Tionscadal Soláthair Uisce
Water Supply Project

Environmental Impact Assessment Report (EIAR)

Volume 1 of 6: Non-Technical Summary

Document no: 32105801/EIAR/NTS
Version: Final

December 2025

Uisce Éireann
Irish Water

Jacobs

TOBIN

Contents

Acronyms and Abbreviations

Acronym	Meaning
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ESB	Electricity Supply Board
EU	European Union
GDA WRZ	Greater Dublin Area Water Resource Zone
ha	Hectares
km	Kilometre
kV	Kilovolt
m^3/s	Metres cubed per second
Ml	Megalitres
Mld	Megalitres per day
WFD	Water Framework Directive

1. Introduction

1. This document is the Non-Technical Summary of the Environmental Impact Assessment Report (EIAR) for the Water Supply Project Eastern and Midlands Region, hereafter referred to as the 'Proposed Project'. The EIAR has been prepared to accompany the planning application for the Proposed Project to the planning authority, An Coimisiún Pleanála.

2. Uisce Éireann is the 'developer/applicant' for the Proposed Project. Uisce Éireann is Ireland's national regulated water utility, responsible for the delivery of secure, safe and sustainable water services for the people of Ireland. Incorporated in July 2013 as a company under the Water Services Act 2013, Uisce Éireann brings the water and wastewater services of the 31 Local Authorities together under one national service provider.

3. The preparation of a Non-Technical Summary is a requirement under the European Union (EU) Directive on Environmental Impact Assessment (Directive 2014/52/EU, referred to as the EIA Directive). One of the fundamental objectives of the EIA Directive is to '*ensure that the public are made aware of the environmental implications of any decisions about whether to allow new projects to take place'*.

4. This document summarises in non-technical language the EIAR, including the likely significant effects which may arise during the construction and operation of the Proposed Project and measures that would be put in place to reduce or remove those effects, known as mitigation. The Environmental Impact Assessment process has been undertaken in line with the EIA Directive, based on the guidance presented in the Environmental Protection Agency's (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports and other relevant guidance.

5. Along with the EIAR, a Natura Impact Statement has been prepared in line with the requirements of the EU Habitats Directive; and a Water Status Impact Assessment Report has been prepared in line with the requirements of the EU Water Framework Directive.

2. Need for the Proposed Project

6. Safe, secure, resilient, and sustainable drinking water supplies are essential to public health, social and economic growth. With climate change and population growth there are increasing pressures on existing supplies. There is already a deficit in supplies in the Greater Dublin Area and the wider Eastern and Midlands Region and this will only increase in the future.

7. The River Liffey currently provides approximately 85% of source water to the Greater Dublin Area Water Resource Zone (GDA WRZ) and there is almost no spare capacity in the current supply. Being heavily dependent on one source for the majority of water supply in the GDA WRZ means that there is very limited resilience within the existing system.

8. In spring 2021, Irish Water (now Uisce Éireann) published the National Water Resources Plan Framework Plan. The National Water Resources Plan sets out how Uisce Éireann will balance the supply and demand for drinking water over the short, medium and long term. The 25-year strategy aims to ensure the supply of safe, sustainable, secure and reliable drinking water in Ireland.

9. The National Water Resources Plan consists of:

    - The National Water Resources Plan Framework Plan (the 'Framework Plan') which set out the approach to identifying water supply needs and quantifying those needs up to the year 2044 which, following public consultation, was finalised and adopted in spring 2021
    - Four Regional Water Resources Plans to identify the optimal technical solutions (the 'Preferred Approaches') required to address the needs outlined in the Framework Plan.

10. The Framework Plan identifies how Uisce Éireann assesses needs across water supplies and the process Uisce Éireann will use to find solutions to address those needs. The Framework Plan identified, at a national level, that a new sustainable source of water is necessary to augment supplies in the Eastern and Midlands Region to address deficits in supply, increase the reliability of the current water supply system, and support future growth now and into the future.

11. The Regional Water Resources Plan – Eastern and Midlands (the 'Eastern and Midlands Plan') is the Regional Water Resources Plan relevant to the Proposed Project. The Eastern and Midlands Plan was adopted by Uisce Éireann in autumn 2022 following public consultation, and applied the methodologies set out in the National Water Resources Plan Framework Plan to identify the water supply needs of the Eastern and Midlands Region and develop the preferred approaches to resolve them.

12. The Eastern and Midlands Plan identified that a New Shannon Source with transfers was the Preferred Approach to address the need of the GDA WRZ. Having identified the New Shannon Source as the Preferred Approach to meet the deficit in the GDA WRZ, the Eastern and Midlands Plan identified a 'Water Supply Area' (Image 2.1) consisting of additional Water Resource Zones along the length of the pipeline and also adjacent to the GDA WRZ which had a deficit that could also be met from the New Shannon Source.

13. This establishes the need for the Proposed Project as it would deliver a New Shannon Source to provide the capacity to meet the deficit in the GDA WRZ and provide for potential future connections into 18 other Water Resource Zones in the Eastern and Midlands Region (once future projects are brought forward). This would allow those 18 Water Resource Zones to be consolidated into four new Water Resource Zones. It would also facilitate the potential future supply to 17 other Water Resource Zones adjacent to the GDA WRZ through the redistribution of supply within the GDA WRZ and an expansion of the GDA WRZ by incorporating these Water Resource Zones into the GDA Regional Water Resource Zone (once future projects are brought forward). As a result, the Proposed Project aligns with, and is a significant step towards delivering, the Preferred Approach set out in the Eastern and Midlands Plan for a New Shannon Source with transfers.

14. The Proposed Project infrastructure would provide the capacity to meet the needs of a Water Supply Area consisting of 36 Water Resource Zones across the Eastern and Midlands Region. This aligns with the Eastern and Midlands Plan. It would do this by providing the capacity to supply up to 300Mld (megalitres per day) which would:

    - Immediately meet the identified need for water within the GDA WRZ to 2050 and beyond
    - Enable the future supply to 17 other Water Resource Zones by re-directing supplies within the GDA WRZ and expanding the GDA WRZ by incorporating these Water Resource Zones into the GDA Regional Water Resource Zone, when future projects are brought forward by Uisce Éireann
    - Enable the future supply to a further 18 Water Resource Zones across the Midlands from take-off points along the pipeline and facilitate the consolidation of those Water Resource Zones into four new Water Resource Zones, when future projects are brought forward by Uisce Éireann
    - Make provision for potential reductions in existing supply volumes due to sustainability requirements anticipated under the new abstraction licensing regime.

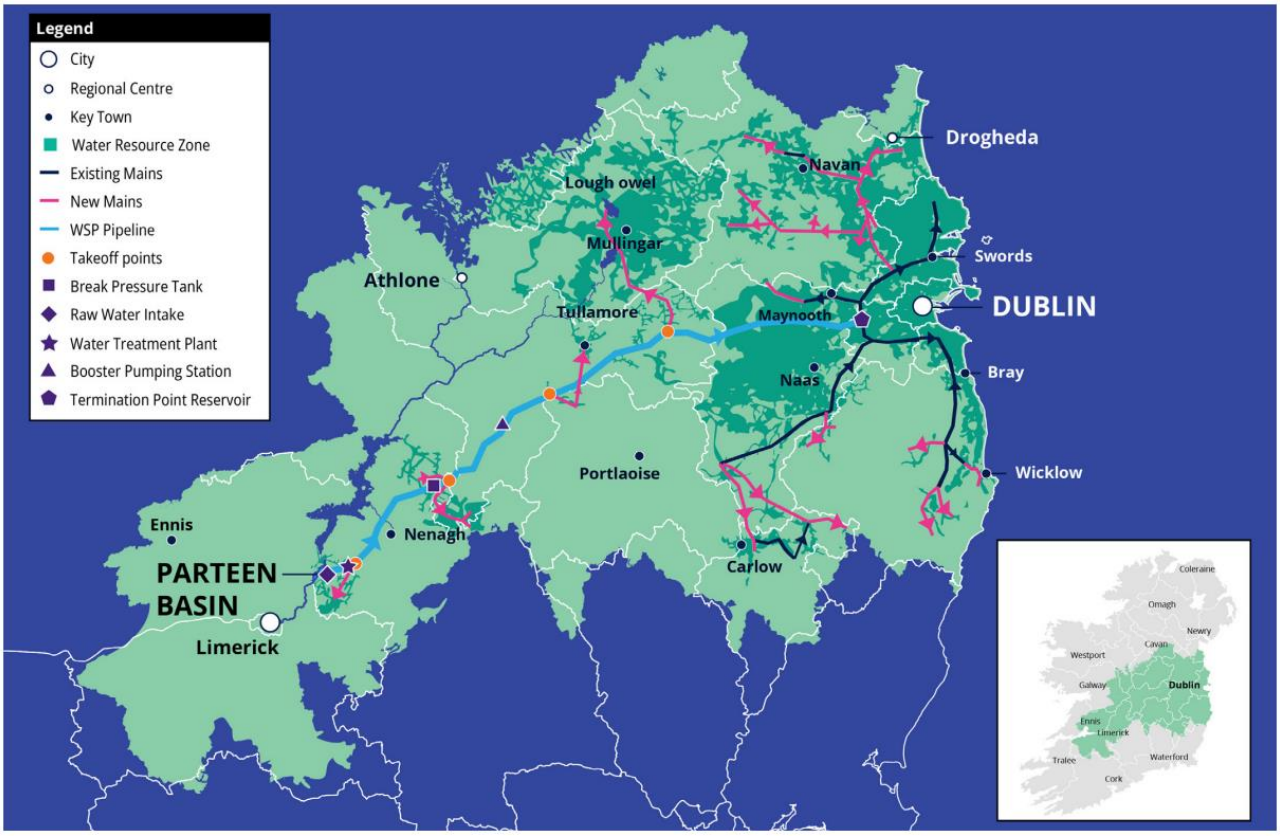

Image 2.1: Overview of the Water Supply Area

15. The aims of the Proposed Project are to:

    - Provide a sustainable water supply from a New Shannon Source
    - Address critical supply issues in the Greater Dublin Area with provision for future supplies to multiple Water Resource Zones in the region
    - Increase resilience of supplies and Levels of Service (the reliability of the supply that Uisce Éireann customers can expect to receive)
    - Deliver a flexible, future-proofed solution that is responsive to change.

3. The Proposed Project

3.1 Overview

16. The Proposed Project would provide a new supply to address the projected need for drinking water and increase the reliability of supplies in the Eastern and Midlands Region. The Proposed Project consists of an abstraction of raw water from Parteen Basin on the Lower River Shannon in County Tipperary, a new 172 kilometre (km) pipeline, six associated Infrastructure Sites, and other ancillary infrastructure, such as valves, to treat the raw water to drinking water standard and transfer it to a new reservoir at Peamount in County Dublin. This is shown in Image 3.1.

