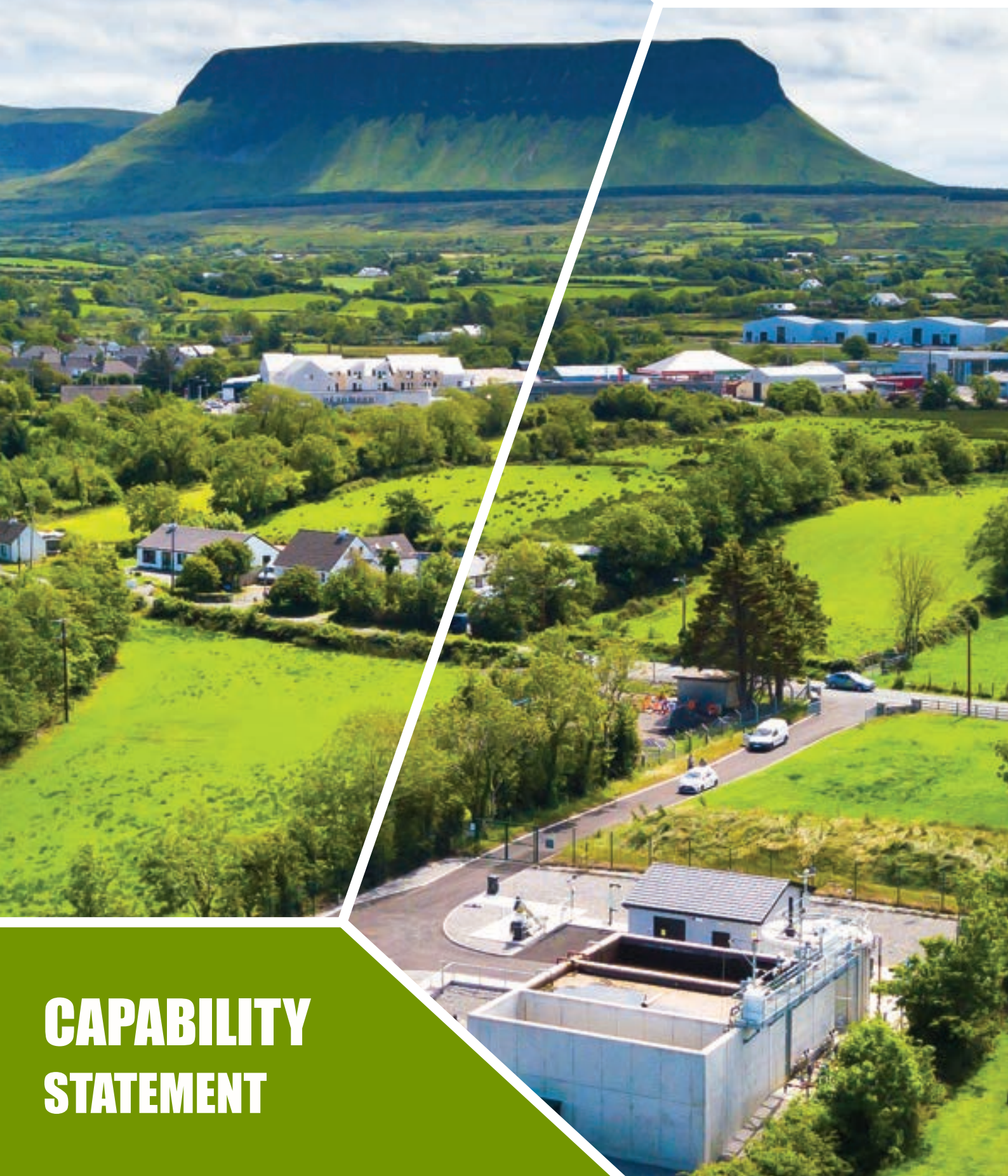




**NICHOLAS  
O'DWYER**  
an RSK company

# WASTEWATER SECTOR



## CAPABILITY STATEMENT



## Wastewater Sector Capability Statement

Effective Wastewater treatment is key to public health. It involves maintaining a delicate balance between nature's own methods and technical intervention. To get it right, requires a mix of experience, expertise, and flexibility that only decades of engineering practice can instil. With over 2.7 billion people predicted to be without basic sanitation in the next few years and many nations facing even higher demands, wastewater treatment is set to continue as a major driver of all world economies.



