP infrastructure. The existing chlorine contact tank will be retained and repurposed as part of the

treated water storage and conditioning arrangement. Treated water received from the new supply will be introduced in a controlled manner, with associated pipework, valving, instrumentation and control systems tested and commissioned. Chemical dosing systems retained at the site, including chlorination, ammonia dosing, orthophosphate dosing and pH correction, will be adjusted as required to suit the incoming treated water quality and operational requirements.

The cessation of abstraction from Lough Talt will be coordinated with commissioning of the proposed treated water transfer system and confirmation that the retained Lough Talt WTP infrastructure can operate as part of the new supply arrangement. Once the supply switchover has been completed, redundant raw water abstraction and treatment processes will be isolated, drained, decommissioned and made safe in accordance with the decommissioning strategy and relevant Uisce Éireann operational procedures.

The section of existing access road that overlaps with the footprint of the proposed new treated water storage tank will be removed. Demolition and removal works will be undertaken in a controlled manner using suitable mechanical plant and hand tools where required. Materials generated during demolition will be segregated, tested where necessary, and managed in accordance with the CRWMP. Reusable or recyclable materials will be recovered where practicable, and any surplus or unsuitable material will be transported to an appropriately authorised facility for recovery, treatment or disposal.

Redundant treatment process units and associated mechanical, electrical, instrumentation, control and automation equipment will be isolated, made safe and removed where required. Existing assets to be retained will be protected throughout the works. Temporary isolations, tie-ins and modifications to live systems will be planned in advance and undertaken in accordance with method statements, risk assessments, isolation procedures and commissioning plans agreed with Uisce Éireann Operations.

Excavations at the Lough Talt WTP site are anticipated to be limited due to the presence of shallow bedrock, as identified in the ground investigation information presented in Appendix 9-1, Volume 3 of the EIAR. The new treated water storage tank will be constructed predominantly above ground on prepared foundations. Excavation will be required locally for foundations, pipework, chambers, drainage alterations, ducting and road reinstatement. Excavated material will be managed in accordance with the CRWMP, with suitable material re-used on site where practicable for backfilling, grading and landscaping, subject to geotechnical suitability and environmental testing.

The new treated water storage tank will be constructed as a reinforced concrete tank, precast tank system or equivalent structure suitable for the site conditions and operational requirements. Foundations will be formed to the required level, including blinding and reinforcement as required. The tank will then be constructed or assembled, with associated inlet, outlet, overflow, scour, washout, access, ventilation and inspection arrangements installed in accordance with the final detailed design.

Associated pipework and chambers will be installed to connect Pipeline E, the retained chlorine contact tank, the new treated water storage tank, chemical dosing systems and the downstream distribution network. Flowmeter chambers, valve chambers, scour arrangements, electrical ducting and control / telemetry interfaces will be installed as required. The works will be sequenced to allow the new and retained assets to be integrated into the revised hydraulic and operational arrangement while maintaining safe access and protecting retained infrastructure.

Alterations to the site access road, hardstanding, drainage network and attenuation pond will be undertaken as part of the civil works. The new asphalt access road around the retained chlorine contact tank will be constructed to facilitate operational access and vehicle manoeuvring. The existing drainage network will be modified where required to accommodate the new impermeable areas, with runoff conveyed through the proposed drainage system and attenuation measures. Surface water management measures during construction will be implemented in accordance with the CEMP (see Section 3.3.4.1) and final drainage design.

The existing wastewater arrangements will be modified as required to reflect the future operational use of the site. Wastewater flows from welfare facilities will be diverted to a new wastewater manhole or holding arrangement with tanker connection, where required by the final design. Any existing septic tank or redundant wastewater infrastructure affected by the works will be decommissioned or isolated in accordance with relevant environmental and health and safety requirements.

Where works require modification or relocation of existing utilities, including any ESB pole, stay or associated service, these works will be confirmed during detailed design and undertaken in consultation with the relevant utility provider. Such works will be planned to maintain safe working conditions and avoid unnecessary disruption to site operations or public infrastructure.

Following completion of structural, pipework, drainage, road, Mechanical, Electrical, Instrumentation, Control and Automation (MEICA) and utility works, the upgraded Lough Talt WTP site will be tested and commissioned. Commissioning will include hydraulic testing, pressure testing where applicable, disinfection, flushing, verification of tank levels and operational controls, flowmeter and valve testing, chemical dosing verification, telemetry and alarm testing, and confirmation that the site can operate as a treated water storage and conditioning facility within the wider supply system.

On completion of the principal works, temporary working areas, construction plant, temporary access arrangements and redundant temporary works will be removed. Disturbed areas will be reinstated, boundary features restored where practicable, and landscaping and biodiversity enhancement measures implemented in accordance with the CEMP, (see Section 3.3.4) and the landscaping and biodiversity proposals included in this EIAR.

The works at Lough Talt WTP are anticipated to take approximately two to three months to complete. The works may be undertaken in stages and are not necessarily sequential, subject to programme, commissioning requirements, continuity of supply constraints, construction logistics and coordination with other elements of the Proposed Development.

3.2.8.4 Operation and Maintenance

Following completion of the Proposed Development and cessation of abstraction from Lough Talt, the Lough Talt WTP site will operate as a WTP with increased treated water storage within the regional water supply network. Treated water will be supplied to the site via Pipeline E from the Windy Gap BPT and will be stored within the new treated water storage tank and repurposed chlorine contact tank prior to distribution to the Lough Talt supply area.

The site will provide treated water storage, operational balancing and final water quality conditioning. Operation will include management of storage levels, tank turnover, hydraulic conditions and water quality within the retained and new storage infrastructure. The retained chemical dosing systems, including chlorination, ammonia dosing, orthophosphate dosing and pH correction, will be adjusted and operated as required to maintain the required treated water quality, disinfectant residual and network stability.

Operation of the site will be supported by instrumentation, telemetry and remote monitoring. Key operational parameters, including storage levels, flows, dosing status, alarms and water quality monitoring points, will be monitored through the site control and telemetry systems and integrated into the wider network control strategy. Operator attendance will be provided as required for routine checks, sampling, inspection, maintenance, chemical management and response to operational alarms.

Routine operation and maintenance will include visual inspections, planned preventative maintenance and functional checks of the treated water storage tanks, retained chlorine contact tank / storage infrastructure, pipework, valves, flowmeters, chemical storage and dosing systems, control panels, instrumentation, telemetry

equipment, access arrangements, fencing, lighting, drainage infrastructure and site security systems. Maintenance will be undertaken in accordance with Uisce Éireann operational procedures, manufacturer requirements and relevant health, safety and environmental controls.

Chemical storage and dosing infrastructure will be inspected and maintained to confirm continued safe operation. This will include inspection of bunded areas, tanks, dosing pumps, pipework, transfer points, dosing lines, alarms and emergency response equipment. Chemical deliveries and storage will be managed in accordance with Uisce Éireann procedures and applicable environmental and health and safety requirements. The scour, overflow, washout and drainage arrangements associated with the treated water storage infrastructure will be inspected and maintained to allow controlled tank cleaning, inspection, maintenance and emergency drawdown where required. Water generated during operational maintenance, tank cleaning, flushing, scour or washout activities will be managed in accordance with Uisce Éireann operational procedures, the scour management proposals set out in Section 3.8 and relevant environmental controls.

Surface water drainage infrastructure, including gullies, pipework, manholes, flow control features and attenuation pond, will be inspected and maintained to ensure continued performance. Foul drainage infrastructure, including any retained or new wastewater holding / tanker connection arrangement, will be operated and maintained in accordance with Uisce Éireann requirements and relevant environmental controls.

Operational access will continue via the existing site entrance. Routine operational traffic will generally comprise operator visits, sampling and inspection visits, maintenance vehicles, chemical deliveries, specialist contractor attendance and tanker movements where required for wastewater or maintenance-related activities. The access road, hardstanding, fencing, lighting, landscaping and biodiversity enhancement areas will be maintained as part of routine site operations.

The Lough Talt WTP site will be operated as part of the wider treated water supply system to support continuity of supply, operational resilience, water quality compliance and long-term asset performance.

3.2.9 New Bonniconlon Reservoir

3.2.9.1 Existing site

The site is located off the L51172 at Bonniconlon West, in the vicinity of a junction with a private access road, west of the L5117. The surrounding area is predominantly rural and agricultural in character, with a number of residential properties located in the wider vicinity.

The existing Bonniconlon Reservoir (Figure 3-33) has a storage capacity of approximately 60 m³ and is supplied from the existing treated water network fed from Lisglennon WTP via Behy Road WPS and Rathreedane Pumping Station. An existing inlet pipe tees off the treated water main and discharges to an inlet chamber before entering the reservoir. Flow into the reservoir is controlled by a ball valve arrangement within the inlet chamber. The existing reservoir has a Top Water Level (TWL) of approximately 95.63 m OD. Treated water from the reservoir discharges back to the existing 225 mm watermain. An existing overflow pipe drains to a nearby field drain.

Bulk meters are provided on the inlet and outlet pipework within the existing reservoir site. An existing water quality sampling kiosk, including a sampling pump, is also provided and transmits chlorine residual and turbidity monitoring data to Lisglennon WTP through the existing monitoring and communications system. A site layout is shown in Figure 3.