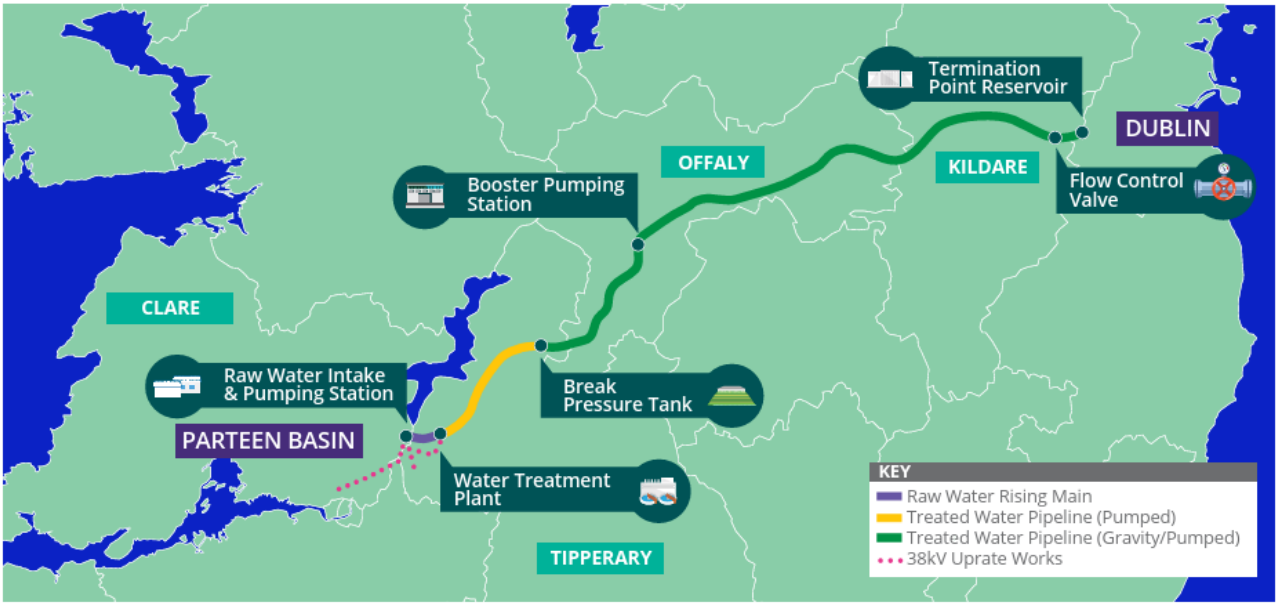

Image 3.1: Overview of the Proposed Project

17. To provide a new source of drinking water for the Eastern and Midlands Region and meet the deficit in supply, the Proposed Project involves the abstraction and pumping of raw water from the Lower River Shannon at Parteen Basin; treatment of the water nearby at Birdhill, County Tipperary; and pumping of the treated water to a high point near Cloughjordan, County Tipperary. From this high point near Cloughjordan, the treated water would flow generally by gravity through the Midlands, to a termination point at Peamount, in County Dublin (within the administrative area of South Dublin County Council), where it would connect into the existing GDA WRZ network.

18. The Proposed Project design includes the following principal elements:

- A Raw Water Intake and Pumping Station on the eastern shore of Parteen Basin would facilitate a maximum abstraction of up to 300Mld, during peak demand periods from the Lower River Shannon, downstream of Lough Derg
- Two steel pipelines, approximately 2km in length, and each 1,500mm in diameter, referred to as the Raw Water Rising Mains. These would transfer raw water from the Raw Water Intake and Pumping Station to a Water Treatment Plant near Birdhill, County Tipperary and each pipe would be capable of transferring raw water up to a maximum throughput of 300Mld
- The Water Treatment Plant would provide the infrastructure needed to clean the water to drinking standards and the capacity to pump the water through the Treated Water Pipeline
- A single steel pipeline of 170km in length and 1,600mm in diameter would transfer up to 300Mld of treated water from the Water Treatment Plant to the Termination Point Reservoir at Peamount, County Dublin. The Termination Point Reservoir would have a capacity to store up to 75 megalitres (Ml) and would provide the location for the Proposed Project to connect into the existing drinking water network

- Pipeline infrastructure including a Break Pressure Tank near Cloughjordan, County Tipperary; a Booster Pumping Station east of Birr, County Offaly; and a Flow Control Valve south of Newtown in County Kildare, approximately 5km west of the Termination Point Reservoir
- Operational ancillary infrastructure at frequent intervals along the length of the pipeline including Line Valves, Air Valves, water discharge points (referred to as Washouts), access points (referred to as Manways), parking Lay-Bys for maintenance access and power connections to the Line Valves
- Power connections to the Infrastructure Sites, including uprating of the existing Ardnacrusha – Birdhill 38 kilovolt (kV) overhead line to deliver adequate electrical power to the Raw Water Intake and Pumping Station and the Water Treatment Plant and providing a new connection from a substation at Birr to the Booster Pumping Station.

19. In addition to this infrastructure, provision has been made for take-off points at strategic locations between the Water Treatment Plant and Termination Point Reservoir. These would facilitate future potential connections to supply communities in the Midlands within the Water Supply Area (as set out in Section 2) without disruption to the operation of the pipeline. The connecting pipelines and associated infrastructure would be delivered by Uisce Éireann through separate projects, yet to be designed, and would be subject to their own separate consenting processes.

20. Image 3.2 provides a summary of the different elements of the Proposed Project.

21. The Proposed Project would be constructed and operated within predominantly open countryside, generally avoiding towns and villages. Farming is the primary land use within the Proposed Project Boundary, with the Proposed Project crossing over 400 agricultural landholdings.

22. The Proposed Project would traverse the administrative areas of six Local Authorities: Tipperary County Council, Clare County Council, Limerick City & County Council, Offaly County Council, Kildare County Council, and South Dublin County Council.

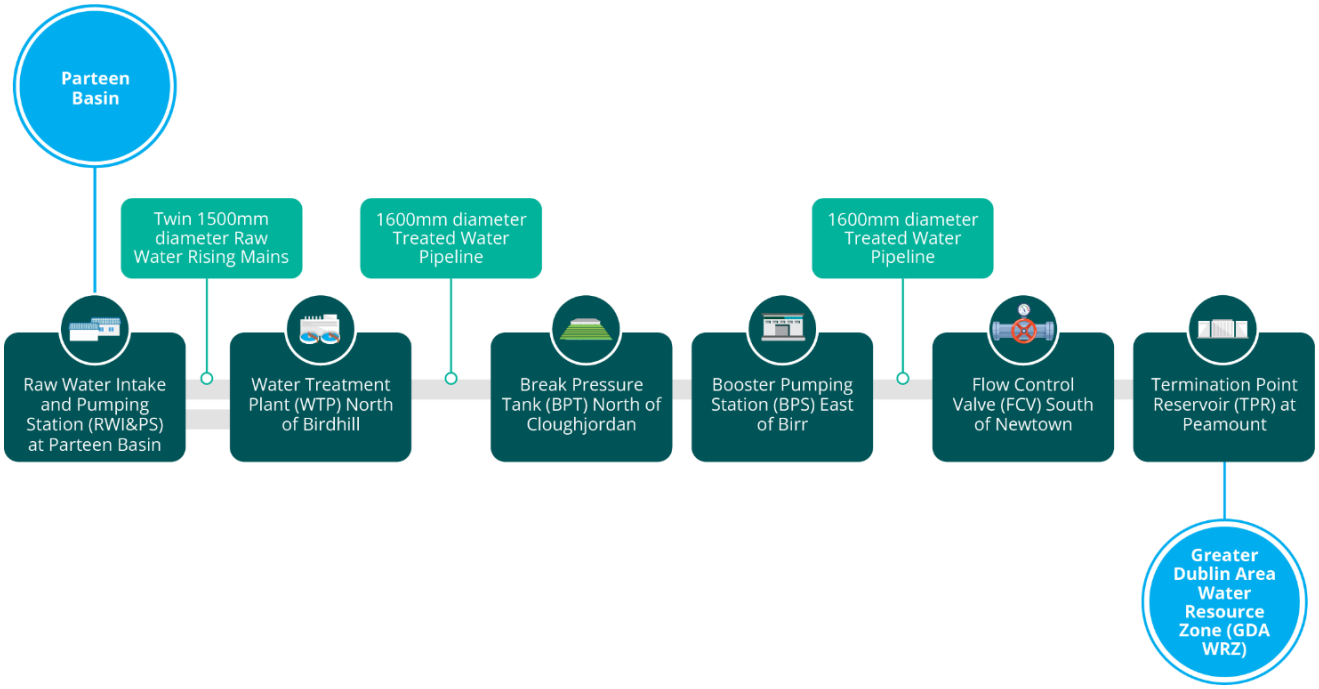

Image 3.2: Infographic Overview of the Principal Infrastructure and Pipeline Elements of the Proposed Project

3.2 Consideration of Alternatives and Environmental Design

23. The Proposed Project has been the subject of a comprehensive consideration of alternatives from the identified need, through assessment of options to meet that need, and selection of a preferred option. This has included strategic options and alternatives within the preferred water source option, including site selection, pipeline routing, and water treatment process options. The assessment took account of land use, planning and environmental effects at appropriate stages, as well as the views expressed in stakeholder and public consultations.

24. The reasonable alternatives considered alternative locations, layouts, design, power provisions, construction, and mitigation measures for the Proposed Project.

25. Route appraisal and environmental surveys together with consultation feedback resulted in a number of refinements to the optimal route, as it developed to become the Proposed Project. Upon identification of the preferred source option and abstraction location at Parteen Basin (in line with the National Water Resources Plan and Eastern and Midlands Plan, as set out in Section 2), alternatives were also considered in site selection for the different infrastructure elements of the Proposed Project.

26. Uisce Éireann chose a route for the pipeline that avoids environmentally sensitive areas and selected Infrastructure Site locations that, as far as reasonably practicable, minimise environmental impacts, whilst considering technical and cost factors.

27. The design has taken account of the Proposed Project's sustainability ambitions and incorporated design measures to reduce environmental effects (known as embedded mitigation) in response to the Environmental Impact Assessment process. For the design of the permanent infrastructure these included:

    - Selection of a solution which delivers a sustainable supply of water. The proposed drinking water abstraction is water that would otherwise be used in hydropower generation (from the Ardnacrusha Generating Station). A maximum of 2% of the long term annual average flow at Parteen Basin will be diverted for drinking water supply instead of being used for hydropower generation. This means that potential changes to the natural environment that could otherwise have occurred if overall abstraction rates were increased at Parteen Basin, or elsewhere, can be avoided by changing the use of the same volume of water which is already being abstracted from a lake. It also avoids the need to build a new impoundment and the environmental effects that would arise from doing so
    - Optimising gravity pressure for transporting treated water through the pipeline to reduce energy demand and related emissions from pumping
    - Choosing a route for the pipeline that avoids environmentally sensitive areas, as far as reasonably practicable given its length
    - Selecting Infrastructure Site locations that, as far as reasonably practicable, minimise environmental impacts, for example visual effects, whilst considering technical and cost factors
    - Optimising the operation of the pipeline taking into account the size of the steel pipe and the frequency with which pumping will be needed to supplement gravity fed supplies. This had to balance material use, embodied carbon and operational energy use
    - Designing the intake at Parteen Basin to protect biodiversity, such as preventing fish from being trapped
    - Designing the Water Treatment Plant to re-circulate waste washwater and avoid any discharge of wastewater
    - Using passive methods for lighting and ventilation of buildings
    - Incorporating solar panels at the Infrastructure Sites, including at the Water Treatment Plant, Break Pressure Tank, Booster Pumping Station, Flow Control Valve and Termination Point Reservoir, to provide renewable energy where practicable
    - Incorporating green roofs into the design of the Water Treatment Plant, Break Pressure Tank and Termination Point Reservoir and providing for rain water harvesting at the Raw Water Intake and Pumping Station and the Water Treatment Plant

- Including landscaping planting and habitat creation in the reinstatement proposals for the Infrastructure Sites.

3.3 Raw Water Intake and Pumping Station

28. The Raw Water Intake and Pumping Station is designed to abstract up to 300Mld of raw water from Parteen Basin and pump it to the Water Treatment Plant.

29. The abstraction would take place from the eastern shore of Parteen Basin, downstream of Lough Derg on the Lower Shannon, in the townland of Garrynatineel. This is approximately 3.3km north-east of the Parteen Weir and approximately 14.3km upstream of the Electricity Supply Board (ESB) Ardnacrusha Generating Station. Its location is shown in Image 3.1. The main components of the Raw Water Intake and Pumping Station are shown in Image 3.3, and a visualisation is shown in Image 3.4.