Nicholas O'Dwyer implements and maintains a management system which fulfills the requirements of the standard IQNET ISO 9001:2015  
Registration Number: IE-19.3077HQ



**NSAI**

Certificate of Registration  
of Occupational Health and Safety  
Management System to  
I.S. ISO 45001:2018



**NSAI**

Certificate of Registration  
of Environmental Management  
System to I.S. EN ISO 14001:2015



**NSAI**

Certificate of Registration  
of Quality Management System  
to I.S. EN ISO 9001:2015



# Wastewater Sector

## Capability Statement

Nicholas O'Dwyer has successfully delivered wastewater infrastructure projects across the global economy for over 90 years. Counting all of the International funding agencies amongst their client base, they have been at the forefront of many of the major infrastructural projects throughout the developing world. As leaders in innovative design and strategic management of such projects, the firm continues to match the latest technologies and industry developments and trends to provide the right solution for wastewater collection and sustainable treatment.

The firm's European and International clients include local and multi-national contractors, government departments, statutory bodies, private sector organisations, utility providers and International Funding Institutions (IFIs) responsible for funding and coordinating major infrastructure projects.

Over the decades, the firm has built strong connections to the best engineering firms worldwide, positioning itself to combine its international expertise with local knowledge and experience.

Working together, Nicholas O'Dwyer and its partners provide the most effective solutions resulting from a true understanding of the client's brief.

Since its foundation Nicholas O'Dwyer has delivered hundreds of water, civil, transport, and environmental projects in more than 50 countries.

### *During the past 15 years alone it has:*

- *Provided services in water/wastewater engineering to authorities serving over 5 million consumers;*
- *Provided engineering services to sanitation sector projects with a construction value of over €1 billion;*
- *Provided over a million man-hours of engineering services to the water industry;*
- *Worked in over 20 countries throughout the developing world;*
- *Developed a strong track record in the delivery of projects funded by IFI's.*

Extensively used, and is familiar with, the conditions of contract of these agencies and with the FIDIC conditions. Its team prides itself on a 'can do' approach delivered through sound management, technical excellence and teamwork.

***“Has successfully delivered wastewater infrastructure projects across the global economy for over 90 years”***





# Wastewater Sector

## Our Service

Nicholas O'Dwyer is a full service engineering firm providing planning, design and implementation of innovative and affordable solutions in sanitation. Keeping abreast of all regulatory requirements, the firm is best-placed to deliver projects that adhere to the increasingly stringent regulations in the sector that ensure all wastewater is treated in an environmentally sustainable manner. The firm has established best practices in the areas of:

### Strategic Planning

Assisting clients in planning and managing urban, peri-urban and regional sanitation schemes, Nicholas O'Dwyer provides services relating to catchment hydraulics; energy efficient and sustainable urban drainage.

### Urban Drainage

The team provides comprehensive services across a wide range of different types of collection systems. This encompasses all elements of the collection system from sanitary collections points to the large-scale wastewater transfer pipelines; and includes gravity sewers, pressure sewers, and pump stations, for both wastewater and surface water.

### Municipal Wastewater Treatment Plants

Our engineers and environmental consultants prepare studies and develop efficient designs for wastewater treatment plants, from village scale to municipal scale. Our services include influent quality analysis; assessment of treatment systems; development and monitoring of pilot plants; design of treatment facilities, including process, civil, building, mechanical and electrical systems engineering.

### Industrial Wastewater Treatment Plants

Our services include influent quality analysis, nutrient analysis, co-treatment analysis, assessment of treatment systems for high strength loads, development and monitoring pilot plants to assess treatability, design of treatment facilities, including process, civil, building and, mechanical and electrical systems engineering.

### Sludge

This by-product of wastewater treatment needs careful management, and requires significant planning for long term sustainability. Nicholas O'Dwyer's services include sludge quality analysis, nutrient analysis, energy recovery, sludge treatment and beneficial re-use analysis.

### Alternative Technologies

Nicholas O'Dwyer strive to use the most appropriate technology for any particular scenario, and its engineers can advise on the optimum solution in relation to collection and treatment process technologies.