Figure 3-33 — BonniconIon Reservoir – Existing Site

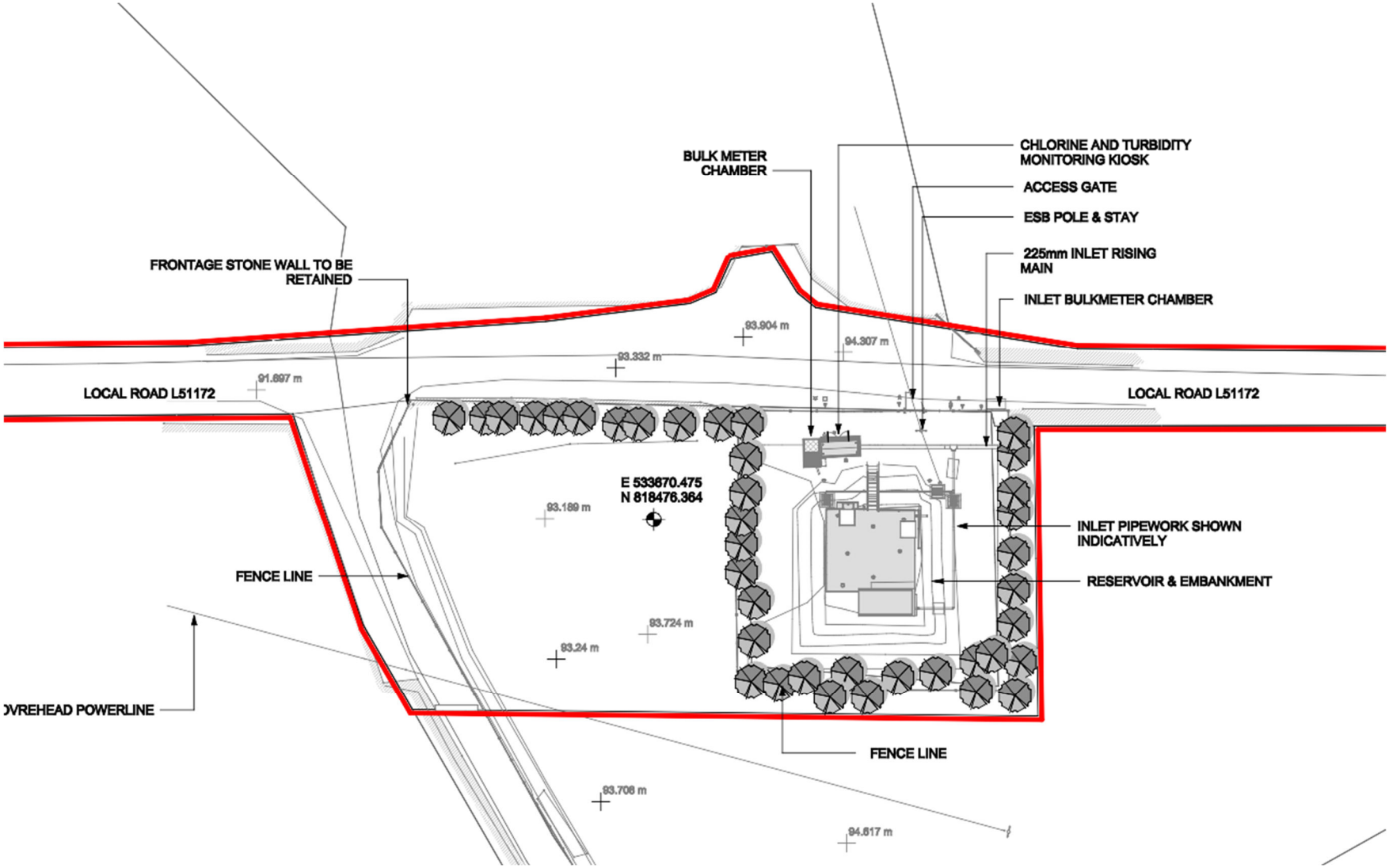


Figure 3-34 - Bonniconlon Reservoir Existing Site Layout

3.2.9.2 Proposed Reservoir

In order to improve the water security of the Bonniconlon area, a new reservoir is required. This reservoir will be fed by the existing network that supplies to Bonniconlon. While Pipeline D will be laid in the L51172 adjacent to the site, the new treated water pipeline will not supply this site.

The proposed works will consist of:

- A new reservoir approx. capacity of 185 m^3 and associated works;
- New dechlorination chamber;
- Relocation of ESB pole; and
- Ancillary site development works, including alterations to access arrangements, hardstanding, surface water management, site lighting, fencing, security, landscaping works.

A proposed site layout is shown in Figure 3-35, and a typical 3D view of the proposed upgrades are shown in Figure 3-36.