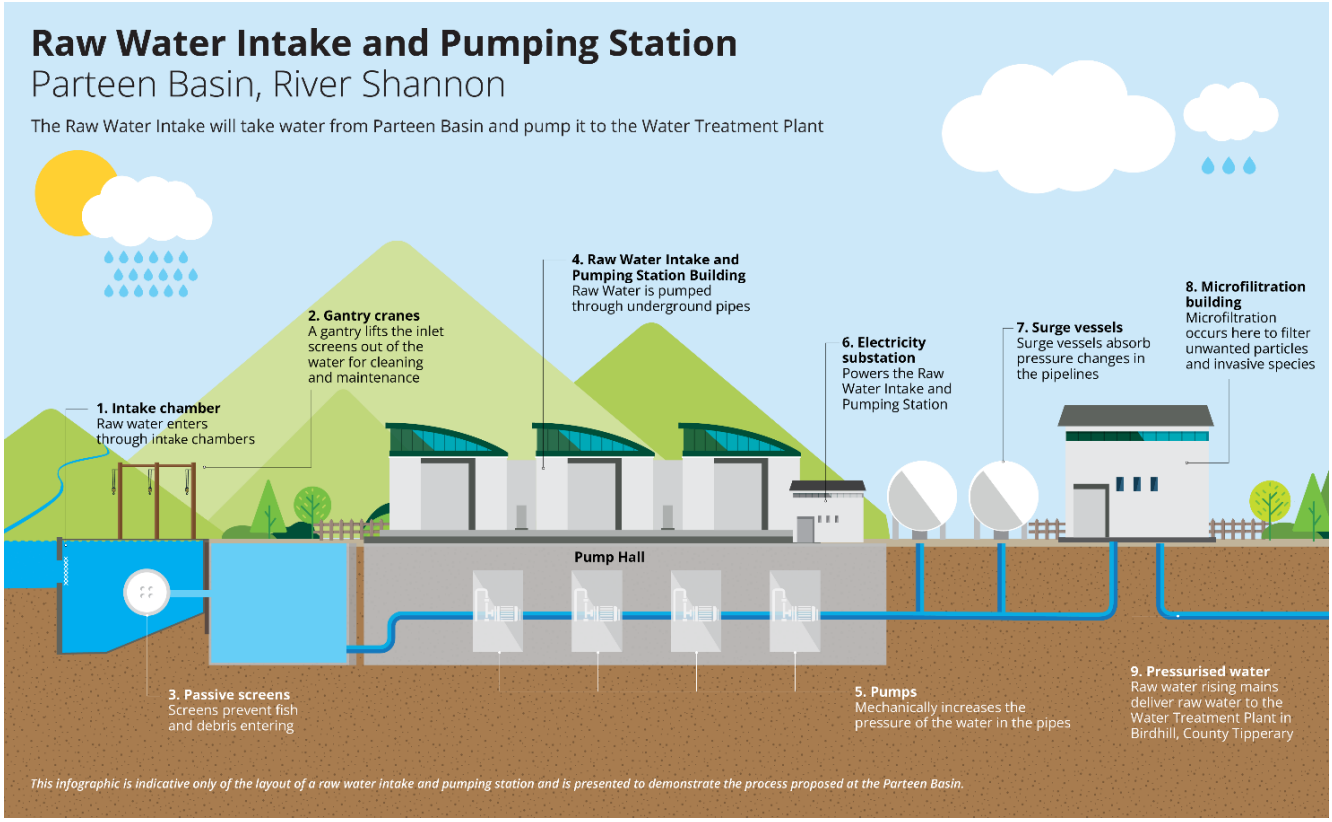

Image 3.3: Overview of the Raw Water Intake and Pumping Station

30. The permanent site for the Raw Water Intake and Pumping Station would occupy an area of 4ha (including a permanent new access road) and is currently used mainly as non-commercial forestry. An additional area of 1ha of land would be required on a temporary basis during construction and so the total area of land needed for construction is 5ha.

31. The site is within the Lower River Shannon Special Area of Conservation – a protected area designated to protect important species and conserve natural habitats. The proposals for the design, construction, operation and maintenance of the proposed Raw Water Intake and Pumping Station have taken into account the habitats and species which the Special Area of Conservation is designated to protect.

32. During operation, water would be abstracted from Parteen Basin at the Intake Chamber. The volume of water to be abstracted would be determined using a three-day predictive modelling process that calculates how much water would be needed. The raw water would enter the Intake Chamber and then pass through Passive Wedge-Wire Cylinder Intake Screens into the Inlet Chambers. The Passive Wedge-Wire Cylinder Intake Screens are used to separate the raw water from any debris or aquatic life such as fish. Water pumped from here can be passed through the microfiltration process as required before being delivered to the Water Treatment Plant via the Raw Water Rising Mains.

33. A new permanent access road would be constructed from the R494 to the Raw Water Intake and Pumping Station site. The road would be 5m wide and 670m in length. This access would also be used during construction to build the Raw Water Intake and Pumping Station.

34. Landscape planting at the Raw Water Intake and Pumping Station will include mosaic planting (a mixture of trees and scrubs), woodland planting, and species rich semi-natural grassland along the verges of the access road. This planting will provide a visual barrier for the permanent infrastructure.

Image 3.4: Raw Water Intake and Pumping Station Architectural Visualisation

3.4 Raw Water Rising Mains

35. The purpose of the Raw Water Rising Mains is to transfer up to 300Mld of raw water from the Raw Water Intake and Pumping Station to the Water Treatment Plant. The Raw Water Rising Mains would consist of two steel pipelines, approximately 2km long, each with a diameter of 1,500mm. They would extend in a generally east-south-easterly direction from the Raw Water Intake and Pumping Station for approximately 850m towards the R494. From the R494, the Raw Water Rising Mains would continue in an east-north-easterly direction to the Water Treatment Plant at Incha Beg.

36. Access to the Raw Water Rising Mains during construction would be along the route of the Pipeline Corridor. Once built and the land reinstated, access to the pipeline for inspection and maintenance would generally be via a Permanent Wayleave – a 20m area of land centred on the pipeline which gives Uisce Éireann the right to construct, inspect, operate and maintain the pipeline.

3.5 Water Treatment Plant

37. The Water Treatment Plant is needed in order to treat the raw water to a sufficiently high standard to be fit for drinking. The proposed Water Treatment Plant would be located in the townland of Incha Beg in County Tipperary, approximately 2.6km north-east of the village of Birdhill. The site is located within a sparsely populated rural area which is broadly bounded within a triangle formed by the R496, R445 and R494 regional roads. Its location is shown in Image 3.1. The main components of the Water Treatment Plant are shown in Image 3.5, and a visualisation is shown in Image 3.6.

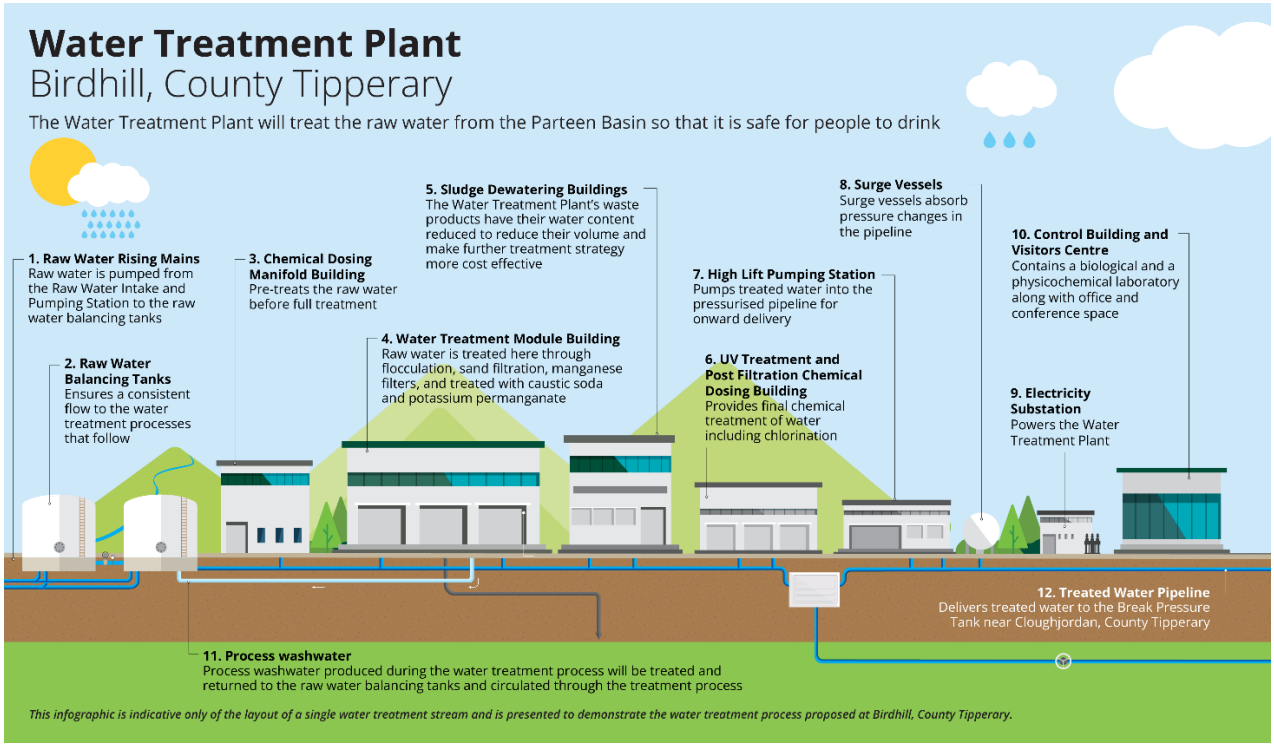

Image 3.5: Overview of the Water Treatment Plant

38. The permanent infrastructure would be located immediately north of dense woodland on open fields, covering an area of 31ha (including a new permanent access road). An additional area of 2.5ha would be required on a temporary basis during construction and so the total area of land needed for construction is 33.5ha.

39. Raw water would enter the Water Treatment Plant at the Raw Water Balancing Tanks. The water would then pass through the water treatment process. The process wastewater from the treatment process would not be discharged, rather it would be pre-treated on site before it is re-circulated through the Water Treatment Plant. The Clear Water Storage Tanks and High Lift Pumping Station are at the end of the treatment process. The tanks store clean water temporarily so that the onward flow of water through the pipeline can be controlled. The pumping station would pump the water through the pipeline from the Water Treatment Plant to the Break Pressure Tank.

40. Access to the Water Treatment Plant would be via a new permanent access road from the R445, which is 6m wide and 640m in length. This access would also be used during construction to build the Water Treatment Plant.

41. The Water Treatment Plant will be landscaped to reduce the visual effect of the permanent infrastructure. This includes planting species rich semi-natural grassland and trees within the site boundary, as well as wet grassland in an area to the north of the site, and woodland in a north-eastern corner. A bat house will be provided to mitigate the impact on bats. Specific planting will be installed to support the bat house.

Image 3.6: Water Treatment Plant Architectural Visualisation of the Control Building and Visitor Centre

3.6 Treated Water Pipeline – Water Treatment Plant to Break Pressure Tank

42. The Treated Water Pipeline would transfer clean, treated drinking water from the Water Treatment Plant to the Termination Point Reservoir.

43. The first section of the Treated Water Pipeline is located within County Tipperary. It is an underground pipeline approximately 37km in length connecting the Water Treatment Plant at Incha Beg, to the Break Pressure Tank, located at Knockanacree Hill, near Cloughjordan, County Tipperary.

