LIMERICK WWTP UPGRADE AND REGIONAL BIORESOURCE CENTRE

APPENDIX 9.1 – ENERGY & CLIMATE STATEMENT

June 2026

Formerly JB Barry Partners who became part of Egis in 2023

LIMERICK WWTP AND REGIONAL BIORESOURCE CENTRE PROJECT CLIMATE IMPACTS

This technical note provides an overview of the key process elements of the Limerick (Bunlicky) WWTP Upgrade and Regional Bioresource Centre and explains their implications for operational energy demand, renewable energy recovery and greenhouse gas emissions. The note is intended to support the climate assessment presented in the EIAR.

Construction Stage Climate Impacts

During the construction phase, the Proposed Development will generate greenhouse gas (GHG) emissions, principally carbon dioxide (CO_2), arising from the combustion of fossil fuels by construction plant, non-road mobile machinery, and construction traffic, as well as from the embodied carbon of construction materials. The main construction activities associated with the Proposed Development include the installation of the AGS tank and the stormwater storage tank. Emissions will therefore be largely associated with earthworks, concrete pours, steel fabrication and installation, and associated vehicle movements.

Construction-stage emissions will result in a temporary and localised increase in GHG emissions; however, these impacts are time-limited and represent a relatively small proportion of the overall lifecycle emissions of the Proposed Development. The management of construction-related emissions will be undertaken in accordance with the principles of sustainable construction and climate mitigation set out in national policy, including the Climate Action and Low Carbon Development Act 2015 (as amended) and Ireland's Climate Action Plan.

The appointed contractor will be required to minimise construction-related CO_2 emissions through best-practice construction management. Measures will include efficient programming of works, consolidation of deliveries associated with tank construction, optimisation of haul routes, and the use of modern, fuel-efficient plant compliant with current emissions standards. Where practicable, electrically powered or hybrid equipment will be used in preference to diesel-powered plant, and temporary site power will be sourced from the electricity grid rather than diesel generators, consistent with national objectives to reduce fossil fuel consumption and emissions intensity.

Given that the two tanks represent the most material-intensive elements of the scheme, embodied carbon will be reduced where practicable through the specification of optimised concrete mixes, responsible sourcing of steel, and the reuse of excavated materials on site in accordance with the Site Waste Management Plan. These measures align with circular economy principles and will reduce both material-related and transport-related CO_2 emissions, consistent with the objectives of the Waste Action Plan for a Circular Economy.

Construction energy use and fuel consumption will be monitored and recorded through the Construction Environmental Management Plan (CEMP), enabling identification of inefficiencies and implementation of corrective actions. With these measures in place, construction-stage climate impacts will be reduced as far as reasonably practicable and are not considered significant in the context of the overall project lifecycle.

Operational Stage Climate Impacts

During operation, the Limerick (Bunlicky) Wastewater Treatment Plant (WWTP) will give rise to both direct and indirect greenhouse gas (GHG) emissions. Direct emissions will be associated with biological wastewater and sludge treatment processes, principally carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Indirect emissions will arise from electricity and heat demand supplied from the national grid. These emissions contribute to climate change at a global scale and are long-term in nature.

The upgraded facility has been designed to minimise operational energy demand and associated emissions through a combination of energy-efficient process selection, advanced monitoring and control systems, and maximised on-site renewable energy recovery. The introduction of a new Aerobic Granular Sludge (AGS)

process stream, operating in parallel with the existing activated sludge process, will reduce aeration energy demand through improved settling characteristics and shorter aeration cycles, thereby lowering electricity consumption per unit of wastewater treated and reducing associated indirect CO_2 emissions. This approach supports national climate mitigation objectives and aligns with the principles of energy efficiency set out in Ireland's Climate Action Plan.

A key element of the operational energy and carbon reduction strategy is the development of the Regional Bioresource Centre incorporating a Thermal Hydrolysis Process (THP) upstream of anaerobic digestion. This approach is consistent with the sustainability, energy recovery, and resource-efficiency objectives of Uisce Éireann's National Wastewater Sludge Management Plan (NWSMP). THP is recognised as best available practice for advanced sludge treatment and increases volatile solids destruction during anaerobic digestion, resulting in increased biogas production and improved energy recovery.