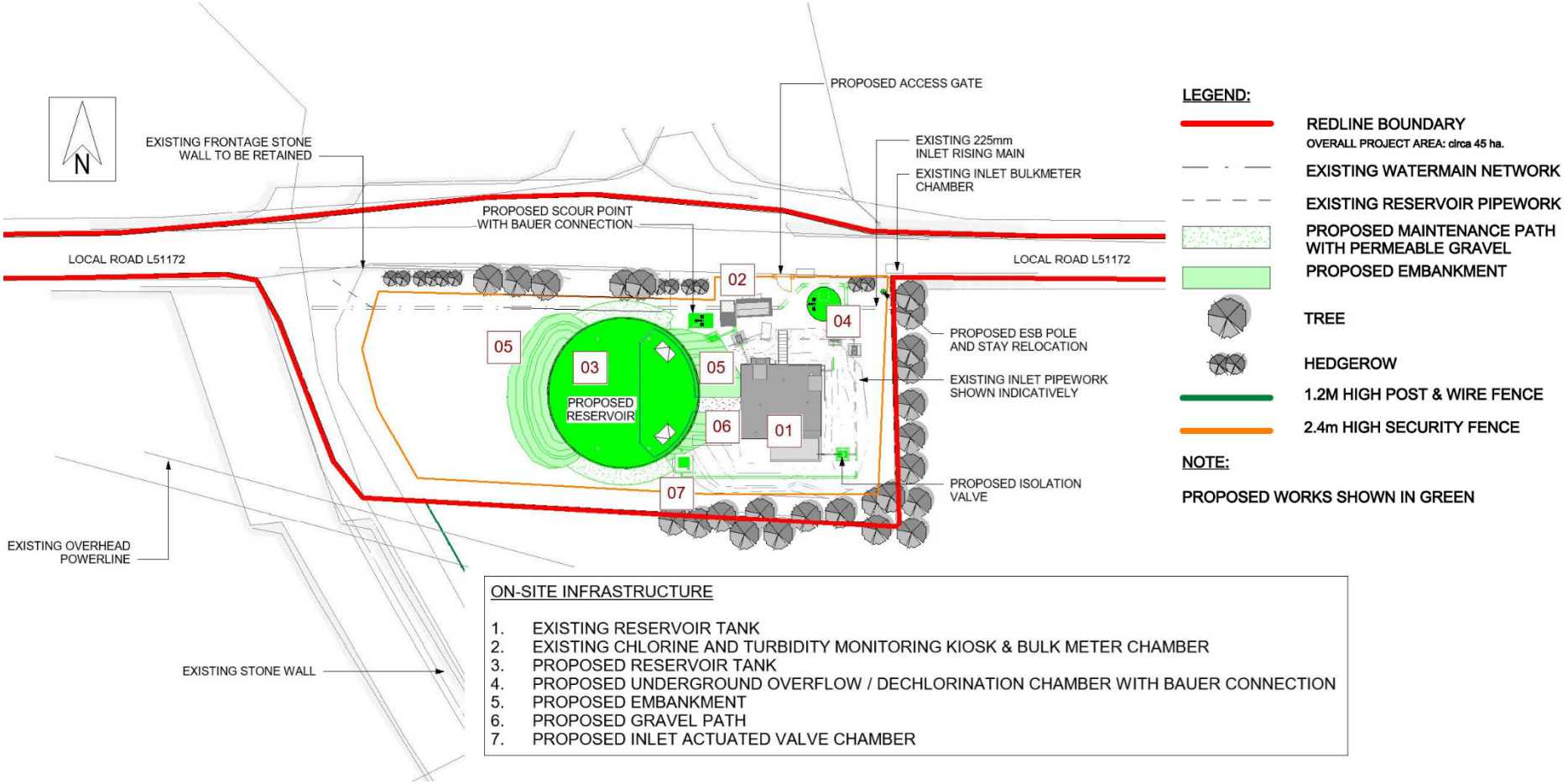


Figure 3-35 — Bonniconlon Reservoir Proposed Upgrades Site Layout

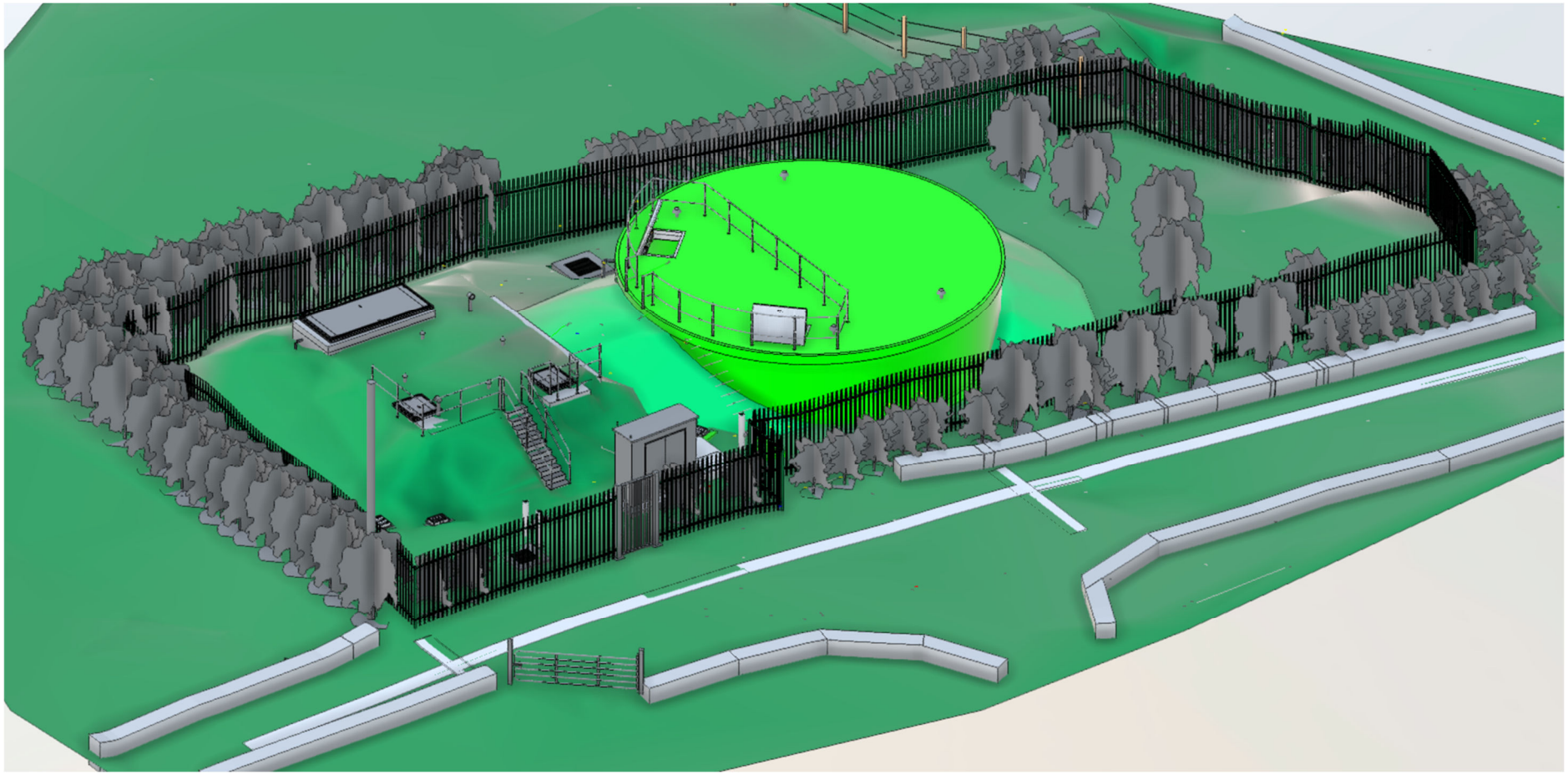


Figure 3-36 — BonniconIon Reservoir Proposed Upgrades – A Typical 3D view

The proposed treated water storage reservoir will have a working storage volume of approx. 185 m^3, with indicative dimensions of approx. 11 m diameter and 2.5 m height, including freeboard. It will operate in parallel with the existing treated water storage reservoir to provide a twin-cell storage arrangement, improving operational resilience, flexibility and security of supply.

The existing inlet main will be extended to serve the proposed reservoir. The inlet arrangement will be designed to support balanced flow distribution between the existing and proposed reservoir cells under normal operating conditions. The TWL of the proposed reservoir will be hydraulically matched to that of the existing reservoir, approximately 95.63 m OD, to support balanced filling and drawdown and to avoid preferential operation of either cell.

The proposed reservoir will be provided with a dedicated outlet pipe connecting to the existing outlet pipeline via the retained bulk meter chamber. An overflow level sensor will be installed within the proposed reservoir and connected to the existing monitoring and telemetry system. The inlet and outlet pipework will be configured to allow controlled drain-down, isolation and bypass of either reservoir cell for inspection, cleaning or maintenance, while maintaining supply through the other cell where practicable.

A new dechlorination chamber is proposed in the north-eastern part of the site and will connect to the existing reservoir overflow arrangement. The chamber will be accessible for routine inspection, emptying and maintenance, as required.

No upgrade to the existing power supply is proposed as it is anticipated to be sufficient to supply the proposed extension of the site. The existing ESB pole will be relocated to facilitate the installation of the dechlorination chamber.

3.2.9.2.1 Ancillary Works

Access Road and Pavement

Access and egress to site is through the L51172 local road. Temporary site access for construction will be required via the private lane to the southwest of the site. A gravel path for pedestrian access will be provided on the top of the berm between the reservoirs.

Fencing / Boundary

A new 1.2 m high post and wire mesh fence will be installed along the west boundary and a portion of the south boundary of the site. The existing 1.2 m high post and wire mesh will be joined to the new fence. The existing frontage wall will be retained. Stone ditch and corner ditch stone will be retained.

Stormwater Management

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.

Site Lighting

Low level bollards will be installed along the access path between the reservoirs to allow for a safe access to site. Internal ceiling mounted luminaire will be installed in the existing kiosk. Handrail linear luminaire will be installed to light the stairs leading to existing reservoir. Refer to Section 3.8 for overall site lighting for the Proposed Development.

Landscaping

The existing reservoir site is surrounded by mature trees while the adjacent greenfield site where the new reservoir will be located comprises of overgrown grassland.

Evergreen trees and/or shrubs native to the area will be instated as a hedgerow along the site boundary fence to screen off the site infrastructure. The hedgerow will be allowed to rewild and grow unrestricted to provide biodiversity enhancement to the agricultural grassland site.

Frontage wall will be retained and restored where necessary, with woodland mix to be planted. It is anticipated that the boundary to the south will need to be removed during construction to facilitate site access and installation of the tank. This will be replanted with woodland mix.

Planting to the north and east will be retained as much as possible. Space between the existing and new tanks has been minimised in the design as much as possible. The ground will be graded and sloped up to the tank.

A section of hawthorn hedgerow (approx. 10 m) will be removed between the existing and new tanks (west of existing tank).

Stone ditch and corner ditch stone will be retained. Proposed landscaping is shown in Drawing 10025936-ATK-B2-ZZ-DR-CE-211723 (Appendix 3-1 of Volume 3 of the EIAR).

3.2.9.3 Construction Works

The existing Bonniconlon Reservoir will remain operational throughout the construction works, insofar as practicable. The works will be planned and sequenced to maintain continuity of supply to the Bonniconlon supply area during construction, testing and commissioning. Where temporary isolations, tie-ins or operational constraints are required, these will be planned in advance and agreed with Uisce Éireann Operations.

The construction works will comprise site establishment, creation of temporary working areas, vegetation clearance, formation of temporary construction access, excavation and ground preparation, construction of the new treated water storage reservoir, installation of associated pipework, chambers, instrumentation and ducting, integration with the existing reservoir and network, construction of the dechlorination chamber, reinstatement of boundary features, and landscaping and biodiversity enhancement works.

The final construction methodology, phasing and temporary works arrangements will be confirmed by the Appointed Contractor during detailed design and construction planning. Any refinements will remain within the project description, design parameters and environmental assessments in this EIAR and will be implemented in accordance with the CEMP, Traffic Management Plan, CRWMP and other relevant construction management plans (see Section 3.3.4).

Initial works will include site establishment, demarcation of the construction working area, confirmation and protection of existing operational assets, buried services, boundary features, mature vegetation and drainage features, and implementation of temporary traffic management measures where required. A temporary site compound and temporary working area will be established within the identified construction area, as described in Section 3.3.6. Construction access will be taken from the private lane to the south-west of the site, subject to landowner agreement and the traffic management measures set out in the Contractor’s Traffic Management Plan. On completion of the works, temporary access arrangements will be removed and affected boundaries reinstated.

Vegetation clearance will be limited to that required to facilitate safe construction access, reservoir installation, pipework connections and boundary works. Existing boundary features, mature trees and retained planting will be protected where practicable. Where hedgerow, trees or scrub require removal, this will be undertaken in accordance with the CEMP (see Section 3.3.4.1), ecological mitigation measures and any seasonal constraints identified in the biodiversity assessment.

Excavation and ground grading will then be undertaken to form the reservoir platform, pipework trenches, chambers and associated working areas. Based on the current design, excavation depths at the site are anticipated to be approx. 2 m bgl on average, although depths will vary locally depending on final formation levels, foundation requirements, pipework cover, chamber depths and ground conditions. Estimated volumes are provided in Section 3.6. Topsoil and subsoil will be stripped separately and stored in designated stockpile areas for potential re-use. Excavated material will be managed in accordance with the CRWMP (see Section 3.3.4.5). Suitable excavated material will be re-used on site where practicable for backfilling, ground regrading, formation of the reservoir berm and landscaping, subject to geotechnical suitability and environmental testing. Surplus or unsuitable material will be removed from site and transported to an appropriately authorised facility for recovery, treatment or disposal, as appropriate.

The new reservoir will be constructed adjacent to the existing reservoir. The reservoir is anticipated to comprise a precast concrete tank system or equivalent, which may be delivered to site as a complete unit or in sections for assembly on site, subject to final detailed design and transportation requirements. Foundations will be formed to the required level, including blinding and reinforcement or base preparation as required. The tank will then be installed or assembled, with associated inlet, outlet, overflow, scour, washout, access, ventilation, level monitoring and inspection arrangements provided in accordance with the final detailed design.

The existing reservoir will be retained and integrated with the new reservoir to provide a twin-cell treated water storage arrangement. The spacing between the existing and proposed reservoirs will be minimised as far as practicable while allowing for safe construction, inspection, maintenance access and protection of retained assets. The proposed top water level will be hydraulically matched to the existing reservoir to support balanced filling and drawdown.

Associated pipework will be installed in excavated trenches to connect the new reservoir to the existing inlet and outlet arrangements. This will include extension of the existing inlet main, provision of a dedicated outlet pipe, installation of valves, fittings, flowmeter chamber, scour / washout arrangements, overflow connection, level instrumentation and telemetry ducting. The existing bulk meter chamber will be retained and integrated into the revised pipework arrangement, where practicable. Electrical ducting and control / telemetry connections will be installed to the existing kiosk or other appropriate connection point, as confirmed during detailed design.

A new dechlorination chamber will be installed in the north-eastern part of the site to manage overflow water from the existing and proposed reservoir arrangement, where required by the final design. The chamber will be connected to the existing overflow system and will be accessible for inspection and maintenance. Where installation of the dechlorination chamber or associated pipework requires modification or relocation of existing utilities, including any ESB pole, stay or associated service, these works will be confirmed during detailed design and undertaken in consultation with the relevant utility provider.

Surface water generated from the new reservoir roof and associated impermeable areas will be managed through the proposed drainage arrangement, including the French drain around the base of the reservoir berm, where provided. The drainage system will be designed to allow infiltration to ground while avoiding erosion, ponding or uncontrolled runoff to adjoining lands or public roads. Construction-stage water management, sediment control and pollution prevention measures will be implemented in accordance with the CEMP (see Section 3.3.4.1).