44. The water in this section of the pipeline would always be pumped through the pipe by the pumping equipment at the Water Treatment Plant. The pipeline would consist of a single, 1,600mm nominal diameter steel pipeline that would be generally laid at a minimum depth of 1.2m and at a maximum depth of 4.4m (above the top of the pipe), although the pipe may be deeper where it crosses certain watercourses.

45. Access to the pipeline during construction would be along the route of the Pipeline Corridor. Once built and the land reinstated, access to the pipeline for inspection and maintenance would generally be via the Permanent Wayleave.

3.7 Break Pressure Tank

46. The Break Pressure Tank provides a point where the pressure in the pipeline can be managed and would be used to transition to the use of gravity to maintain a flow of water in the pipeline under normal conditions. The water would be pumped from the Water Treatment Plant to the Break Pressure Tank but from the Break Pressure Tank the water would usually be moved through the pipe by gravity pressure. This avoids the need for the water to be pumped through the length of the pipeline all the time and consequently, would reduce the amount of energy needed during operation. In order to do this, the Break Pressure Tank is intentionally located at the highest point on the route of the Proposed Project. Its location is shown in Image 3.1. The main components of the Break Pressure Tank are shown in Image 3.7, and a visualisation is shown in Image 3.8.

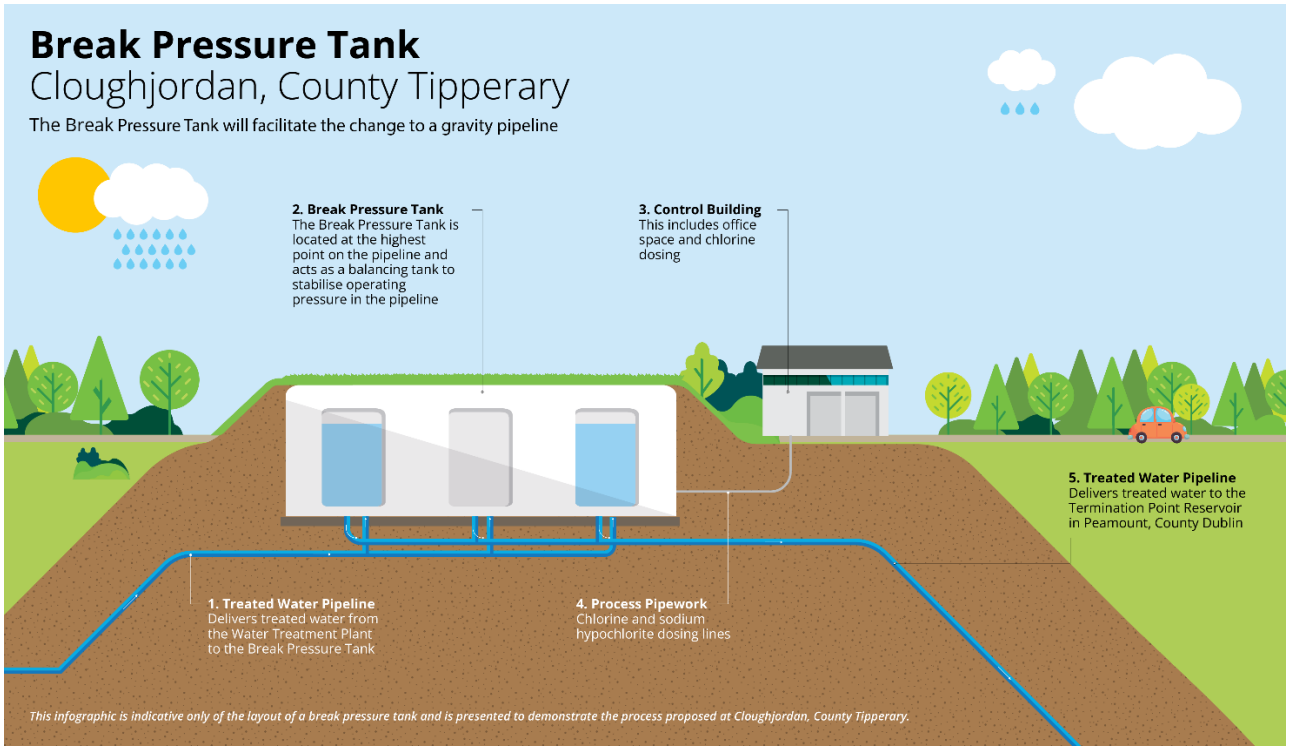

Image 3.7: Overview of the Break Pressure Tank

47. The proposed Break Pressure Tank is located in the townland of Knockanacree in County Tipperary, 1.8km north of Cloughjordan.

48. The permanent extent of the site is 7ha (including the access road) and the land is mainly in agricultural use as pastureland. An additional 0.8ha of land would be required on a temporary basis during construction, bringing the total area of land needed for construction to 7.8ha.

49. The Break Pressure Tank site includes the Break Pressure Tank and a Control Building. The Break Pressure Tank would be partially buried within an earthwork bank.

50. A new access road would be constructed from the L1064, which would be 5m in width and 794m in length. This access would also be used during construction to build the Break Pressure Tank.

51. Land to the east of the Break Pressure Tank has been incorporated into the Proposed Project to allow for woodland habitat creation. Additional woodland is proposed along the western boundary and to the north of the site. There is existing woodland to the south of the site and so the planting proposals would connect the Break Pressure Tank site into this woodland. Mosaic habitat is proposed in the north-eastern and north-western parts of the site, and species rich semi-natural grassland planting around the tank itself and along the access road. A circular walk will be provided within the woodland planting on site at the Break Pressure Tank and this walk will connect into Knockanacree Wood.

Image 3.8: Architectural Visualisation of the Break Pressure Tank Control Building

3.8 Treated Water Pipeline – Break Pressure Tank to the Termination Point Reservoir

52. The second section of the Treated Water Pipeline would transfer clean, treated drinking water from the Break Pressure Tank approximately 133km to the Termination Point Reservoir, which would be located adjacent to, and immediately west of, Peamount Hospital in County Dublin. From the Break Pressure Tank, the proposed pipeline would extend in an east to north-east direction through northern County Tipperary and Counties Offaly and Kildare before terminating in County Dublin. Through this section the pipeline would primarily be routed through agricultural land, but there are extensive areas of peatland in County Offaly and eastern County Kildare through which the pipeline would be constructed.

53. The pipeline would run full at all times and be kept pressurised by a combination of the water level in the Break Pressure Tank and the back pressure governed by the Flow Control Valve located at the low point prior to the Termination Point Reservoir.

3.9 Booster Pumping Station

54. The purpose of the Booster Pumping Station is to facilitate the movement of the water from the Break Pressure Tank to the Termination Point Reservoir through the Treated Water Pipeline when higher flow rates are required. Flows up to 165Mld can move from the Break Pressure Tank to the Termination Point Reservoir under gravity pressure without further intervention. However, when the demand for water increases above approximately 165Mld, additional pumping would be needed to provide the additional pressure required to deliver flows up to the peak demand of 300Mld. The Booster Pumping Station would contain the pumps needed to do this. Its location is shown in Image 3.1. The main components of the Booster Pumping Station are shown in Image 3.9, and a visualisation is shown in Image 3.10.

55. The proposed Booster Pumping Station site is located to the east of Birr, in the townland of Coagh Upper, County Offaly, approximately 66km east of the proposed Water Treatment Plant. The Booster Pumping Station site is located within a rural area of agricultural land adjacent to the L3003. The permanent extent of the site is 2.6ha including the access road. An additional 3ha land would be required on a temporary basis during construction, bringing the total area of land needed for construction to 5.6ha.

56. Permanent access to the site would be directly off the L3003 and this would also be used during the construction of the Booster Pumping Station.

57. The Booster Pumping Station will be landscaped to reduce the visual effect of the permanent infrastructure. The proposals include for species rich semi-natural grassland planting within the site and tree planting around the perimeter of the site.

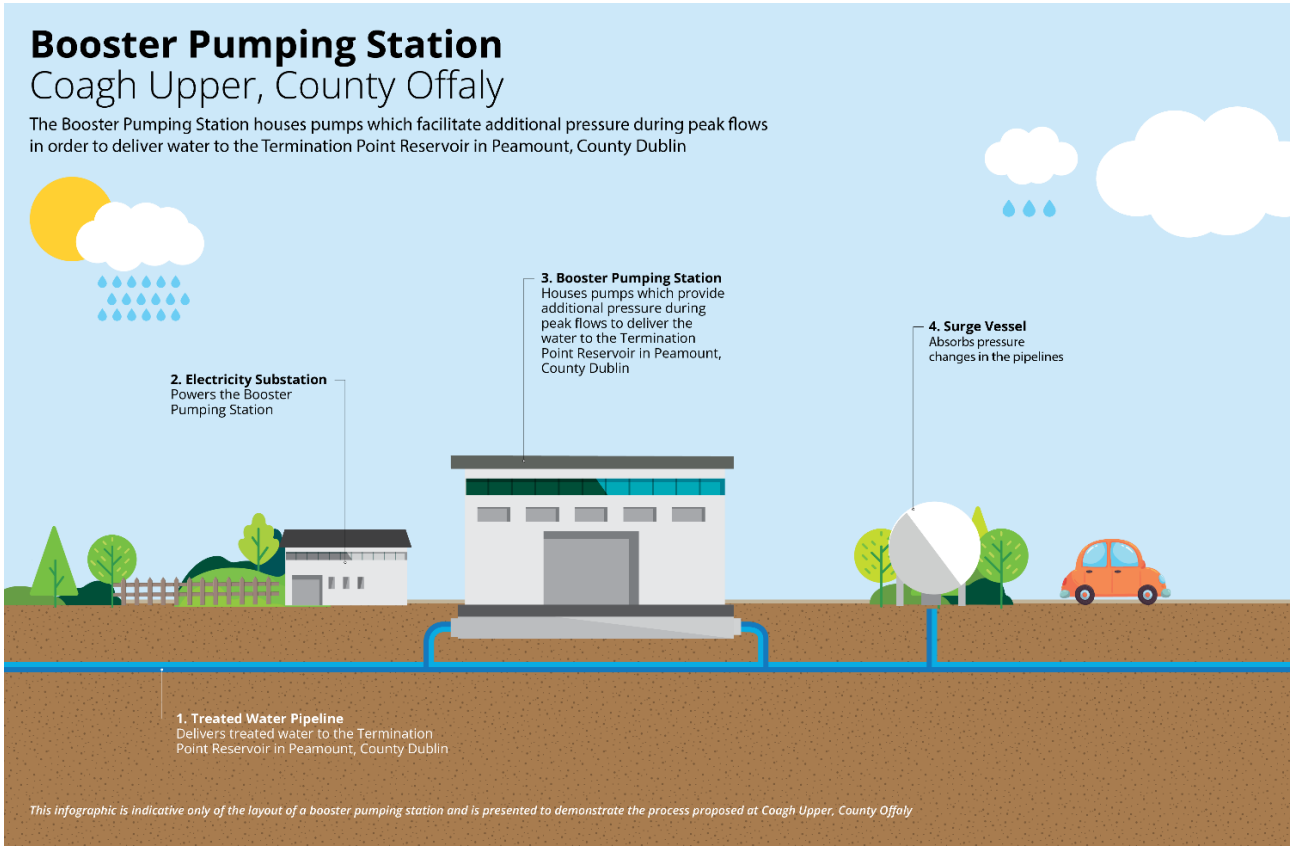

Image 3.9: Overview of the Booster Pumping Station

Image 3.10: Booster Pumping Station Architectural Visualisation

3.10 Flow Control Valve

58. Approximately 5km west of the Termination Point Reservoir would be the Flow Control Valve. This is a specific valve that provides fine control of the flows in the pipeline and would be used to manage the volume of water arriving at the Termination Point Reservoir.