### Infrastructure Management

The firm provides all aspects of wastewater management advisory and consultancy services to utility companies. It has implemented water usage studies, operation efficiency studies, energy efficiency studies, pollutant source studies, metering and billing projects, institutional strengthening, and capacity building initiatives.

### *The team's range of engineering and technical services include:*

- *Master planning;*
- *Technical and economic feasibility studies;*
- *Environmental impact assessments;*
- *Project development planning;*
- *Design;*
- *Risk management assessment;*
- *Optioneering of alternative designs;*
- *Conceptual and detailed designs and documents quality management;*
- *Water quality monitoring;*
- *Training and capacity building;*
- *Operational monitoring.*

***"Delivers the technical and organisational expertise to engineer innovative and affordable solutions in sanitation"***



# Wastewater Sector

## Our Approach

At Nicholas O'Dwyer we understand wastewater, and in particular, how to treat it; we understand how the treatment processes work and why sanitation is a fundamental contributor to the sustainable well-being of any society around the world.

We understand what it takes to deliver a sanitation project in the most arid conditions and in the wettest and we apply that skill to every project we undertake to ensure that you receive the best solution to meet your needs.

Most importantly we build relationships that work for you. It is this partnership with you the Client and all members of the supply chain that ensures you benefit from the very best expertise across all disciplines.

With over 90 years experience in wastewater project management, we strictly adhere to schedules throughout the process and consistently bring projects in on time and in budget.

### *Our approach stems from our belief that:*

- *Complexity should be simplified;*
- *Wastewater Infrastructure Projects are not simple, but we know how to manage the complexities to deliver results;*
- *Value for Money is critical. That's why we aim to do more with less – we use the latest information and process technology and data analytics to deliver better performance with less of your resources;*
- *Encouraging our staff to excel in all that they do benefits the project, benefits you and benefits us.*

***“Sanitation is a fundamental contributor to the successful functioning of any society”***





# CASE STUDIES





# CORK LOWER HARBOUR MAIN DRAINAGE SCHEME

## Cork, Ireland

The Cork Lower Harbour Main Drainage Scheme (Cork LHMDS) serves the population/industrial centres of Cobh, Carrigaline, Crosshaven, Passage West, Monkstown, Glenbrook, Ringaskiddy, Shanbally, and Coolmore. The existing sewer network serving the Lower Cork Harbour area comprises mainly combined sewer systems. Wastewater from Cobh, Carrigaline, Passage West/Monkstown, and Ringaskiddy previously discharged following preliminary screening or untreated into the Harbour.

It was proposed to transfer wastewater from the Cork Lower Harbour to a new 80,000pe (Full Treatment Capacity of 54,000m<sup>3</sup>/d) wastewater treatment plant site at Carrigaline. The final effluent will be discharged to Cork Harbour via an existing submerged outfall. The scheme includes the construction of eight main pumping stations and approximately 57km of new/upgraded sewers (ranging from 225mm to 1,050mm), rehabilitation of existing trunk sewers and surface water separation where economically viable. A 1km section linking Cobh and Monkstown will be constructed by tunnelling underneath the Lee Estuary.

Design-build works commenced in August 2015. Project delivery featured several very particular constraints including working in proximity to high and medium voltage power lines, works in proximity to gas transmission mains, trunk watermain crossings, works in Special Areas of Conservation (SACs) and Special Protection Areas, areas of archaeological interest and traffic management nearby to a very busy and strategically important industrial estate at Ringaskiddy.

Whilst a two-year design build period existed for the works, the Contractor was required to turn flows live by the end of December 2016 to meet obligations at EU level, which necessitated the delivery of a complex treatment process using innovative technology on a green field site in under 18 months from commencement.

Adoption of new and innovative technology at tender stage, the DBO Contractor proposed the use of new and innovative technology comprising the Nereda® process. This process involves the harnessing of granular biomass in highly automated sequencing batch reactors resulting in reduced footprint, costs, electricity, sludge production and improved chemical consumption.

At design-build stage, very close coordination in terms of design review and interface with the process specialists was required of Nicholas O'Dwyer to ensure that the particular contract constraints could be met. The reduced footprint deriving from such technology played an important part in ensuring the live flows deadline of December 2016 was met.