Following completion of the structural, pipework, chamber, ducting and instrumentation works, the new reservoir and associated infrastructure will be tested and commissioned. Commissioning will include hydraulic testing, pressure testing where applicable, disinfection, flushing, verification of inlet and outlet operation, valve testing, level instrumentation and telemetry testing, overflow and scour / washout testing, and confirmation that the new and existing reservoirs can operate together as a twin-cell treated water storage arrangement.

Following commissioning, disturbed areas will be reinstated. This will include regrading around the reservoir, formation of the proposed soil berm, reinstatement of the temporary access area, restoration or repair of the existing frontage wall and boundary features where affected, installation of new fencing and pedestrian access between the existing and proposed reservoir areas, and implementation of landscaping and biodiversity enhancement measures. Planting and reinstatement will be undertaken in accordance with landowner agreements and the landscaping and biodiversity proposals included in this EIAR.

The works are anticipated to take approximately three to four months to complete. The works can be constructed independently of the wider Proposed Development; however, commissioning and integration of the new reservoir into operational service will be coordinated with the availability of a verified treated water supply from Lisglennon WTP. Construction works and traffic management will also be coordinated, where required, with installation of Pipeline D along the L51172 to minimise disruption to local road users, landowners and nearby residents.

3.2.9.4 Operation and Maintenance

The new Bonniconlon Reservoir will operate as a treated water storage asset within the Bonniconlon supply area. It will operate in conjunction with the retained existing reservoir to provide increased storage, operational flexibility and improved resilience of supply. The new and existing reservoirs will operate as a twin-cell treated water storage arrangement, with the proposed top water level hydraulically matched to the existing reservoir to support balanced filling and drawdown.

Inflow, outflow and storage levels governed by upstream supply conditions, downstream network demand and the hydraulic arrangement of the two reservoir cells. Level instrumentation, flow monitoring and overflow alarms will be integrated with the existing telemetry system to support remote monitoring and operational response. The reservoir arrangement will be incorporated into the wider network control strategy for the Bonniconlon supply area.

The inlet, outlet, isolation, overflow, scour and washout arrangements will be operated and maintained to allow either reservoir cell to be isolated, inspected, cleaned or taken out of service while maintaining supply through the other cell, where practicable. This will support planned maintenance and improve operational resilience when compared with the existing single-reservoir arrangement.

Routine operation and maintenance will include operator attendance, visual inspections, planned preventative maintenance and functional checks of the new and retained reservoir assets. This will include inspection and maintenance of tank access points, internal and external surfaces, inlet and outlet pipework, valves, flowmeter chamber, level instrumentation, telemetry equipment, overflow arrangements, scour / washout arrangements, access gates, fencing, lighting, drainage features and landscaped areas.

The reservoirs will be inspected, cleaned and disinfected in accordance with Uisce Éireann operational procedures, drinking water quality requirements and relevant health and safety controls. Any water generated during inspection, cleaning, flushing, scour or washout activities will be managed in accordance with Uisce Éireann operational procedures, the scour management proposals set out in Section 3.9 and relevant environmental controls.

The dechlorination chamber will be inspected and maintained as part of the routine operational maintenance regime. Where overflow water requires management through the dechlorination chamber, it will be treated and discharged or removed in accordance with the approved operational procedure and relevant environmental requirements. Access to the chamber will be maintained for inspection, emptying and maintenance.

The surface water drainage arrangement, including the French drain around the reservoir berm where provided, will be inspected and maintained to ensure continued infiltration performance and to prevent erosion, ponding

or uncontrolled runoff to adjoining lands or public roads. Boundary fencing, the retained frontage wall, access arrangements, pedestrian access between the existing and proposed reservoir areas, landscaping and biodiversity enhancement areas will also be inspected and maintained as part of routine site operations.

Operational access will continue from the L51172 local road, with access to the new reservoir provided through the retained and modified site access arrangements. Routine operational traffic will generally comprise operator inspections, sampling visits, maintenance vehicles, specialist contractor attendance and occasional tanker access where required for scour, washout, cleaning or dechlorination chamber maintenance.

3.3 Construction Overview

This section sets out an overview of the key aspects of the construction and operational phases for the Proposed Development.

3.3.1 Pre-construction surveys

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, but not limited to:

- Ecological assessments and surveys, including terrestrial, Non-Native Invasive Species and aquatic species. Ecological surveys will be seasonally driven, and the Appointed Contractor will be required to ensure that seasonally dependant surveys are conducted in the right season;
- Ground investigation and soil analysis;
- Archaeological assessments, including intrusive and non-intrusive investigations;
- Water quality monitoring, including levels at Wherrew Intake and upstream and downstream of the HDD crossing of the Brusna River;
- Existing utilities searches; and
- Road and bridge inspection surveys.

Pre-construction surveys are set out in the CEMP (see 3.3.4.1).

3.3.2 Working hours

Typical working hours during construction are anticipated to be from 07:00 to 19:00 Monday to Friday and 08:00 to 13:00 on Saturdays, with no work on Sundays or public holidays unless otherwise agreed with the Local Authority or other key stakeholders.

Exceptions may be required for certain construction activities which would need to be undertaken outside typical working hours. This includes trenchless crossing techniques, surface finishing works, abnormal loads, emergency response and avoidance of significant traffic disruption.

Works to be undertaken outside typical working hours will be agreed with the county councils (Mayo and Sligo) in advance and supported by coordination with the Gardaí and Transport Infrastructure Ireland (TII) as required and communicated to the affected community. The protocol for communication prior to and during the works will be set out in the appropriate Construction Plans (see Section 3.3.4).

3.3.3 Personnel

The Proposed Development spans several sites and approx. 30 km of mains laying. The works require a number of discrete work packages. Approx. 126 on-site staff will be present during peak construction periods. These are summarised in Table 3-6.

Table 3-6 — Anticipated number of workers deployed on site throughout construction phase

Work Package	No of workers (per element)
Intake works	20
Pumping station	15
WTP	45
New mains	30
Trenchless methodology	8
Non-construction (Operational) staff	8
Total on-site construction staff at peak construction periods	126

It is anticipated that the number of workers on site will fluctuate throughout the programme. During the Operational Phase, it is anticipated that approx. 8 staff will be employed on a regular basis to operate the works.

3.3.4 Construction Plans

A number of environmental management plans will be prepared by the Appointed Contractor and implemented prior to the commencement of works and adhered to throughout construction to commissioning. These plans will contain all the required environmental mitigation and monitoring measures identified in this EIAR (see Chapter 21) and the NIS, as well as any requirements of the planning permission. These include:

- CEMP;
- Construction Works Traffic Management Plan (CWTMP);
- Stakeholder Communications Plan;
- Public Rights of Way (ProW) Management Strategy;
- CRWMP;
- Tree Protection Plan; and
- Biosecurity Management Plan.

A CEMP, Arboricultural Impact Assessment, CRWMP and Construction Works Preliminary TMP have been submitted with the Application and inform the assessment presented in this EIAR and NIS conclusions.

3.3.4.1 Environmental Management

Environmental Management will be implemented via the CEMP. A CEMP has been submitted as Appendix 3-3 of this EIAR, and includes provision for the following:

- Mitigation and monitoring measures and environmental protection, including:
- Ecology surveys and ecological monitoring via an Ecological Clerk of Works (ECoW);
- Environmental monitoring and assessments will be managed by the Site Environmental Manager (SEM). The SEM will be responsible for preparing monitoring reports for submission to Uisce Éireann. The SEM will be responsible for managing complaints from stakeholders.

- Pre-Construction Archaeological monitoring by a licensed Archaeologist;
- Environmental sampling and analysis. UÉ carries out baseline raw water quality analysis at the Wherrew Raw Water Intake. Parameters measured include monthly analysis for alkalinity, pH, turbidity and E.coli. Biannual raw water analysis on the raw water intake from Lough Conn include the list above plus aluminium, chloride, iron, manganese, sulphate, temperature, and total dissolved solids.
- Silt and sediment controls;
- Waste Management;
- Noise and vibration controls;
- Traffic Management;
- Pollution prevention measures and spill response;
- Details of Emergency Plan;
- Details of fuel and chemical storage;
- Details of plant storage and temporary offices;
- Dust control measures;
- Site run-off management;
- Management of HDD operations;
- Management of stockpiles;
- Record keeping;
- Complaints procedures; and
- Training, auditing and reporting.

The CEMP will support development of the project-specific CEMP which will be prepared by the Appointed Contractor, in consultation with the relevant local authorities and submitted for agreement, in advance of commencement of construction and will be fully implemented for the duration of the construction phase to commissioning. The CEMP will set out the Appointed Contractors overall management and administration.

Given the sensitivity of the sites, it is proposed that a Site Environmental Manager (SEM), a Waste Management Coordinator (WMC) as well as a suitably qualified Ecological Clerk of Works (ECoW) will be retained by the Appointed Contractor. The Site Environmental Manager should be suitably qualified to Level 8 National Framework Qualification (NFQ) in subjects related to water, soil, geology, or hydrogeology and waste management. The appointed Environmental Manager will have suitable experience in projects of this type and size. The WMC should be suitability qualified in waste management and have experience in managing wastes from construction sites.

3.3.4.2 Traffic Management

The Appointed Contractor will be required to prepare a Construction Traffic Management Plan (CTMP). The plan will maximise workforce safety and the public during the construction of the Proposed Development. A combination of stop/go systems, road closures and diversions will be utilised as agreed with the Local Authority during the installation of the new trunk main. The seasonal nature of traffic patterns will be taken into account, a detailed constraints analysis identifying key complexities in the design as well as a detailed design of each identified crossing or location will be agreed with the local authority in advance of construction. Where there is potential for access to private lands to be obstructed, works will be coordinated with the relevant landowners in advance of the works.