59. The Flow Control Valve would consist of three below ground valves (used to start, stop or regulate the flow of water through the pipeline) and a small above ground facility and compound including parking.

60. The extent of the permanent Flow Control Valve site would be 0.5ha. An additional area of 0.6ha of land would be required on a temporary basis during construction and so the total area of land needed for construction is 1.1ha.

61. Permanent access to the site would be directly from the L1016 and this would also be used during the construction of the Flow Control Valve.

62. The Flow Control Valve will be landscaped to reduce the visual effect of the permanent infrastructure. The proposals include for species rich semi-natural grassland and mosaic planting within the site and a thick hedgerow around the perimeter of the site.

3.11 Termination Point Reservoir

63. The purpose of the Termination Point Reservoir is to store water supplied through the Treated Water Pipeline to manage the distribution of water to consumers in the GDA WRZ. It would act as a balancing tank between the steady output of the Water Treatment Plant and the normal variation in demand of the local distribution network. It would have a capacity of 75Ml. Its location is shown in Image 3.1. The key components of the Termination Point Reservoir are shown in Image 3.11, and a visualisation is shown in Image 3.12.

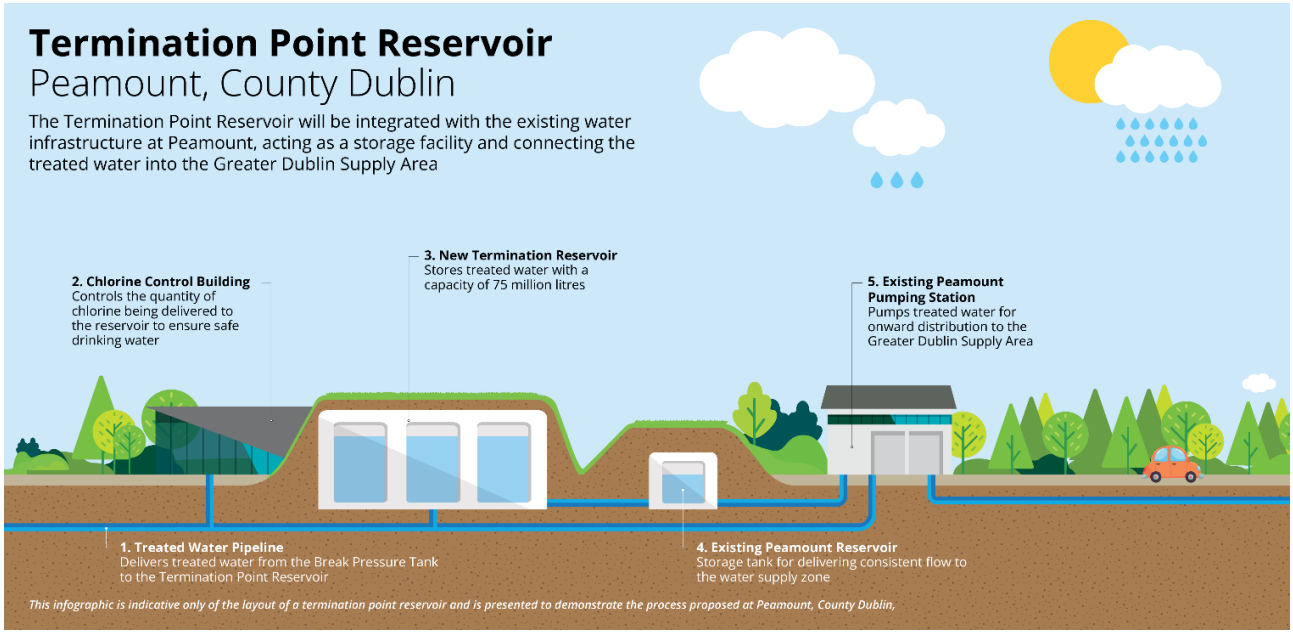

Image 3.11: Overview of the Termination Point Reservoir

64. The proposed Termination Point Reservoir is located adjacent to the existing Uisce Éireann service reservoir site at Peamount in County Dublin.

65. The proposed site for the permanent Termination Point Reservoir has an area of 8.3ha (including the access road). An additional area of 1.1ha of land would be required on a temporary basis during construction and so the total area of land needed for construction is 9.4ha.

66. The proposed Termination Point Reservoir would be a rectangular, reinforced concrete tank, similar to the existing reservoir structure on the adjacent site. This would be permanently covered over and surrounded by an earth embankment. The top of the Termination Point Reservoir would be 11.2m above finished ground level.

67. The Termination Point Reservoir would be integrated with the existing reservoir site layout so that it becomes one larger water storage facility, incorporating common means of access, site road layout and power supply. It would also utilise the common office and welfare facilities on the existing site.

68. The current access to the existing service reservoir is off the R120 via a cul-de-sac on the north-eastern perimeter of Peamount Hospital. A new access road, 5m in width and 342m in length, would be constructed off the R120 regional road, and adjacent to the western and northern perimeter of Peamount Hospital.

69. The Termination Point Reservoir will be landscaped to reduce the visual effect of the permanent infrastructure. The area around and to the south of the new reservoir will be planted to create species rich semi-natural grassland. Woodland planting is proposed within the site of the existing reservoir and a mixed mosaic habitat is proposed where below ground infrastructure places restrictions on what can be planted at the surface.

Image 3.12: Architectural Visualisation of the Chlorine Dosing Control Building

3.12 Pipeline Features

70. The Raw Water Rising Mains and Treated Water Pipelines would incorporate several key pipeline features (as shown in Image 3.13).

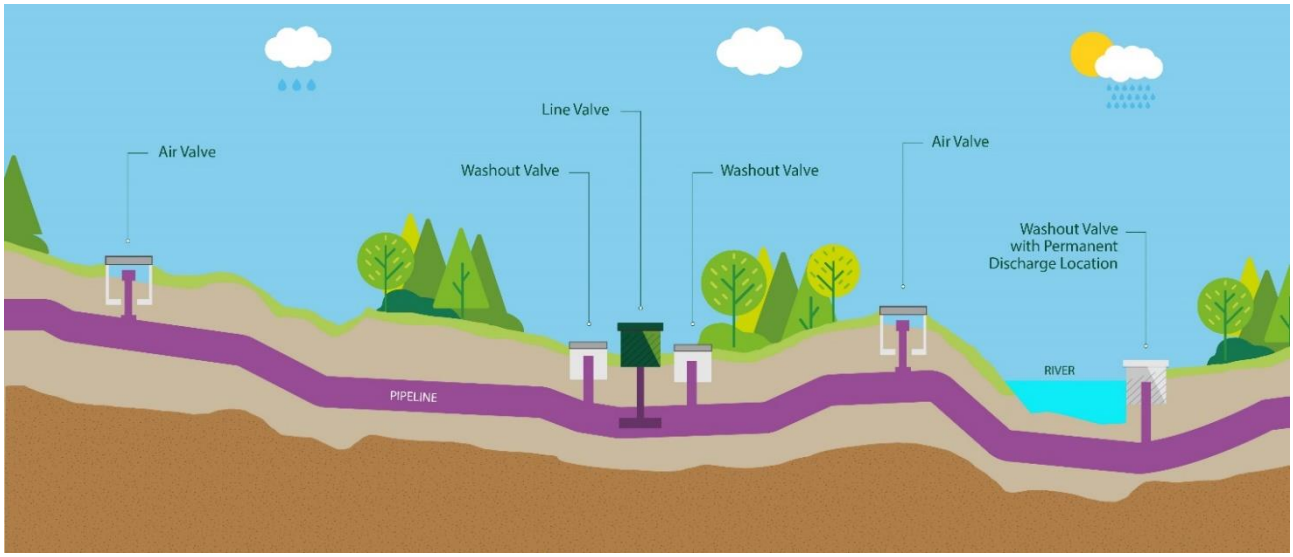

Image 3.13: Overview of a Pipeline Section Showing Pipeline Features

3.12.1 Line Valves

71. Line Valves would be installed along the length of the pipeline to enable sections of the pipe to be isolated, drained and recharged during testing and commissioning and for maintenance purposes once the Proposed Project is operational.

3.12.2 Chambers and Kiosks

72. Each of the Line Valves would be housed in a below ground concrete chamber. The chamber would contain the principal valve and associated powered actuator along with pressure instruments, flood detection and control equipment. The chamber would allow this equipment to be protected and to be more easily accessed during the operation of the pipeline. In addition to the chamber, a pair of kiosks would be installed close by each Line Valve.

3.12.3 Lay-Bys

73. At Line Valve locations adjacent to roads, Lay-Bys would be constructed to facilitate safe parking during planned periodic inspection and maintenance of the Line Valves and associated electricity supply kiosks.

3.12.4 Washout Valves

74. Washout Valves would be located at every low point along the pipeline. These valves would be used to empty sections of the pipeline of test water which cannot be pumped to adjoining test sections. During pipeline operation, it would be very rare that these valves are used as they would generally only be required for emptying sections of the pipeline where necessary for emergency repairs or possibly for cleaning programmes every 20 to 30 years. Washout Valves would be buried below the surface, accessed via surface boxes at ground level.

75. Washouts would discharge to either nearby watercourses (some of which would have a permanent outfall; the others being a temporary solution such as from a flexible hose) or to land, where water would be allowed to soakaway responsibly taking into account local conditions at that time. Discharges from washouts would be dechlorinated prior to discharge to the environment.

3.12.5 Air Valves

76. The control of air in the pipeline is critical for initial filling and priming, for efficient operation and for draindown and recharge of the pipeline. Air Valves would be used to manage air within the pipeline and would be located at high points along the pipeline to allow air to be released. Air Valve chambers would protrude approximately 1m above the existing ground level.

3.12.6 Manways

77. Manways are predominantly provided for the disinfection prior to the final filling of the pipeline prior to going into service. After this they are anticipated to be used extremely rarely. Manways are buried with the pipeline, so there would be nothing visible on the ground surface.

3.12.7 Cathodic Protection

78. As well as internal and external protective coatings, the steel pipeline would be protected against corrosion by placing a very low continuous voltage (one or two volts) on to the pipeline which can be continuously monitored. This alerts the operators should changes in system current occur, which may indicate possible damage to the pipe coatings and that may, in the long run, cause localised corrosion. The system would work silently and continuously.

3.13 38 kV Uprate Works and Power Connections

79. Each Infrastructure Site would require a power connection. These would be provided by ESB Networks from their existing network via a combination of overhead lines and buried cables. A power supply would also be required for each of the Line Valves.

80. Part of the Proposed Project would involve the uprate of existing overhead lines – increasing the power-handling capacity of existing transmission lines without requiring new construction. The purpose of this is to provide the power supply needed for the Raw Water Intake and Pumping Station and Water Treatment Plant.

81. The works would entail uprating the existing Ardnacrusha – Birdhill (38 kV overhead) Line running from the Ardnacrusha Substation in County Clare to the Birdhill 38 kV Substation in County Tipperary.

82. Fifteen polesets/structures would be replaced and uprated, 110 fittings and conductors would be replaced and 11 structures would be removed and replaced with an underground cable.

83. There would be no permanent access routes constructed for the 38 kV Uprate Works. Future access would be under ESB Networks' existing wayleaves.

3.14 Permanent Land Use

84. Acquisition of land on a permanent basis would be required for the Raw Water Intake and Pumping Station, Water Treatment Plant, Break Pressure Tank, Booster Pumping Station, Flow Control Valve and Termination Point Reservoir, and where permanent access roads to these locations are required. In addition, the acquisition of land would also be required for Lay-Bys adjacent to Line Valve locations and for valves where there are above ground features.