***“The Cork Lower Harbour Main Drainage Project was named Engineering Endeavour of 2021, by Engineers Ireland”***

### KUTAHYA WwTP

#### Kutahya, Turkey

Nicholas O'Dwyer provided contract management and construction supervision for the upgrade to the existing wastewater treatment plant servicing Kutahya, Turkey. The original plant had a design capacity of 202,000pe with a maximum hydraulic capacity of 4,428m<sup>3</sup>/hr.

Due to operational issues with the mechanical and electrical components the process was not capable of achieving the required effluent standards and was in immediate need of upgrade and modernisation.

The new Kütahya Wastewater Treatment Plant is designed and constructed as a Biological Nutrient Removal (BNR) activated sludge plant with anaerobic stabilisation of sludge generated in the activated sludge tanks. Carbon, phosphorus, and nitrogen removal is accomplished in the process using a combination of biological and chemical means.

The first stage of the treatment plant is designed to serve a population equivalent of up to 358,850pe in 2030 with the second stage serving up to 434,867pe in 2045.

The contract was managed in accordance with FIDIC Conditions of Contract (Yellow Book) with all designs and submission requiring prior approval of the Engineer before commencement of construction on site.

Nicholas O'Dwyer, acting as the Engineer under the contract, were responsible for review and approval of all designs and submissions prepared by the Contractor in executing the works. This included all civil, structural, process, mechanical, and electrical submissions.

The construction supervision team was comprised of a mixture of local and international experts and a Team Leader responsible for coordination of all aspects of the project.

Nicholas O'Dwyer were also responsible for delivering Technical Assistance and Capacity Building programmes for the Water Utility Department (WUD) and the Project Implementation Unit (PIU) within the Municipality.

***“The project is part of a wider programme to enable Turkey to achieve a high level of environmental protection and compliance with the EU wastewater sector directives”***





# LEIXLIP WwTP UPGRADE AND EXPANSION

Kildare, Ireland

Nicholas O'Dwyer provided technical assistance for this project in overall planning and phasing of the scheme, environmental impact assessment, procurement options, expansion and treatment options, and procurements of the project.

The project involves major improvements to the sewerage system (50km) in the Lower Liffey Valley Region. Extensions and remediation works have been undertaken at five Towns in the area, the existing collection system in the town of Straffan was upgraded and connected via a new rising main to the expanded system, and it is proposed to increase the capacity of the Leixlip Wastewater Treatment Plant from 80,000pe to 150,000pe (Full Treatment Capacity 101,250m<sup>3</sup>/d).

The design included the re-use of existing infrastructure, and provision of further aeration and settling stages, and the provision of sludge thickening, anaerobic sludge digestion and sludge dewatering facilities, and odour control facilities.

As well as domestic effluent, there is a large industrial contribution to the wastewater treatment plant, including a major wastewater contributor to the works that required a considerable increase in capacity at the treatment plant in order to “ramp-up” production at their facility.

This contributor is of national economic importance. During the detailed design stage, there was extensive liaison with the contributor in order to quantify their capacity requirements at various time during the construction project.

In this way, sectional completion milestones were built into the contract requirements by Nicholas O'Dwyer to ensure that production could be maintained at their facility at the required times.

***“Liaison was also maintained with the major industrial contributor on a weekly basis, in order to communicate any acceleration or delay in their requirements for increased capacity”***



### LUSAKA PIPELINES

#### Lusaka, Zambia

The Lusaka Sanitation Program aims to increase access to sustainable sanitation services to Lusaka's residents, especially the urban poor and to strengthen Lusaka Water and Sewerage Company's (LWSC) capacity to manage sanitation services. The program aims to address one of Zambia's most binding constraints to economic growth through infrastructure investment in Lusaka, the rapidly urbanizing capital.

The objective of the project is to upgrade and expand sewerage systems in the Ngwerere and Manchinci sewer sheds.

**Collection system upgrading and expansion includes the following:**

- *Sewer network expansion in Emmasdale and Chaisa neighbourhoods involves the installation of the new sewer network estimated at over 18km with varying pipes materials and diameters;*
- *Sewer network expansion along Kafue Road involves the installation of about 10km of sewer network and 3 pump stations;*

- *Upgrade of Ngwerere Western Interceptor involves the construction of over 4km of sewer interceptor with varying pipe diameters and materials, and trenchless construction technology (pipe jacking) used across tarred roadways.*

The services provided by Nicholas O'Dwyer under this project are to provide contract administration and construction supervision of sewerage works of year 1 investments under the Lusaka Sanitation Project.