A Construction Works Preliminary Traffic Management Plan (CWPTMP) will be produced prior to the start of construction and implemented by the Appointed Contractor. This plan will set out key sensitivities (e.g. bridges, culverts, narrow roads), proposed management measures and alternative routes. The details of the Traffic Management Plan will be agreed with the roads departments of the county councils and TII (where measures relate to national roads) in advance of construction activities commencing on site. Please refer to Chapter 15 – Roads, Traffic and Transportation and the CWPTMP (Appendix 15-4).

3.3.4.3 Stakeholder Communication Plan

A protocol for communication with the Local Authorities, stakeholders and the public will be set out in a Stakeholder Communication Plan, which will be produced in advance of the works by the Appointed Contractor.

3.3.4.4 Tree Protection Plan

The woodland around Belleek contains a number of notable tree specimens, as well as health and safety risks to staff working on the Proposed Development. An Arboricultural Impact Statement has been submitted as Appendix 7-1 of this EIAR, which contains arboricultural method statements for the protection of trees and health and safety considerations for workers within the woodland area, to be followed by the Appointed Contractor prior to and during construction works. Provisions will be incorporated into proposed site layout in the form of a Tree Protection Plan in advance of works within Belleek Woods.

3.3.4.5 Resource and Waste Management

The construction of the Proposed Development will be in accordance with the CRWMP produced by the Appointed Contractor in advance of the works, based on updated site information. The CRWMP will provide a mechanism for monitoring and auditing waste management performance and compliance for the duration of construction works. A CRWMP has been produced and submitted as Appendix 14-1 of this EIAR which has been prepared in accordance with the relevant guidance 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition projects' (EPA, 2022). The document also provides a detailed overview of key waste management considerations for the Proposed Development at this stage, while also allowing for further enhancement as the Proposed Development progresses through to the detailed design and construction stages. Further details are provided in Section 3.6. See also Chapter 14 – Resource and Waste Management.

3.3.4.6 Invasive Non-Native Species

A Biosecurity Management Plan (BMP) to control the spread of INNS will be prepared in advance of the works in consultation with the local planning authorities, National Parks and Wildlife (NPWS) and Inland Fisheries Ireland (IFI). This will be prepared in accordance with. S.I. No. 374/2024 - European Union (Invasive Alien Species) Regulations 2024 and S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011 as amended and relevant guidelines.

3.3.5 Construction and Operation Vehicles

3.3.5.1 Construction Vehicles

While a range of vehicle types will be used during construction phase, some will be associated with discrete work packages. Construction traffic will typically comprise standard vehicles required for excavation, materials delivery, plant mobilisation, spoil removal and general site servicing. This may include light commercial vehicles, rigid and articulated Heavy Goods Vehicles (HGVs), concrete delivery vehicles, plant transporters and specialist delivery vehicles. The Appointed Contractor will confirm final vehicle requirements prior to construction. It is anticipated that the number of vehicles on site will fluctuate throughout the programme, however it is anticipated that the bulk of vehicle movements will be over 24 months.

Vehicles anticipated to use public roads would include:

- Cars and other people carriers;
- Light Goods Vehicles (e.g. transit and delivery vans);

- Ordinary Goods Vehicle Type 1 (e.g. rigid vehicles with two or three axles including tractors, box vans, backhoe diggers and trucks which have double rear wheels); and
- Ordinary Goods Vehicle Type 2 such as rigid vehicles with four or more axles, commonly known as a heavy goods vehicle (HGV).

All equipment or vehicles that cannot be driven to site will be transported using a suitable vehicle such as a truck or HGV.

No abnormal loads (i.e. bigger than Ordinary Goods Vehicle Type 2) are currently envisaged. Should an alternative construction methodology require abnormal loads, these will be agreed in advance with the Local Authority and Roads Authority where required.

Construction Traffic Movement is estimated as follows:

- HGV Trips per day = 82 veh/day (or) 246 pcu/day; and
- Staff Trips per day = 148 veh/day (or) 148 pcu/day.

Overall, Construction plus Staff Movement is anticipated to equate to 230 veh/day (or) 394 pcu/day, representing two-way vehicle movements as a worst-case scenario (see Chapter 15 – Roads, Traffic and Transportation).

3.3.5.2 Operational vehicles

Operational vehicles are anticipated to be predominantly related to staff movements, encompassing 25–50 daily vehicle movements for the entire Proposed Development, with the exception of Lisglennon WTP (see Chapter 15 – Roads, Traffic and Transportation).

For Lisglennon WTP, it is envisaged that there will be an addition of 2–3 HGV trips per week, typically during off peak hours for maintenance and delivery purposes, including removal of sludge offsite and delivery of chemicals (see Chapter 15 – Roads, Traffic and Transportation).

The operational phase is expected to generate up to 16 additional two-way vehicle trips per day (approximately 21 PCU/day) at the majority of sites and 4 additional two-way vehicle trips per day (approximately 4 PCU/day) at the Wherrew Intake and RWPS sites. These trips will primarily comprise staff travel, maintenance visits, scheduled deliveries and occasional HGV movements.

Occasional HGV trips are anticipated for operational and maintenance purposes, including sludge removal from Lisglennon WTP and chemical deliveries to Lisglennon and Lough Talt WTP. At the Wherrew Intake and RWPS sites, traffic will be limited to occasional operator and maintenance-related visits.

For assessment purposes, a conservative distribution of daily trips has been assumed as follows for all sites except Wherrew Intake and RWPS:

- **AM Peak:** 6 two-way trips;
- **Off-Peak:** 6 two-way trips; and
- **PM Peak:** 4 two-way trips.

3.3.6 Site Compounds and Temporary Working Areas

3.3.6.1 General set-up and layout

Indicative Site compound locations and temporary working areas (TWAs) will be required to facilitate the safe movement of vehicles, staff and unloading and offloading equipment, as well as accommodate storage of materials, waste management and welfare facilities. The overall layout of temporary compounds will be set out by the Appointed Contractor and will, as a minimum, comply with the following:

- Access and egress will be through the existing paved access roads off the main road, however where temporary roads are envisaged, these will be detailed in Section 3.2 where appropriate.
- A set down area will be allocated for overnight plant storage and a laydown area for materials. Items including waste management, power generation and storage of materials are incorporated into the temporary design. The location of the site compound set up allows for close monitoring of the works.
- A dedicated area within the compound for refuelling plant or any other equipment that is bunded and has the necessary spill kit equipment available as and when required.
- Dedicated areas for storage of diesel, refuelling area, storage of waste, site office for keeping records will also be included.
- An area for the placement of labelled covered skips for the collection and storage of municipal wastes generated in the canteen, WEEE, timber, plastic, cardboard etc.
- All site compounds and associated TWAs will be included within the Red Line Boundary.

Final compound layouts will be subject to environmental review and comply with the mitigation and constraints outlined in the EIAR and NIS. It will be a contractual requirement to ensure appropriate spill and pollution prevention and response measures are provided by Contractors, in line with the requirements of the CEMP and the mitigation measures given in the EIAR. Used spill kits will be correctly disposed of and replaced. Spill management procedures training will be provided as part of the Site Induction Training.

Sufficient parking will be available on site and the following site storage and temporary welfare facilities comprising of the following non exhaustive list:

- Canteen;
- Serviced Toilet;
- Site office;
- Site storage containers; and,
- A number of waste skip for containing different waste streams e.g. steel, timber, plastics.

The location, size and suitability of the compound(s) will ultimately be at the discretion of the Appointed Contractor once it is located within the project red line boundary and is compliant with the Planning Permission, the EIAR and site access approved by the Local Authority.

The location and layout of the construction compound(s) selected by the contractor will however have to incorporate management and mitigation measures to avoid any potential impacts to environmental receptors. Site access for all personnel and visitors will be strictly controlled and all visitors will report to the site compound prior to entering the construction area.

The Appointed Contractor shall ensure that all compound-related activities are appropriately assessed and managed. This includes implementing site-specific specifications and environmental commitments for the project, with particular attention to avoiding significant adverse effects on the surrounding environment and community. The Appointed Contractor will provide adequate security at these sites.

3.3.6.2 Site Compound and Temporary Working Area Locations

Indicative site compounds have been identified at Wherrew RWI&PS (Figure 3-37), Lisglennon RWS&PS (Figure 3-38) and Lisglennon WTP (Figure 3-39), Bonniconlon BPS (Figure 3-40) Windy Gap BPT (Figure 3-41), Lough Talt Reservoir (Figure 3-42) and Bonniconlon Reservoir (Figure 3-43). One further TWA has been identified on the R314 (adjacent to Laughtadawannagh) (Figure 3-44). These will be to support construction at these sites and along the pipeline route, as well as for storage of construction materials along with stockpiling of spoil. TWAs within sites such as Lisglennon WTP will also be utilised as compound areas for equipment and materials storage as well as installation of temporary office and welfare facilities during construction of pipelines.