85. Along the pipeline the Proposed Project would have a Permanent Wayleave, which gives Uisce Éireann the right to construct, inspect, operate and maintain the Raw Water Rising Mains, Treated Water Pipeline and associated infrastructure. In addition, certain restrictions would apply within this wayleave in order to protect the pipeline including limiting future development and restricting planting of certain species of tree. Line Valves, Washout Valves and Air Valve locations would be situated within the Permanent Wayleave. The Permanent Wayleave associated with the Raw Water Rising Mains and Treated Water Pipeline would be approximately 20m in width, normally centred on the pipeline. However, at Line Valves the Permanent Wayleave would be slightly widened to take account of additional permanent features including the kiosks and to provide operational access.

86. There would also be Permanent Wayleaves associated with connections from the Washout Valves to permanent outfall locations. These would be approximately 10m in width, normally centred above the connection pipe. In addition, the permanent power connections to the Line Valves would have a separate wayleave for ESB Networks.

3.15 Decommissioning

87. The Proposed Project would deliver nationally important strategic infrastructure with individual elements designed with a lifespan of 80 to 100 years. The strategic importance of the Proposed Project for water supply in the Eastern and Midlands Region is such that there is no plan to decommission these structures and Uisce Éireann is committed to maintaining and repairing them into the future. On this basis it is not likely that the structures will be decommissioned, and therefore decommissioning of the Proposed Project has not been considered in the environmental assessment.

4. Construction and Commissioning

4.1 Construction Working Area

88. Section 3 provides temporary working areas for the Infrastructure Sites. For the pipeline, a Construction Working Width would be temporarily required for the period of construction of the pipeline. It would typically be 50m in width but would be locally wider near features such as crossings, access points from the public road network and in certain ground conditions, such as when working in peat. An indicative Construction Working Width is shown in Image 4.1, and Image 4.2 shows a typical pipeline installation within the Construction Working Width.

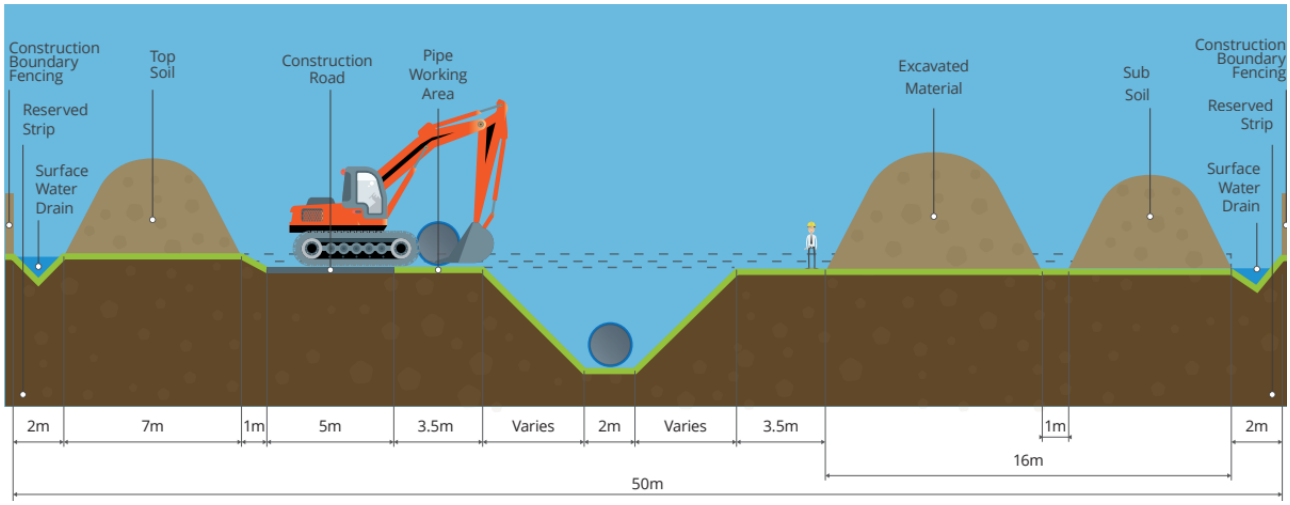

Image 4.1: Indicative Construction Working Width Cross Section

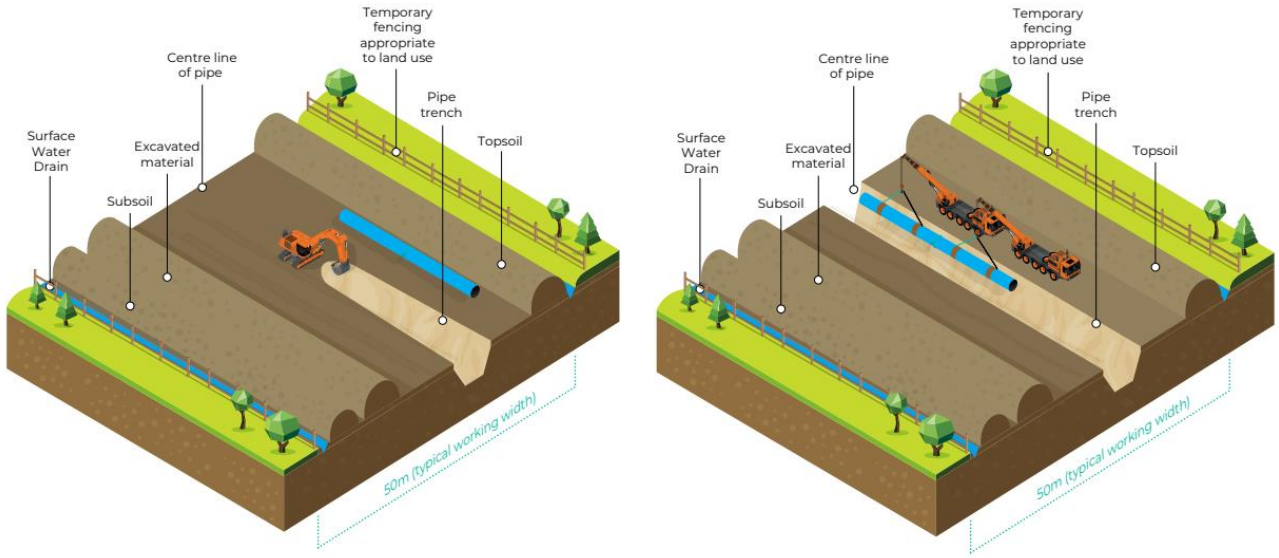

Image 4.2: Trench Excavation and Pipe Installation

4.2 Crossings

89. At certain locations along the Construction Working Width, the pipeline would be required to cross existing infrastructure or environmental features, such as roads, railway tracks, power lines, and rivers.

90. Trenchless construction techniques would be used underneath major crossings, for example major roads, railways, canals and major watercourses. This involves tunnelling beneath a feature rather than using a conventional open-cut method which causes a greater environmental impact or disruption. Trenchless crossings take longer to construct (typically six to eight weeks to construct) than open-cut methods and also require a wider Construction Working Width to facilitate the temporary works. Trenchless crossings can also have additional environmental effects, such as noise associated with the drilling. Therefore, careful consideration is required when determining whether to use an open-cut or trenchless crossing, taking into account the sensitivity of the surrounding environment and the disruption that may result. Image 4.3 shows typical equipment and activities from trenchless crossing.

Image 4.3: Typical Tunnelling Boring Head Equipment (Left) and Pipe being Pulled into Tunnel (Right)

91. Traditional open-cut methods would be used to cross less sensitive features, such as minor roads and small watercourses and ditches. Where roads are crossed with this method, there would be temporary disruption (typically no more than 48 hours) as the road would need to be closed and a temporary diversion put in place. Where watercourses are crossed by this method, techniques would be used such as damning and pumping to create dry working conditions, while maintaining the flow of water and protecting aquatic ecology.

4.3 Construction Programme

92. Construction works for the Proposed Project are anticipated to commence in 2028, subject to planning approval from An Coimisiún Pleanála. An abstraction licence will be sought from the Environmental Protection Agency prior to construction. The construction works are expected to be substantially complete in 2032. The construction activities for the principal elements of the Proposed Project would encompass the following broad areas of work:

- Pre-construction surveys including, for example, biodiversity surveys for species and ground investigation
- Site clearance, including removal of topsoil, trees and hedgerows as required
- Erection of temporary fencing
- Establishment of Construction Compounds including parking areas, storage areas, power supply and welfare facilities
- Establishment of Pipe Storage Depots
- Construction of site roads and temporary access roads
- Construction of Infrastructure Sites
- Construction of pipelines – Raw Water Rising Mains and the Treated Water Pipeline
- Construction of pipeline features including Line Valves, Washout Valves, Air Valves, Lay-Bys, and potential future connection points

- Additional works including system control infrastructure, lighting, fencing, kiosks, power supplies and Cathodic Protection
- Site landscaping and planting
- Testing and commissioning
- Site demobilisation
- Handover to the appointed Operator.

93. Over the estimated five-year Construction Phase of the Proposed Project, the construction activities would be sequentially scheduled by the appointed Contractor to optimise resources and programme.

94. Based on this sequential approach, although the overall Construction Phase is five years, the timescales in the majority of locations would be shorter, with approximately 24 months between the initial occupation of the land and subsequent 'hand back' subject to any seasonal constraints for reinstatement. The appointed Contractor would require access to the 20m wide Permanent Wayleave during the final year of the programme and the commissioning phase.

4.4 Reinstatement

95. Following completion of the construction works the general principle is that the land would be reinstated on a 'like for like' basis, based on the habitat and features that were on site before the works commenced (see an example in Image 4.4). This would include the reinstatement of the soils, drainage, fencing and vegetation on a 'like for like' basis. However, this would be subject to:

- Variations agreed with the relevant landowner regarding matters such as the location or type of gates, fencing or drainage
- Restrictions on structures that can be placed above the pipeline
- Restrictions on the type of planting that can be put over the top of the pipeline, including not planting trees that would grow to more than 4m in height. A mosaic habitat of trees and scrubs would be reinstated in place of, for example, woodland and forestry plantations that would include such tree species.

Image 4.4: Example of Land Reinstatement (Left: Pipeline Installation, Right: Following Reinstatement)

4.5 Environmental Management

96. A Construction Environmental Management Plan has been produced which sets out the mitigation measures that will be used to manage the potential environmental impacts of constructing the Proposed Project.

97. The appointed Contractor(s) will be required to apply the measures in the Construction Environmental Management Plan. This will include any requirements from any relevant planning conditions attached to the planning permission.

98. The Construction Environmental Management Plan includes, but is not limited to:

- Measures to manage surface water and water quality, within a Surface Water Management Plan
- Measures to manage and reduce noise levels, within a Noise and Vibration Management Plan
- Measures to handle, store and manage soils, within a Soil Management Plan
- Measures to manage traffic on public roads, within a Traffic Management Plan
- Measures to control dust from construction sites, within a Dust Management Plan
- Measures to reduce and manage waste, within a Construction Waste and By-Product Management Plan
- Measures to prevent the spread of invasive species, within an Invasive Species Management Plan
- A register of environmental commitments, to document all specific mitigation measures for the Proposed Project.

4.6 Construction Compounds and Pipe Storage Depots

99. Construction Compounds and Pipe Storage Depots are temporary areas required to facilitate construction of the Proposed Project.