The expected duration of the assignment is approximately 24 months (inclusive of a 12 months defects liability period).

The Project area is 112ha in the South West of Lusaka.

***“Collection system upgrading and expansion is based on priority 1 investments as identified in the Lusaka sanitation master plan by LWSC, funded by the World Bank”***





### KINOYA SEA OUTFALL PIPELINE

#### Suva City, Fiji Islands

A new effluent outfall was required at Kinoya Sewage Treatment Plant, near Suva City, Fiji. The outfall was to be designed to cater for phased discharge increases as the population equivalent moves from 90,000 to 360,000. Nicholas O'Dwyer carried out all the preliminary design, environmental impact assessment, detailed design and construction supervision for this 2,000m long sea outfall.

In order to complete the initial part of this project, Nicholas O'Dwyer needed to determine the optimum outfall alignment and end point. Nicholas O'Dwyer carried out detailed Hydrographic Surveys to examine the sea bed in the area, followed by mathematical dispersion modelling to rank various location options in relation to the treated effluent plume and its dispersion in the surrounding environment.

Fiji is world renowned for its sensitive coral reefs and consequently, detailed Environmental studies were required in order to ensure that there was no significant impact on the local ecosystems.

After the preliminary stage, Nicholas O'Dwyer carried out all the detailed design for the project including the hydraulic design of the outfall and the civil structural analysis and design. Detailed cost estimates were calculated based on quantity calculations and comprehensive tender documents were prepared. During the Tender Period, Nicholas O'Dwyer provided assistance to the client with tender procedures, tender evaluation and the contract negotiations.

The works comprised the installation of a main outfall made of 1,400mm diameter HDPE pipeline (submerged below the seabed over a length of 1,800m), the installation of 80 pipeline diffusers, concrete chambers, anchor blocks and other ancillary equipment.

Nicholas O'Dwyer provided construction supervision including performance monitoring, progress reporting, claims management, general financial control, final account certification, and detailed works inspection before successful acceptance.

***“The outfall is designed to cater for phased discharge increases as the population equivalent moves from 90,000 to 360,000”***





### GALWAY MAIN DRAINAGE

#### Galway, Ireland

Galway City is the third largest city in Ireland. Galway City, and adjacent areas of Galway County, have experienced significant population growth which led to concerns regarding the adequacy of the infrastructural provision. Nicholas O'Dwyer and Entec, in association, were appointed to carry out a detailed examination of the wastewater infrastructure.

The entire drainage network of the City was camera surveyed and all manhole locations and interconnections were established. A Flow and Rainfall Survey was carried out to provide real data for verification of the hydraulic model built by Entec. This model enabled optimisation of the network performance particularly in relation to limiting Combined Storm Overflow (CSO) spills and the consequent pollution.

The treatment plant site at Mutton Island is surrounded by a wave wall, which set tight horizontal and vertical constraints in relation to any possible upgrade.

Nicholas O'Dwyer put forward proposals to substantially increase the capacity of the plant, from 91,000pe to 170,000pe, based on the output from a process model, by modifying hydraulic bottle necks within the system and modifying the biological processes.

Additionally, the sludge line was modified to include proposals for a compact sludge drier on site to substantially reduce the volumes of sludge leaving the island.

The Environmental Impact Statement (EIS) for the upgrade of Mutton Island WwTW was a large scale task involving water quality, odour and noise modelling; visual and landscape assessments and various ecological and sociological surveys. All of these combined into the EIS ensuring the ongoing protection of Galway Bay.

***“Nicholas O'Dwyer put forward proposals to substantially increase the capacity of the plant, from 91,000pe to 170,000pe”***





# CAVAN WASTEWATER TREATMENT PLANT

Cavan, Ireland

Cavan is located in the north of the Republic of Ireland. The Cavan Sewerage Improvement Scheme provides for the immediate and long term improvement and expansion of the existing scheme of collection, treatment and disposal of wastewater generated from the town and its surrounds. The collection network is a system comprising foul and storm sewers. Surcharging and flooding occur in several areas under normal rainfall conditions each year.