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Figure 3-37 — Site Compounds and Temporary Working Areas: Wherrew Raw Water Intake & Pumping Station (RWI&PS)



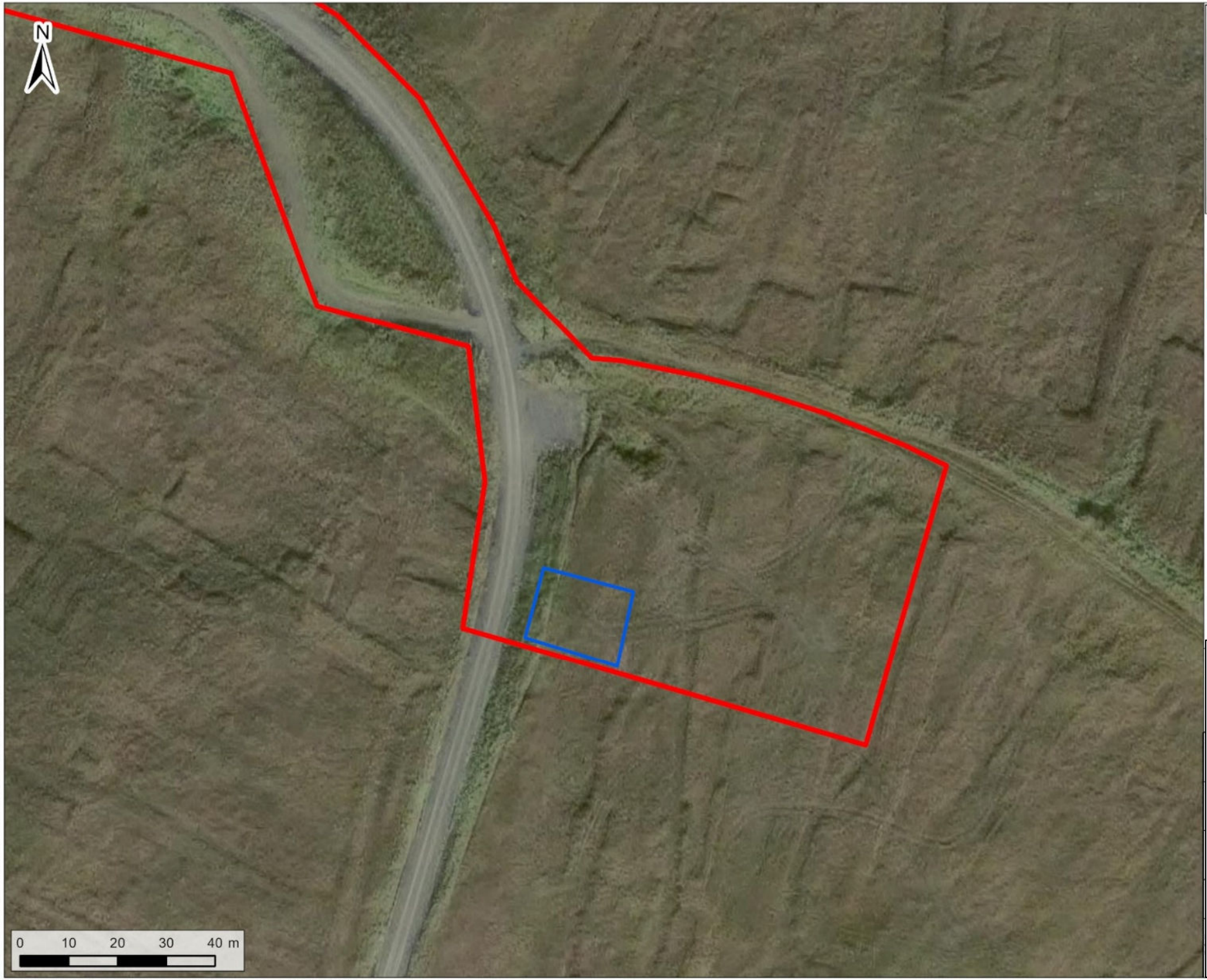
Figure 3-38 - Site Compounds and Temporary Working Areas: Lisglennon Raw Water Storage and Pumping Station (RWS&PS)



Figure 3-39 - Site Compounds and Temporary Working Areas: Lisglennon Water Treatment Plant (WTP)



Figure 3-40 - Site Compounds and Temporary Working Areas. Bonniconlon Booster Pumping Station (BPS)





Legend

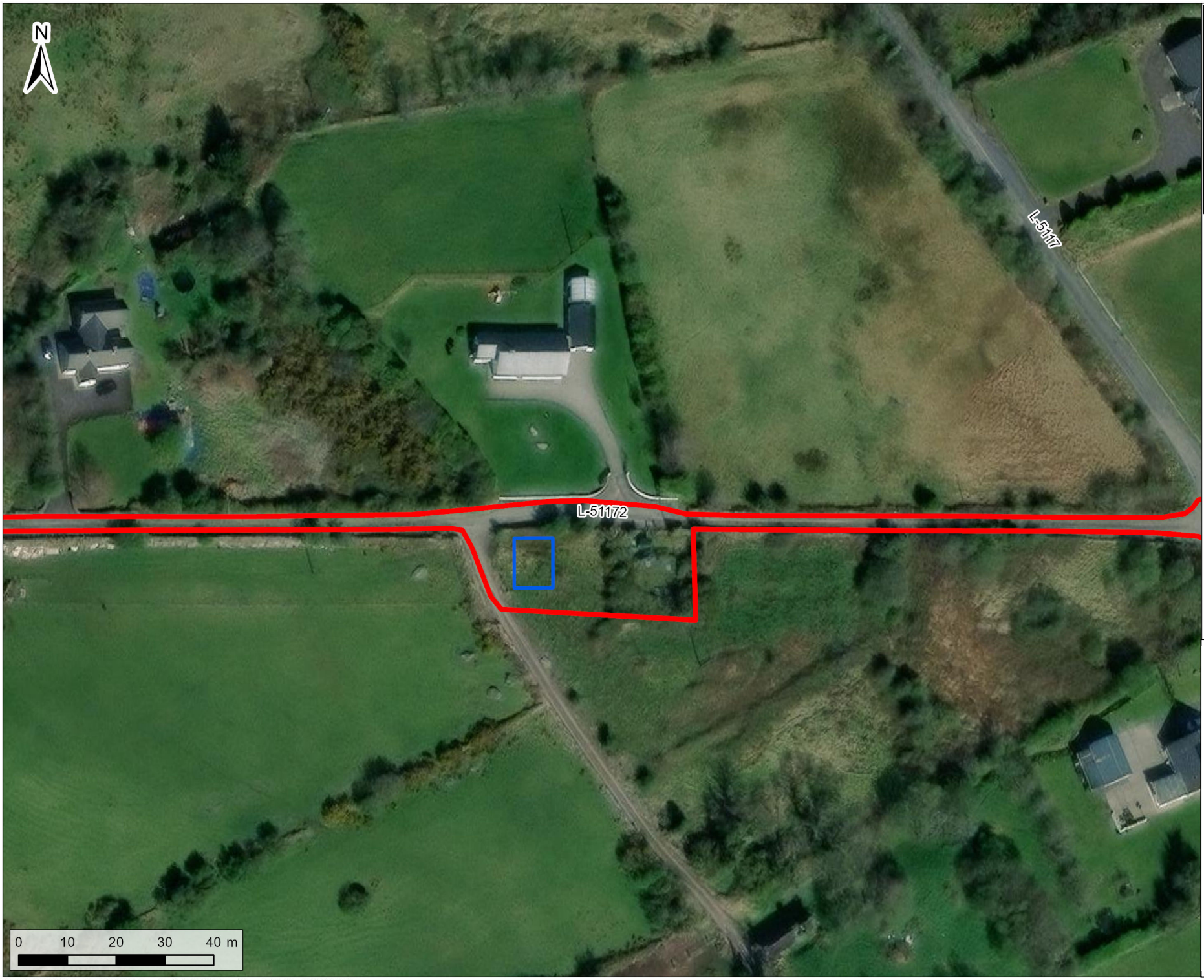
- Current Extent Location
- Red Line Boundary
- Potential Site Compound

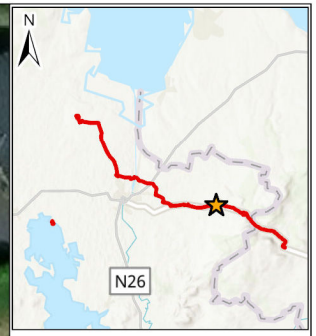
DO NOT SCALE

Figure 3-41 - Site Compounds and Temporary Working Areas. Windy Gap Break Pressure Tank (BPT)



Figure 3-42 - Site Compounds and Temporary Working Areas. Lough Talt Water Treatment Plant (WTP)





Legend

- Current Extent Location
- Red Line Boundary
- Potential Site Compound

DO NOT SCALE

Figure 3-43 — Site Compounds and Temporary Working Areas. Bonniconlon Reservoir

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Figure 3-44 — Site Compounds and Temporary Working Areas. Temporary Working Area on R314 (adjacent to Laughtadawannagh)

For pipeline installation, the construction working width, i.e. the extent of temporary works area required for installation of a pipeline, will typically be aligned with the agreed wayleave on agricultural land. In general, the temporary working width will be 20 m except where additional space is required and is agreed with the relevant landowner, such as crossings, sections with significant bends or other site-specific constraints, such as features of cultural significance or ecological value requiring site-specific mitigation measures. These have been included in the Red Line Boundary. On roads, appropriate traffic management measures to ensure safety of the workers and road users will be implemented throughout the works, including stop-go systems, road closures and diversions and effective communication in advance. These and other environmental measures will be set out in the CWTMP and other relevant construction management plans (see Section 3.3.4 above). All temporary works will comply with applicable road-safety guidance, and measures will be adapted as required to protect road users, local residents, and the construction workforce. The construction working width in private lands will typically be maximum 10 m. Exceptions which may increase or reduce the working width can be expected where installation can be expected to be complex (e.g. a crossing) or space is constrained (within a built-up area).

Any existing drains within temporary working areas or which intersect with the construction working width will be recorded and temporarily culverted, to be restored as part of site reinstatement.

Physical site security will be provided, including site fencing which will generally be in the form of a 2.4 m boundary fence and manual gates.

Additional lighting will be required for new or extended sites and will be designed with reference to the following Standards:

- Lighting Guide LG06: The Exterior Environment (Chartered Institution of Building Services Engineers 2016);
- 2017 Guide on the Limitation of Effects of Obtrusive Lighting from Outdoor Lighting Installations 2nd Edition (Commission Internationale de l'Eclairage 2017); and
- Bats and Artificial Lighting at Night. Guidance Note 08/23 (Bat Conservation Trust, 2023).

In general, external lighting would be designed to minimise environmental disturbance, including night sky pollution/upward spill, overspill into adjacent properties and disturbance to light-sensitive species (e.g. bats). This could include downward directional lighting and use of accessories such as hoods, cowls, louvres and shields to direct the light is required, as well as use of motion-sensors and short (one minute) timers.

3.4 Noise and Vibration

A summary of the main sources of noise is provided in this section. The assessment of construction and operational noise effects is provided in Chapter 13 – Noise and Vibration.