100. There would be four principal Construction Compounds that would act as the appointed Contractor's central operational hub for plant/material/worker movement, general storage, administration, logistical support, and technical staff. The principal Construction Compounds would vary in size between 12ha and 16ha, with one larger 30ha compound at the Water Treatment Plant site, allowing adequate space for management and welfare facilities, plant storage, vehicle parking and traffic circulation. The four principal Construction Compounds are proposed at the following locations:

- In the townland of Incha Beg, County Tipperary, within the Water Treatment Plant site. This is the proposed Construction Compound for the Raw Water Intake and Pumping Station, Raw Water Rising Mains and Water Treatment Plant
- In the townland of Lisgarriff, County Tipperary. This is the proposed Construction Compound for the Treated Water Pipeline from the Water Treatment Plant to the Break Pressure Tank and the Break Pressure Tank itself (including a crossing just to the east of the Break Pressure Tank)
- In the townland of Killananny, County Offaly. This is the proposed Construction Compound for the section of Treated Water Pipeline from the Break Pressure Tank to the Booster Pumping Station, and the Booster Pumping Station itself
- In the townland of Drummond, County Kildare. This is the proposed Construction Compound for the Treated Water Pipeline from the Booster Pumping Station to the Termination Point Reservoir, and the Termination Point Reservoir itself.

101. In addition to these four principal Construction Compounds, there would be four secondary satellite Construction Compounds located at the Raw Water Intake and Pumping Station, Break Pressure Tank, Booster Pumping Station and Termination Point Reservoir. These would vary in size between 3ha and 12ha. These satellite Construction Compounds would provide materials storage and support plant and workers along the route for an efficient construction programme. This would, for example, help to reduce traffic to and from principal Construction Compounds.

102. In addition to the Construction Compounds, nine Pipe Storage Depots would be used to take direct delivery of the pipe for storage before onward journey to the required location along the pipeline. Given the volume of pipe material to be delivered, it is not considered feasible to deliver pipe material directly to the point of installation. The pipe would be transported from the Pipe Storage Depot to its point of installation via either the Haul Road network (public roads) or directly along the Construction Working Width. Approximately 2ha to 11ha of land-take would be needed for each Pipe Storage Depot.

103. The Construction Compounds and Pipe Storage Depots would be bounded by a 2.4m high hoarding fence on all sides, which would provide noise and visual screening.

4.7 Construction Working Hours

104. The typical working hours during the Construction Phase are:

- Monday to Friday – 7am to 7pm
- Saturday – 8am to 4.30pm.

105. However, certain construction activities would need to be undertaken outside typical working hours. This includes works associated with trenchless crossings of roads, railways, major rivers and power lines, which would take place 24 hours a day; and works to complete open-cut crossings of roads to minimise the length of time for road closures.

106. Occasionally, certain construction traffic would need to be moved outside typical working hours or at night. Such loads may include prefabricated tanks, large, non-standard equipment, or precast concrete units. This will be done in conjunction with Gardaí, Transport Infrastructure Ireland and Local Authorities. In addition, it has been requested by Kildare County Council that construction traffic movement through Celbridge be undertaken at night to avoid impacting traffic levels during the day.

107. Working outside of typical working hours may also be required to carry out, or attend to, an emergency on the works.

4.8 Construction Workers

108. Throughout the Construction Phase, different skillsets would be required at different stages for each of the Infrastructure Sites, pipeline, and the 38 kV Uprate Works. It is anticipated that there would be in the region of 1,065 of workers deployed across the works at the peak of the Construction Phase. Workers would include general operatives; plant operators; concrete and steel workers; pipe technicians and welders; mechanical and electrical engineers and technicians; project management staff; and supporting staff.

4.9 Construction Traffic

109. Construction traffic would make use of Haul Roads. Haul Roads are part of the public road network which have been designated for the movement of construction materials, plant and workers to, from and between the Infrastructure Sites, the pipeline and temporary works areas such as the Construction Compounds and Pipe Storage Depots. They include national, regional and local roads.

110. The Haul Roads have been determined based on the location of road crossings and access points, their capacity to accept a large number of vehicle movements, and in consultation with the Local Authorities most directly impacted by the Proposed Project and Transport Infrastructure Ireland.

111. The use of the Haul Roads will be managed through traffic management measures set out in the Traffic Management Plan. This includes, for example, traffic calming measures, temporary diversions where road closures are required, and measures for maintaining the condition of the roads.

4.10 Access

112. During construction, access to the Infrastructure Sites would be via the proposed permanent access road of each site. Where each Haul Road intersects with the Construction Working Width for the pipeline, an access point to and from the Construction Working Width would be provided. The access points facilitate the movement of construction traffic (plant, labour and materials) to and from the Haul Roads to the works areas and allow for adequate visibility of the adjoining road based on sight lines appropriate to the speed limit of the road. The access points would be secured at all times and manned during working hours.

4.11 Fencing

113. The type of fencing provided along the Construction Working Width would be site specific and dependent on the particular land use employed at a given location and would be agreed with landowners in advance of the works commencing. Where access across the Construction Working Width is required by landowners to facilitate activities on the lands, access gates would be provided.

4.12 Working in Peat

114. There is approximately 53km of the pipeline construction which would be within areas identified as peat soils. Different construction methods would be used in peat, depending on the depth of the peat and the conditions on site at the time of construction (for example, in areas of deeper peat, stone pillars would be required to support the pipeline).

115. Following completion of the construction works the general principle is that the areas of peat would be reinstated in a manner consistent with the Bord na Móna peat rehabilitation plans, where such plans exist or, where there are no such plans the peat would be reinstated on a 'like for like' basis with any surplus provided to Bord na Móna for reuse within their peatland rehabilitation schemes. The aim is to get the post-construction conditions back to the pre-construction conditions in terms of the material and the drainage arrangements.

4.13 Testing and Commissioning

116. During the construction of the Proposed Project, testing and commissioning of individual elements of the works would be carried out at suitable stages of progression. Upon works completion, final commissioning of the whole works would be undertaken to confirm that the system responds in accordance with its specified requirements.

117. Testing of the pipeline would involve temporary water abstractions from eight rivers, and subsequent discharge of this water via the washouts (if the water cannot be retained and pumped into adjacent sections of the pipeline for further testing). Design measures will be in place to mitigate the environmental impact of these abstractions and discharges, including, but not limited to:

- Limiting abstraction velocities to prevent fish being trapped, and the flow of discharge to prevent scour of the receiving watercourse
- Treatment of water to control sediment, chlorine and oxygen levels, and pH
- Preventing the spread of invasive species and microorganisms.

5. Operation

5.1 Introduction

118. A pipeline conveying treated water would operate for many years with little more than routine maintenance of the various valves. All valves would be exercised regularly to check satisfactory operation. It is envisaged that a permanent dedicated team would look after the Treated Water Pipeline, checking all valves at least every six months.

5.2 Energy

119. Uisce Éireann is committed to designing, building and operating energy efficient assets. The plant, equipment, buildings and systems associated with the Proposed Project would be designed, equipped, operated and maintained in such a manner as to ensure a high level of energy performance and that energy is used efficiently.

120. Solar panels would be included at the Water Treatment Plant, Break Pressure Tank, Booster Pumping Station, Flow Control Valve and Termination Point Reservoir to supplement the mains power supply to these sites.

5.3 Drainage

121. Each of the Infrastructure Sites would have a surface water drainage system. These drainage systems have been designed as sustainable drainage systems, using nature based solutions where feasible (such as ditches, ponds and green roofs). The drainage systems have suitable attenuation (features like ponds to hold water before it is discharged to watercourses) to limit discharge rates and mitigate water quality impacts. Attenuation basins would be included at the Water Treatment Plant, Booster Pumping Station, Flow Control Valve and Termination Point Reservoir. An infiltration basin is proposed to be included at the Break Pressure Tank. Drainage systems and attenuation have been designed to take account of future climate change.

122. The drainage systems also include oil interceptors where appropriate to provide protection against accidental spillages.

5.4 Operational Staffing

123. When fully developed and operational, it is expected that approximately 30 full-time equivalent members of staff would be required to operate and maintain the Water Treatment Plant and the Raw Water Intake and Pumping Station. Staff would consist of plant and maintenance managers, control room operatives, and various technicians.

124. Staffing for the operation of the Treated Water Pipeline would be small compared to the staffing levels required for the Water Treatment Plant and Raw Water Intake and Pumping Station. It is, however, expected there would be a small team (less than 10) to look after the pipeline valves, Break Pressure Tank, Booster Pumping Station and Flow Control Valve.

125. The pipeline route would be traversed and all valves, outfall structures and storages would be inspected at six-monthly intervals to check security, valve operation and to ensure no leaks are apparent. These would be planned activities and would be carried out with the prior knowledge of the landowner. The inspection would be carried out in a small van and on foot with access to land being co-ordinated with landowners.

126. The staff currently managing the existing reservoir facility at Peamount would be responsible for the proposed Termination Point Reservoir and no additional staff would be required at this location.

5.5 Operational Management of Water Levels at Parteen Basin

127. ESB manages water levels on Lough Derg and controls the water levels on Parteen Basin by diverting water to Ardnacrusha power station for the production of zero carbon electricity, and by opening gates at Parteen Weir to release water down the old course of the River Shannon.

128. Parteen Basin is a small reservoir, built with earthen Embankment Dams along the south-western and south-eastern perimeter. It is fed from Lough Derg through the narrow river channel at Killaloe.

129. ESB controls the water levels in Parteen Basin by closely matching the amount of water taken by Ardnacrusha and the Old River Shannon with the amount of water flowing into Parteen Basin each day.

130. The water levels on Lough Derg are managed within a Normal Operating Band, and an upper and lower water level limit for Parteen Basin. Parteen Weir acts as the downstream control structure for water levels in the system. Water levels in Parteen Basin are maintained within the upper and lower levels at all times. During low flow conditions, the lower water level at Parteen Basin must be maintained for dam safety purposes and in doing this ESB ensures that water levels in Lough Derg are within the Normal Operating Band as the waterbodies broadly operate as a combined system, in these conditions. During flood conditions, water is discharged down the Old River Shannon to prevent the water level in Parteen Basin exceeding the upper limit.

131. Approximately 90% to 95% of the long-term average annual flow in the Shannon at Parteen Weir (which is approximately 180m^3/s), is directed through Ardnacrusha, with the minimum statutory compensation water flow of 10m^3/s directed to the Lower Shannon at Parteen Weir.

132. The proposed abstraction from the River Shannon would be located on the eastern shore of Parteen Basin. It is proposed to abstract up to a maximum of 3.47m^3/s from Parteen Basin. This represents the projected peak deficit in a drought period, in 2050. Abstraction rates would vary during normal operation up to this maximum, however, more typical abstraction rates would be represented by the average deficit which is projected to be equivalent to 1.78m^3/s in 2050. At the maximum rate of abstraction, the proposed abstraction of water would equate to a small fraction (approximately 2%) of the long term annual average flow through Parteen Basin. The proposed abstraction of water is in essence, an abstraction from water normally used in the hydro-power plant, using the same existing water level controls.

133. ESB will continue to maintain water levels as it does today, within its Normal Operating Band and therefore, ESB will facilitate the proposed abstraction of water by the Proposed Project within its current operating practices. As part of an overall agreement with ESB, water will be diverted to the Proposed Project abstraction from the flow that would otherwise have been used for electricity generation on a continuous year round basis. At a practical level, this will mean that ESB, in keeping the water level within the Normal Operating Band on Lough Derg and within the upper and lower water level on Parteen Basin, will take account of, and respond to, the volume of water abstracted for the Proposed Project, alongside other relevant considerations such as, maintaining statutory compensation flow of 10m^3/s down the Old Shannon channel, predicted rainfall, the demand for power and operating practices. ESB will maintain the water levels within the Normal Operating Band on Lough Derg and within the upper and lower water levels on Parteen Basin, as it does currently. Over longer periods there would be a generalised adjustment of the flow going to Ardnacrusha by ESB to respond to the volume of water used by the Proposed Project. However, the operation of Lough Derg, post works, will feel and look very similar to the way it currently operates, and there will not be a visible day to day difference.

134. The minimum statutory compensation water of 10m^3/s passed through Parteen Weir into the Old River Shannon will remain unchanged and undiminished under this proposal. Navigation and beneficial uses focused on tourism will experience the same operating water level range as normal.