An additional 800 kW combined heat and power (CHP) unit will be installed as part of the upgrade to utilise the increased biogas production for on-site use, thereby reducing reliance on imported grid electricity. Increased biogas storage capacity will provide operational buffering, optimise CHP utilisation, and reduce the need for gas flaring. These measures support Ireland's renewable energy and decarbonisation targets under the Climate Action and Low Carbon Development Act. The proposed energy recovery infrastructure, including the Combined Heat and Power (CHP) unit, is an ancillary process component intended to facilitate the plant's transition toward energy neutrality. In accordance with the phased targets established under Article 11 of the Recast Urban Waste Water Treatment Directive (rUWWTD), this equipment allows for the beneficial onsite recovery of biogas to offset a significant portion of the facility's power and thermal requirements.

Daily sludge deliveries to the RBC will increase slightly from approximately 10 to 14 loads per day over the 10-year design horizon. This approach aligns with the objectives of Uisce Éireann's National Wastewater Sludge Management Plan to centralise treatment and reduce the transport of liquid sludge across the wider region. The combined treatment of imported and indigenous sludge will increase biosolids exports from approximately 1 to 7 loads per day. However, the introduction of THP improves digestion efficiency and reduces the volume of biosolids produced compared with a conventional anaerobic digestion process.

The production of Class A biosolids is a beneficial reuse of sewage sludge, which is in accordance with regulatory requirements and supports circular economy objectives. This reduces reliance on synthetic fertiliser production, contributing to a lower carbon footprint for sludge management.

Operational energy demand at the upgraded Limerick WWTP will be largely offset through on-site renewable energy generation associated with the Regional Bioresource Centre. The total operational energy consumption of the facility is estimated at approximately 23,578 kWh/day (8,606,246 kWh/annum). Biogas production from the Regional Bioresource Centre, incorporating Advanced Anaerobic Digestion (AD), is forecast at approximately 11,216 Nm^3/day, providing an electrical generation potential of around 24,021 kWh/day (8,768,000 kWh/annum). Therefore, the upgraded plant is expected to become largely self-sufficient, with only minimal reliance on imported grid electricity.

In addition to climate change mitigation, the proposed development contributes to climate change resilience in relation to stormwater management and the ability to respond to extreme rainfall events. The provision of 12,500 m^3 of stormwater storage at Corcanree Pumping Station will moderate peak flows to the WWTP during heavy rainfall events, reducing the risk of overloading the treatment plant and reducing storm overflows from the current average 213 events per year to an average 20 events per year. This will improve the resilience of the wastewater network and aligns with national climate adaptation objectives set out in the National Adaptation Framework and the Water Quality and Water Services Infrastructure Sectoral Adaptation Plan.

Section 15 Climate Action and Low Carbon Development Act

This section mandates that all public bodies perform their functions in a manner consistent with approved climate action plans and national climate objectives, in so far as practicable.

The Proposed Development has been assessed considering both a Greenhouse Gas Emissions Assessment and a Climate Change Vulnerability Assessment, which together demonstrate alignment with the most recent national climate action plan, long-term strategy, and adaptation frameworks. The Proposed Development is consistent with the obligations set out in Section 15 of the 2015 Act (as amended) as it adheres to the latest climate action plan and national climate objectives.

Conclusion

The Proposed Development incorporates a range of measures to manage energy use and reduce greenhouse gas emissions during both the construction and operational phases. During construction, temporary greenhouse gas emissions associated with plant, materials and transport will be minimised through best-practice construction management, efficient use of materials, and reduced fuel consumption.

During operation, carbon intensity will be reduced through energy-efficient treatment processes and the recovery and use of renewable energy generated on site. The integration of Thermal Hydrolysis and advanced anaerobic digestion will increase biogas production, which will be used in combined heat and power units to offset plant energy demand and reduce reliance on imported grid electricity and fossil fuels. The production of Class A biosolids will also support beneficial reuse and nutrient recycling, contributing to a lower overall carbon footprint for sludge management.

The provision of 12,500 m^3 of stormwater storage at Corcanree Pumping Station will improve the resilience of the wastewater network against more frequent and intense rainfall events. Overall, the Proposed Development supports the objectives of Uisce Éireann's National Wastewater Sludge Management Plan and national climate policy by contributing to a low-carbon, climate-resilient wastewater treatment system.

The Proposed Development is considered to be consistent with the requirements of Section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended). The assessment confirms that the Proposed Development contributes to the achievement of national climate objectives by minimising greenhouse gas emissions where practicable and incorporating measures to enhance resilience to climate change. Accordingly, the development supports the transition to a low-carbon and climate-resilient future in line with statutory obligations.

Ireland

www.egis-group.com