3.4.1 Construction noise

It is anticipated that a temporary increase in noise and vibration can be expected as part of construction activities. The following activities have been identified as comparatively noisy:

- Site Clearance and enabling works;
- Trenching and excavation;
- Pipe laying and specialised crossings;
- Piling and compaction;
- Construction Vibration (e.g. from HDD); and

- Construction traffic.

The Appointed Contractor will be required to comply with "*Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes,* issued by the Transport Infrastructure Ireland (TII) (2014). Standards are set out for construction noise in Table 3-7 and construction vibration in Table 3-8.

Table 3-7 — Recommended noise thresholds during construction works (from: TII, 2014).

Day	Working Hours	Level dB (LAeq,1hr)[1]
Mon-Fri	07.00 – 19.00	70
Mon-Fri	19.00 – 22.00	60*
Saturday	08.00 – 16.30	65
Sundays & Bank Holidays	08.00 – 16.30	60*

* Construction activity at these times, other than emergency works, will normally require specific permission from the local authority.

Table 3-8 — Recommended vibration thresholds during construction works (from: TII, 2014).

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:		
<10Hz	**10-50 Hz**	**50-100 Hz (and above)**
8mm/s	12.5 mm/s	20 mm/s

A CEMP has been produced and submitted as Appendix 3-3 of this EIAR (see Section 3.3.4) and includes proposed noise mitigation measures to manage the potential environmental impacts of construction noise. Noise mitigation measures will be site-specific, however the following measures will be considered where appropriate:

- Noise and vibration monitoring will be implemented at all sites to track compliance with the recommended thresholds for construction works;
- Installation of acoustic blankets on fences may be installed if required; and,
- A noise complaints procedure will be set out in the Communications Plan, so that the Appointed Contractor can receive, record, investigate and resolve any concerns as they arise.
- The Appointed Contractor will engage the services of an acoustic consultant to carry out noise monitoring at the nearest noise sensitive location(s) to the construction works. Noise monitoring will be carried out as per the requirements of ISO 1996.

3.4.2 Operational noise

Operational noise will be associated with operational plant and equipment and operational traffic. The following operational noise thresholds have been adopted based on Environmental Protection Agency (EPA) NG4: Guidance note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (EPA NG4 noise criteria) for operational noise, and BS 6472-1:2008 (Guide to evaluation of human exposure

[1] These limits are applied at the facades of noise-sensitive locations (NSLs) during construction of the Proposed Development. Please see Chapter 13 – Noise and Vibration.

to vibration in buildings) for vibration. Stricter noise levels (L_{AF90}) will be applied where an area is shown to have low background noise, as shown in Table 3-9. Vibration levels are shown in Table 3-10.

Table 3-9 — Operational Noise standards (from: EPA NG4)

Location	Day-time Noise Criterion, dB LAr,T (07:00 to 19:00 hrs)	Evening Noise Criterion, dB LAr,T (19:00 to 23:00 hrs)	Night-time Noise Criterion, dB LAeq,T (23:00 to 07:00 hrs)
Areas of Low Background Noise	45 dB	40 dB	35 dB
All other Areas	55 dB	50 dB	45 dB

Table 3-10 — Operational vibration standards for internal assessment (from: BS 6472-1:2008 – Guide to evaluation of human exposure to vibration in buildings)

Place and time	Low probability of adverse comment m·s-1.75	Adverse comment possible m·s-1.75	Adverse comment probable m·s-1.75
Residential buildings 16 h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 h night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

Noise mitigation measures will be site specific, however the following measures will be considered where appropriate:

- All equipment will be installed in accordance with manufacturer's specifications;
- Where applicable, equipment will be isolated;
- A noise complaints procedure has been established by Uisce Éireann as part of their customer service and is available online for use by the general public (Uisce Éireann, 2021).

3.5 Renewable Energy Provision

Improving energy efficiency is a key sustainability measure for improving carbon footprint and reducing greenhouse gas emissions. Renewable energy provision is included to offset electricity consumed in the treatment and pumping of water as part of the Proposed Development.

It is proposed to install solar panels at Lisglennon WTP, Bonniconlon BPS and Lough Talt WTP where feasible to supplement the power requirements of each site. It is intended that electricity generated by these solar panels will be consumed on site and not be exported to the grid.

It is anticipated that panels will be monocrystalline silicon 565 W PV panels (or similar) with tempered glass, with a typical panel size of 1.13 m x 2.28 m. Anticipated key panel data is presented in Table 3-11.

Table 3-11 — Anticipated key panel data, based on monocrystalline silicon 565 W PV panels

Parameter	Dimension
Panel Width (m)	1.133
Panel Length (m)	2.278
Panel Surface Area (m^2)	2.581
Panel effective Surface Area, Including Walkways & Access Requirements (m^2)	3.7
Annual Mayo utilisable sunlight hours (h)	965

The anticipated installed solar capacity across the Proposed Development is presented in Table 3-12.

Table 3-12 — Proposed solar capacities across the Proposed Development

Description	Unit	Lisglennon WTP	Bonniconlon BPS	Lough Talt WTP
Number of Solar panels	No.	344	26	14
Area required	m^2	1271	95	53
Solar power generated	kW	194	13	8
Site power demand	kW	177	320	8
% of Site power provided by solar energy	%	110%	4%	100%
Annual solar energy generated	kWh	187,210	12,981	7,720
Annual site energy demand	kWh	733,226	2,199,490	30,386
Max. % of Annual site energy provided by solar energy	%	11%	1%	11%

Indicative areas which are considered suitable for the installation of solar PV are shown in have been included in the proposed layout figures for each site, as follows:

- Lisglennon WTP – Figure 3-17;
- Bonniconlon BPS – Figure 3-22; and
- Lough Talt WTP – Figure 3-31.

A glint and glare assessment is provided in Appendix 18-2, Volume 3 of the EIAR.

3.6 Excavated Materials

Cut and fill values are based on ground investigation results undertaken to support development of the overall Proposed Development and are anticipated to be updated following detailed design undertaken by the Appointed Contractor prior to commencement.

3.6.1 Cut and fill principles

A circular economy approach will be taken to excavated materials. Any material excavated during the course of construction will be segregated by class (Table 3-13), based on the materials found during the ground investigation works, and re-used within the Proposed Development where possible. For surplus material, emphasis will be on re-use on nearby or anticipated future projects or recycling at appropriate facilities. Material that cannot be re-used or recycled will be sent to an appropriate licensed facility for disposal.

Cut and fill calculations have been undertaken considering the dimensions of the pipe, required bedding and cover as well as interference with land use above (e.g. agricultural versus road).

Table 3-13 — Classification of excavated material and opportunities for re-use

Soil Type	Opportunities
General Fill - Granular	Re-use at project site, other projects adjacent in the immediate future
General Fill - cohesive	Re-use at project site, other projects adjacent in the immediate future
Landscape	Re-use at project site, other projects adjacent in the immediate future
Site won - top soil	Re-use at project site, other projects adjacent in the immediate future
Crushed Rock	Re-use at project site, other projects adjacent in the immediate future
Asphalt	Potential to be sent to Roadstone to be used in the production of asphalt
Peat	Re-used as landscaping or restoration
Inert material	Potential for re-use
Contaminated	To be sent to licenced facility

3.6.2 Quantity Summary

A high-level assessment was carried out to estimate the amount of excavated material that could potentially be re-used as backfill (Table 3-14). Excavated material will be considered suitable where it is found to be clean (i.e. free of contaminants) and of the appropriate classification for the intended use. The assessment was based on Geological Survey Ireland (GSI) quaternary sediments database and took into consideration the different pipe diameters along the trunk main and relevant trench width in accordance with UÉ standards.

Whilst alluvium, blanket peat and cut over raised peat sediments are not considered suitable materials for backfill, peat could be reusable for creating wetland, peatland or for biodiversity. For all other types of sediments, a percentage of re-use was assumed at different depths and types of surface (see Chapter 14 – Resource and Waste Management and Appendix 14-1 CRWMP, Volume 3 of the EIAR).

As it is envisaged that a significant portion of the excavated material will not be suitable for re-use, various opportunities such as a registration notification as a byproduct for greenfield sites under Article 27 to the Environmental Protection Agency (EPA) will be investigated. End of Waste applications under Article 28 for road planings and waste bitumen and reuse in Reclaimed Asphalt Pavement (RAP) sites will be investigated by the

Appointed Contractor. Surplus material, where suitable will be used on site for landfilling or backfilling purposes. The management of surplus materials and resources is considered in Chapter 14 – Resource and Waste Management of the EIAR.

Table 3-14 — Excavated Material Quantities and estimated quantities for re-use

Description of Works	Estimated Total Volume of Excavation (m^3)	Estimated Volume of Excavated Material for Re-use / Recovery on site (m^3)	Estimated Volume of Excavated Material to be taken off-site for reuse/recovery (m^3)
Pipelines	79,095	16,951	62,144
Sites	15,544	10,545	4,999
Total m^3 (%)	94,639	27,496 (29%)	67,143 (71%)

3.6.3 Management of excavated materials

General measures for the management of excavated materials are provided below. These will be implemented at all sites where applicable.

- Topsoil and subsoil will be stripped and stockpiled separately in designated stockpiles located within the RLB.
- Topsoil and subsoil will not be mixed and will be stored in separate stockpiles positioned within designated areas to facilitate later reinstatement. Stockpiles will be positioned a minimum 20 m from the nearest water course(s).
- Excavated rock will be stockpiled within the Red Line Boundary and removed for offsite disposal to a suitably licensed / permitted waste facility, with the appropriate soil testing carried out. The Appointed Contractor may crush and screen and use for backfill material, if suitable and meets Uisce Éireann's specifications.
- Areas designated for Stockpiling of excavated material will be segregated from construction traffic and kept away from waste that may be l contaminated.
- There is potential for interaction with groundwater to occur during the excavation works. Dewatering and disposal measures will be put in place during excavations.
- Water will be discharged in accordance with the water management measures set out in Section 3.9.
- Grips will be constructed to redirect rainwater and may be filled with drainage stone where applicable.
- A temporary access road area will be excavated, and material will be moved to spoil heaps for further re-use as landscaping at the site.