The scheme involves the upgrade and expansion of the Wastewater Treatment Works on a phased basis (to 54,000pe); the upgrade and remediation of the existing drainage network and pumping stations; improvements to the existing foul and storm water system, including repair and rehabilitation to pipelines and provision of increased pumping and storage capacity at pumping stations. The overall project value is €30,700,000.

The project area is in difficult undulating terrain, and also included a leachate treatment facility. Nicholas O'Dwyer have provided technical assistance in relation to feasibility studies, preliminary design, energy efficiency, sludge management, detailed design, tender documents, and construction supervision.

***“Overall project value €30,700,000”***



# LETTERKENNY SEWERAGE SCHEME

## Donegal, Ireland

Letterkenny Sewerage Scheme comprises the upgrading and expansion of the drainage network and the provision of a new 40,000pe wastewater treatment plant, sludge hub centre and associated works. The network included for the provision of 8km of new and upgraded pipeline within the town.

The scheme also included the design by Nicholas O'Dwyer of 22km of pipelines with diameters ranging from 225mm to 375 mm. Construction of 6km of the network, consisting of up to 1,200mm diameter trunk sewer was completed in 2007, supervised by Nicholas O'Dwyer.

The work carried out by Nicholas O'Dwyer included preparation of documentation and reports as required including Preliminary Contracts (including, topographical surveys, site investigation and flow and load contracts), Design Build Operate (DBO) Contract Documents, Water Services Pricing Policy Report, Public Private Partnership (PPP) Assessment Report, and preparation of an Environmental Impact Statement for the wastewater treatment plant and sludge hub centre.

Services provided by Nicholas O'Dwyer for the sewer network contract included for preparation of feasibility studies, network surveys (including CCTV, SUS, flow and rainfall), preparation of a Network Model and procurement of the network contract under a traditional contract. The procurement of the network contract included detailed design and preparation of tender documents, Tender Assessment and Report on Tenders and Supervision of Construction.

Nicholas O'Dwyer provided technical assistance for the procurement of the scheme including Prequalification, Tender Assessment and Recommendation. The scheme included a 40,000pe wastewater treatment plant on the site of the existing WwTP, outfall to Lough Swilly, outlying storm tanks and pumping station, Sludge Hub Centre including imported sludge acceptance.

***“Upgrading and expansion of the drainage network and the provision of a new 40,000pe wastewater treatment plant, sludge hub centre and associated works”***





# DOCKLANDS RISING MAINS AND ARTERIAL SEWER TUNNEL

Dublin, Ireland

Dublin City Council procured Nicholas O'Dwyer to act as specialists in relation to the design and provision of 3.5km of twin 500mm dia. Rising mains, along with supervision of the design and construction of a 250,000 pe pumping station. Nicholas O'Dwyer provided all services from preliminary design (route selection) to detailed design/tender documents to construction supervision

In addition, the project also included a separate contract for the construction of a large arterial sewer, comprising 570m of 1,800mm diameter foul gravity sewer along Sheriff Street Upper and approximately 300m of 600mm diameter foul gravity sewer along Castleforbes Road using trenchless construction methods (micro-tunnelling).

This also included construction of four drive shafts, two reception shafts and an inter-connecting shaft on busy urban streets, and accommodation works for the diversion of major utilities.

The work was carried out in highly urbanised areas with high traffic, population, and service densities. Nicholas O'Dwyer provided all services from route selection to design to construction supervision.

Part of the project entailed a review of the existing network model of the area to optimise the performance of the system to allow for future development in the area in a phased manner and the elimination of flooding.

The project also involved the installation of the mains within a 2.5m tunnel under the River Liffey. As part of the work, Nicholas O'Dwyer also designed and installed water mains and district heating pipes in the 260m long tunnel.

***“The Dublin Docklands Development area comprises of 520 hectares or 1300 acres of land on the north and south banks of the river Liffey”***



# JIGJIGA AND DEGAHBUR TOWNS WASTEWATER

## Ethiopia

The project is to conduct thorough review of Jigjiga and Degahbur town situation assessment study report and other pertinent documents.

The project required us to undertake in-depth assessment of the current sanitation situation and existing plan with respect to liquid waste, solid waste, and urban drainage including the institutional arrangement, infrastructures, existing structure policies, strategies, strategic development plans at national, region, and towns' levels and developing an appropriate institutional framework and action plan covering wastewater, and other facilities used for sanitation / sewerage services provision and management.