3.6.4 Contaminated land

The proposed pipe will primarily be located along local and private fields and roads in rural / agricultural areas and will pass in the vicinity of a limited number of industrial and commercial premises. Based on the chemical testing results of the Ground Investigation Report (Appendix 9-1) and surrounding land use, the risk of discovering unexpected onsite contamination is low, however it may be present in areas that were not investigated. To mitigate the potential of contamination to water transported by the Proposed Development, pipes and fittings resistant to permeation by contaminants will be installed in any areas found to be affected by hydrocarbon contamination.

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3.7 Biodiversity and Sustainability

Biodiversity protection is a key part of Uisce Éireann's Biodiversity (Uisce Éireann, 2018) and Sustainability (Uisce Éireann, 2021) Policies.

3.7.1 Biodiversity

The overall aim of Uisce Éireann's Biodiversity Policy (Uisce Éireann, 2018) is that in association with the provision of water and wastewater services, biodiversity and the natural environment are conserved, protected and where practical enhanced through our responsible stewardship, sustainable water services and strong partnerships. Uisce Éireann launched a Biodiversity Action Plan in 2021, updated in 2025 (Uisce Éireann, 2025) to deliver on this aim.

The Proposed Development will result in the loss of habitats. Habitat loss will predominantly be in areas of hedgerow, grassland, wet grassland, wetland, and woodland. Proposed biodiversity enhancement measures and landscaping design will deliver a net biodiversity gain in line with Uisce Éireann's objectives outlined in their Biodiversity Action Plan, as follows: '*Actively seek opportunities for biodiversity net gain by identifying opportunities for biodiversity enhancement at both existing and proposed Irish Water sites*'.

Habitats across all sections of the project have been mapped, assessed and given a biodiversity score, and through proposed biodiversity enhancement measures and landscaping design, net biodiversity gain will be achieved by providing for the reinstatement and re-establishment of any habitats potentially affected or impacted by the Proposed Development to a level of higher or equal ecological value compared to the pre-construction baseline conditions (see Chapter 7 – Biodiversity).

3.7.2 Sustainability

The Preliminary Design of the Proposed Development has taken into consideration Uisce Éireann's sustainability ambitions. Uisce Éireann have prepared a Sustainability Framework that faces the challenges of delivering transformative water services that enable communities to thrive. The Framework is founded on four pillars – Environment, Social, Collaboration and Governance, that enables Uisce Éireann take a holistic approach to sustainability in water services:

- Environment: Carbon measurement & reduction, Waste Management, Resource Efficiency – Water/energy, Biodiversity;
- Social: Diversity, Inclusion & Equality, Education, Health, Safety & Wellbeing, Community Infrastructure;
- Collaboration: Circular Economy, Responsible Sourcing/Supply Chain, Research & Innovation; and
- Governance: Creating a culture of sustainability compliance and excellence.

The Uisce Éireann Sustainability Framework has six key sustainability ambitions:

1. Carbon: Net Zero by 2040;
2. Biodiversity: Net Gain across all new projects by 2030;
3. Customer: Achieve Sustainable Economic Levels of Leakage by 2034 in the Water Resource Zones that produce >10,000 m^3/day;
4. Employee: Diversity, Inclusion and Equality – achieve inclusion index of 80% by 2030;
5. Community: Educate one million people on the value of water by 2030; and

6. Circular Economy: Ensure circular solutions are considered at each phase in all Uisce Éireann capital projects by 2026.

A Whole Life Carbon Assessment for the Proposed Development has been prepared and is presented in Chapter 12 – Climate.

3.8 Site Lighting

An Outdoor Lighting Report was prepared by AtkinsRéalis by using Lighting Reality (2025) design software, and is included in the Strategic Infrastructure Development (SID) Engineering Report (10025936-ATK-ZZ-ZZ-RP-ZZ-253002) submitted with the application.

The Outdoor Lighting Report has been developed in consultation with bat and biodiversity specialists, ecologists and is in line with the guidelines and legislation for the protection of bats with an aim of minimising disruption and disturbance to local bat populations. As included within the report, the 'Guidance Note 08/23; Bats and Artificial Lighting at Night - Institute of Lighting Professionals' (Bat Conservation Trust and Institute of Lighting Professionals, 2023) has been considered with regards to reducing impact on local bat populations.

The design of external lighting for proposed works at all the sites will be carried out with reference to the following Standards:

- Lighting Guide LG06: The Exterior Environment (Chartered Institution of Building Services Engineers 2016);
- 150:2017 Guide on the Limitation of Effects of Obtrusive Lighting from Outdoor Lighting Installations 2nd Edition (Commission Internationale de l'Eclairage 2017);
- Bats and Artificial Lighting at Night. Guidance Note 08/23 (Bat Conservation Trust 2023);
- I.S. EN 13201-2:2015 ROAD LIGHTING - PART 2; and,
- BS 5489-1:2020 Design of road lighting.

The lighting installation would provide for a safe and secure environment for both pedestrians and drivers at the sites and to facilitate operational and maintenance works. The measures adopted are listed below:

- Exterior lighting would be turned off unless operational staff are present on-site;
- Luminaires (light fixtures), light standards (poles) and all other fixtures selected will be sensitive to the surrounding environment;
- The required luminance levels will be achieved by selecting the most appropriate luminaires and lamp sources and carefully implementing the agreed control philosophy for operation of exterior lighting;
- All luminaires used will be without UV/IR elements;
- A warm white spectrum (<2,700 kelvins (K) will be used to reduce the blue light component of the Light Emitting Diode (LED) spectrum; and,
- The positioning of outdoor lighting will be directed away from any adjacent linear habitats (e.g. hedgerows, treelines, rivers, woodland edge) to ensure that there is no light spill onto bat corridors.

For the Proposed Development, following type of external lighting is proposed:

- Approx. 1-1.5 m high bollard with directional propagation characteristic;
- Internal linear luminaire (in kiosks);
- Handrail luminaire;
- Wall mounted luminaire; and,

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- Post mounted luminaire (max. post height = 4 m).

3.9 Scour Management

Fittings are required to ensure safe operation of the water network and enable appropriate water management and maintenance and will be appropriately marked with indicator plates. These include sluice valves, hydrants, scour valves and washout hydrants, air valves, flow meters, Pressure Reducing Valves (PRVs) and thrust blocks.

Fittings and markers will be installed in accordance with the appropriate Uisce Éireann standards and specifications. Indicative locations have been included in the drawings, however final number and position will be subject to detailed design undertaken by the Appointed Contractor.

Dewatering and controlled scour discharges of raw and treated water are required as part of construction, commissioning and operation and maintenance activities. Raw water will be transferred from Wherrew RW&PS to Lisglennon WTP via Lisglennon RWS&PS. Treated water will be transferred along the treated water transfer mains as well at Lisglennon WTP, Bonniconlon BPS, 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 seven key locations, the scour proposal is listed in Table 3-15.

Table 3-15 — Proposed Scour Management for Infrastructure Sites

Site	Scour required	Discharge Method
Wherrew RWI&PS	Yes	Minimal volumes expected at flowmeter chamber and associated pipework. Untreated water, released back through the intake.
Lisglennon RWS&PS	Yes	Minimal volumes expected at flowmeter chamber and associated pipework. Raw water, discharge into nearby watercourse.
Lisglennon WTP	Yes	All process tanks on site can be drained into a dedicated drain down tank with a large holding capacity. This drain down tank can then be gradually emptied to the used washwater equalisation tanks which in turn will be recirculated to the head of the works after settlement.
Bonniconlon BPS	No	No scour anticipated as there is no storage at site.
Bonniconlon Reservoir	Yes	Both the reservoirs will be isolated and allow to drain down by gravity into the network. The remainder of the water at the bottom of the tanks will be collected via the scour point and Bauer connection, dechlorinated and tankered away.
Windy Gap BPT	Yes	There is a dedicated scour line and a scour extraction point fitted with a Bauer connection. The tank will be isolated and allowed to

Site	Scour required	Discharge Method
		drain down by gravity into the network. The remainder of the treated water will be collected via the scour point and Bauer connection, dechlorinated and tankered away.
Lough Talt WTP	Yes	The new reservoir will be isolated and allowed to drain down into the network by gravity. The remainder of the water will be collected via the scour point and Bauer connection, dechlorinated and tankered away. The repurposed reservoir does not have an existing scour line. A new scour point will be cored at the base of the tank to allow a Bauer connection, which will be then collected, dechlorinated and tankered away.

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, Chapter 8 – Agronomy and Chapter 10 – Water (Hydrology and Hydrogeology).

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.

3.10 Decommissioning

The Proposed Development will deliver regionally important strategic infrastructure. For the purpose of this EIAR, the target year design of new or upgraded elements is up to 50 years, however, considering that the Proposed Development will be essential for continued safe and secure water supply for the population of Mayo and Sligo, there is no plan to decommission these structures, and Uisce Éireann is committed to maintaining and repairing them into the future.

3.11 Programme

A Preliminary Programme is shown in Table 3-16 to give high level timelines. Total project duration (including design, development and review as well as pipeline final road reinstatement) is anticipated to be 35 months.

Table 3-16 – Preliminary programme for the Proposed Development

Element	Y1 2027				Y2 2028				Y3 2029				Y4 2030	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Design, development and review														
Construction														
Cessation of abstraction at Lough Talt														
Pipeline Final Road Reinstatement														

3.11.1 Road Construction Schedule

Preliminary discussions were held with both Mayo and Sligo County Councils regarding the specific requirements for road reinstatement post construction works. Both entities agreed that the road reinstatement will be carried out as per the Guidelines for Managing Opening in Public Roads, Revision 1, April 2017. Further discussions will be held with the Local Roads Authorities once a T2 Road Opening Application is submitted for the Main Works.

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3.12 References

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