Develop indicative plan for sanitation (solid , wastewater and urban drainage) for each town.

To conduct feasibility and detail design of appropriate town wide inclusive sanitation/wastewater management infrastructure, and recommend commensurate management system (financial and business arrangement, regulatory framework, and customer-oriented programs) for the project towns.

### *Description of actual services provided by staff within the assignment:*

- *Inception Report;*
- *Task I Report (Assessment of existing sanitation situation and infrastructure works);*
- *Task II Report (Feasibility and detail design of the new proposed systems);*
- *ArcGIS Database;*
- *Bid Documents;*
- *Zonal (where applicable) hydrological data analysis;*
- *Detailed geotechnical and topographic surveys report;*
- *Detailed business plan.*

***“In Ethiopia, 60 to 80 percent of communicable diseases are attributed to limited access to safe water and inadequate sanitation and hygiene services”***





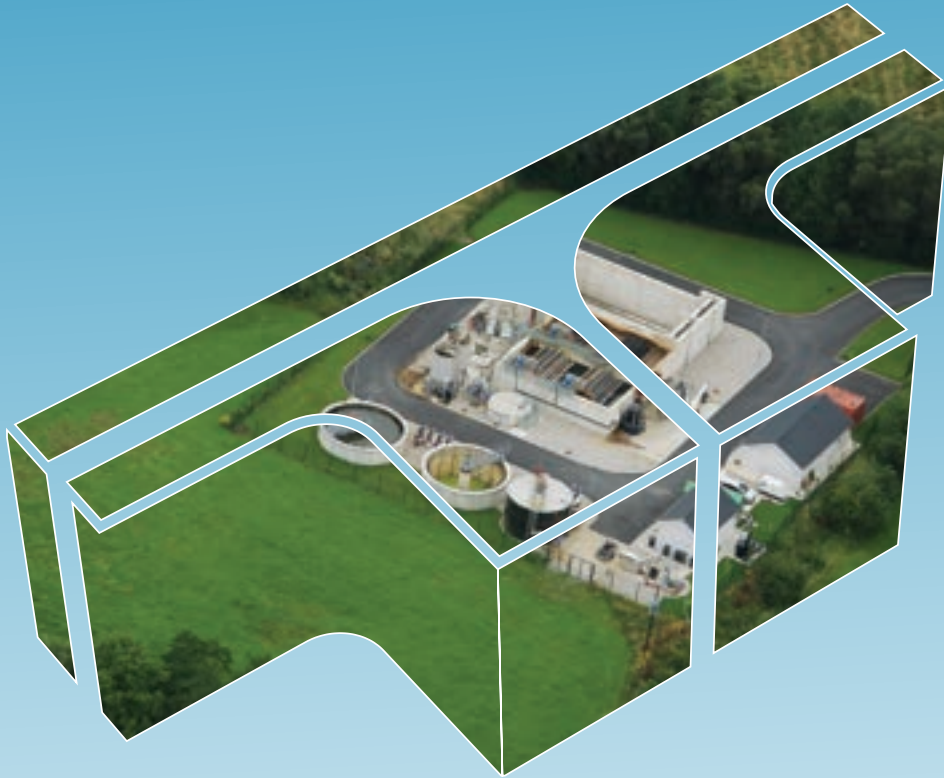
## Wastewater Sector

### *Sample Client List*

Dublin Airport Authority;  
Department for Regional Development, Northern Ireland;  
Department of the Environment, Community & Local Government, Ireland;  
Environmental Protection Agency Ireland;  
European Union;  
Irish Aid;  
Irish Water;  
Millennium Challenge Account - Jordan;  
Millennium Challenge Account - Tanzania;  
Ministry of Energy and Water, Zambia;  
Ministry of Minerals, Energy and Water Resources, Botswana;  
Ministry of Water and Irrigation, Jordan;  
Ministry of Water Resources and Development, Zimbabwe;  
Ministry of Works and Energy, Fiji;  
Presidency of Meteorology and Environment, Kingdom of Saudi Arabia;  
Various Local Authorities in Ireland;  
Water Services National Training Group, Ireland;  
Yorkshire Water, Severn Trent Water, UK.



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FOR YOUR NEEDS

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