6. Environmental Assessment Process and Methodology

6.1 Introduction

135. Environmental Impact Assessment is the process for evaluating the likely significant effects on the environment caused by a proposed development. Where a development could result in likely significant effects, design or other mitigation measures are proposed to avoid these effects altogether or reduce them to acceptable levels.

136. As the Proposed Project is a development for which the Environmental Impact Assessment process is required, an EIAR has been prepared by competent experts to provide information so that An Coimisiún Pleanála and all stakeholders can understand the likely significant environmental effects of the Proposed Project.

6.2 EIAR Format and Structure

137. The EIAR has been prepared in accordance with relevant legislation and policy, with regard to guidelines from both the Environmental Protection Agency and European Commission on the preparation Environmental Impact Assessment Reports, as well as topic specific guidance. The EIAR examines each environmental topic as a separate chapter, each of which describes the scope and methodology for the assessment, the existing baseline environment, the impacts on that baseline and the likely significant environmental effects that may arise as a result, and the proposed mitigation measures that are being put forward to avoid or reduce these effects.

138. The EIAR includes chapters for the following environmental topics:

- Noise and vibration
- Traffic and transport
- Biodiversity
- Water
- Soils, geology and hydrogeology
- Agriculture
- Air quality
- Climate
- Population
- Human health
- Landscape and visual
- Cultural heritage
- Material assets
- Resource and waste management
- Risk of major accidents and disasters
- Cumulative effects and interactions.

139. Each chapter is supported by technical appendices and figures.

6.3 Environmental Assessment Process

140. The environmental baseline of the Proposed Project and its surroundings has been established for each environmental topic in the EIAR. Data have been collected through consultations with stakeholders, reviews of available data, and detailed specialist surveys and modelling.

141. For each environmental topic chapter, the impact assessment identifies, describes and assesses the likely significant effects which may arise either directly or indirectly from the Proposed Project. Effects are assessed in terms of their significance to give decision makers a measure of the importance, or gravity, of the environmental effect. Impacts can affect the environment in a variety of ways, resulting in effects that can be negative or beneficial, direct, indirect, secondary or cumulative, temporary or permanent, short, medium or long term. For an effect to occur, there needs to be an impact source, pathway and receptor (a sensitive environmental feature or location). Significance of effects is typically determined by assessing the magnitude of the predicted impact (the amount of change) with the sensitivity of the receiving environment (the value or importance placed upon an environmental feature).

142. Mitigation measures aim to avoid, reduce and, where feasible, remedy significant negative environmental effects. The purpose of any mitigation measure is to eliminate the effect or, if that is not feasible, to reduce its significance. The mitigation hierarchy has been applied, whereby effects are avoided in the first instance (for example, by design change, which is referred to as embedded mitigation), and only if they cannot be avoided are measures then proposed to reduce the effect. The significance of effects is then assessed after the application of mitigation (referred to as the residual effect).

143. A Construction Environmental Management Plan has been prepared to support the EIAR which includes the mitigation measures that will be undertaken so as to prevent and reduce environmental effects.

6.4 Natura Impact Statement

144. A Natura Impact Statement has been carried out in line with the requirements of the EU Habitats Directive to assess the potential for any adverse effects on the integrity of any European sites in view of their conservation objectives. Such sites include Special Areas of Conservation, which are selected for habitats and species listed on Annex I and Annex II of the EU Habitats Directive; and Special Protection Areas, which are selected for bird species listed on Annex I of the Birds Directive.

145. The Habitats Directive requires the undertaking of an ‘Appropriate Assessment’ of the implications of a plan or project, alone and in combination with other plans and projects, on the integrity of European sites in view of their conservation objectives. The Natura Impact Statement reports on the Appropriate Assessment for European sites within the zone of influence of the Proposed Project. The Natura Impact Statement concludes that the Proposed Project does not pose a risk of adversely affecting (either directly or indirectly) the integrity of any European site, either alone or in-combination with other plans or projects.

6.5 Water Framework Directive

146. The Water Framework Directive (WFD) is a directive of the European Parliament which establishes a framework for action in the field of water policy. The WFD requires all water bodies to maintain or achieve good ecological status (or good ecological potential where water bodies are heavily modified or artificial).

147. To be compliant with the requirements of the WFD, any activity which has the potential to have an impact on WFD water bodies must be assessed to determine whether it could cause deterioration in the ecological status or potential of a water body. A Water Status Impact Assessment Report has been prepared for the Proposed Project and has been submitted with the planning application. The assessment has concluded that the Proposed Project would not compromise WFD objectives or cause a deterioration in the status of any surface water or groundwater WFD designated water body and/or jeopardise the attainment of good surface water (or good ecological potential) or groundwater status.

7. Consultation

7.1 Consultation Activities

148. Consultation forms an essential part in the development of any infrastructure project. Uisce Éireann has undertaken consultation and engagement with members of the public, communities, landowners, businesses, elected representatives and other stakeholder groups and organisations, throughout the project development.

149. Image 7.1 sets out key phases of consultation that were undertaken in the development of the Proposed Project.

150. Uisce Éireann consulted upon and adopted its National Water Resources Plan, comprising a Framework Plan and four Regional Water Resources Plans (including the Eastern and Midlands Plan).

151. Prior to the adoption of the National Water Resources Plan, the public and stakeholders were consulted on early stages of the project so that the views of these stakeholders could be considered and, where feasible and relevant, fed into the design development of the Proposed Project. Feedback received as part of the public consultation stages at these early stages of the project, in combination with on-the-ground technical and environmental investigations, has formed a key part of the development of the Proposed Project.

152. Uisce Éireann undertook a non-statutory consultation in early 2025 to obtain feedback from stakeholders and members of the public on the Proposed Project, its construction and environmental impacts. The feedback from this consultation has fed into the design development and environmental assessment of the Proposed Project. An Coimisiún Pleanála will carry out a statutory consultation upon receipt of the planning application, as required by planning and development legislation.

7.2 Environmental Impact Assessment Scoping

153. Scoping is the process of determining the content and extent of matters that should be covered in the environmental information submitted to the competent authority (in this case, An Coimisiún Pleanála). Scoping requires the consideration of the nature and likely scale of the environmental effects that could arise from a proposed development and what methods should be used to collect and assess that information. Scoping commences early in the assessment process and informs the content, methods and level of detail to be provided within the EIAR. It is a dynamic and iterative process and was ongoing throughout the development of the EIAR.

154. An EIAR Scoping Methodology Report was issued to stakeholders in November 2023. This set out the proposed scope and methodology for each environmental topic in the EIAR, taking into consideration current legislation, guidance and best practice, progression of the environmental assessment at that time, and ongoing technical consultations. The objectives of the report were to seek agreement from stakeholders on the proposed scope and methodology for the assessment, prior to submission of the EIAR with the planning application to An Coimisiún Pleanála.

155. The environmental assessment has been undertaken in accordance with the EIAR Scoping Methodology Report taking into account the responses received and any subsequent feedback from the non-statutory consultation held in early 2025. Where there is a change in approach since the EIAR Scoping Methodology Report was published, this is clearly set out in the EIAR.

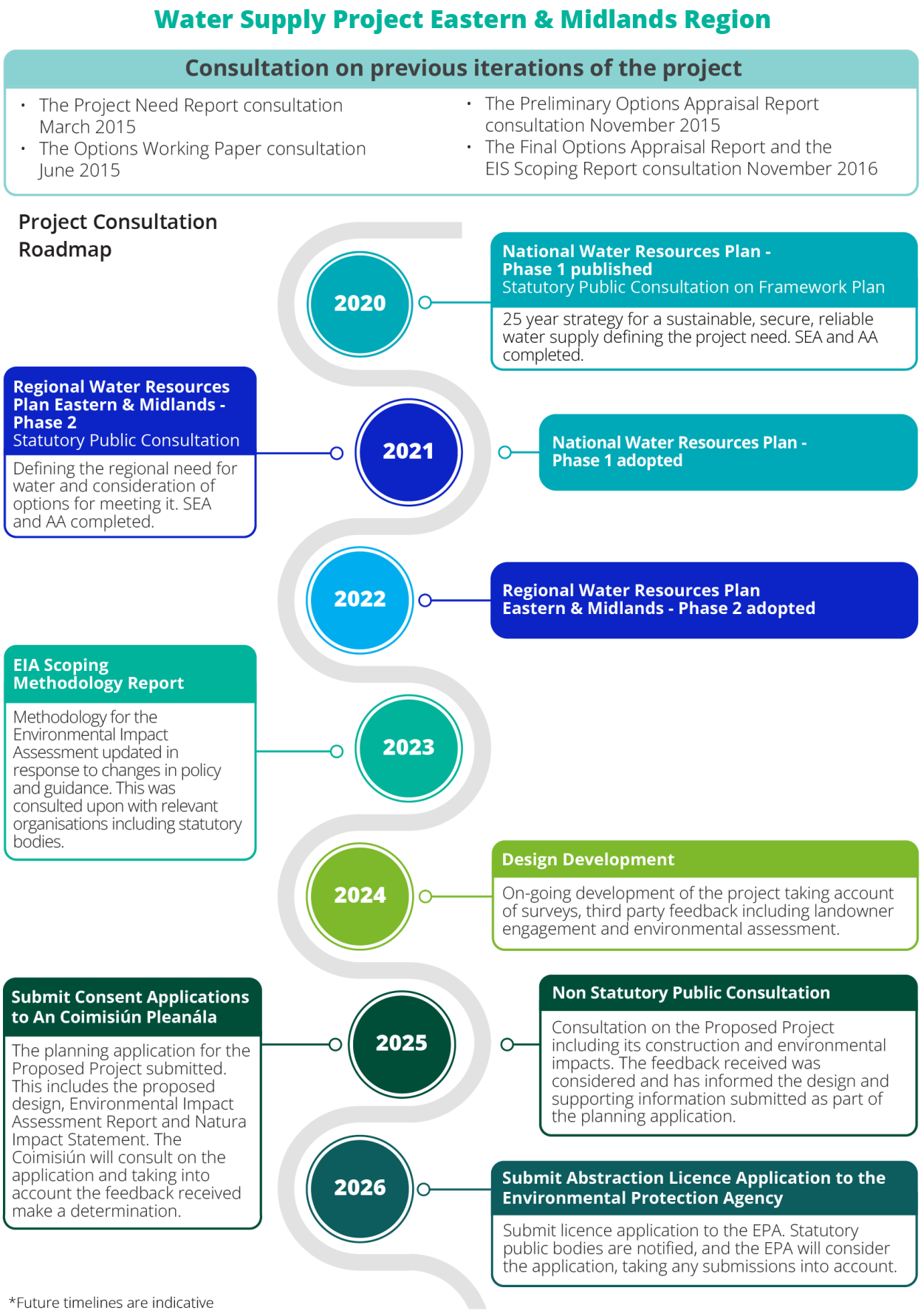

Image 7.1: Proposed Project Roadmap

8. Environmental Assessment

156. This section summarises the baseline, construction impacts, operational impacts, mitigation and residual effects for each environmental topic covered in the EIAR.

8.1 Noise and Vibration

8.1.1 Baseline

157. The noise and vibration assessment completed for the Proposed Project has established the baseline noise environment through the completion of baseline noise monitoring. The results of the monitoring have been used to identify the appropriate noise thresholds during both construction and operation of the Proposed Project.

158. As part of establishing the baseline noise environment for the Proposed Project, noise surveys were completed at various noise sensitive locations along the Proposed Project to give an indication of the overall baseline noise climate. It was identified that, depending on the location of the development, the noise climate was similar to that commonly experienced in rural and semi-rural areas. Certain locations experienced higher ambient noise levels, for example locations adjacent to busy roads.

8.1.2 Construction

159. During construction, key construction activities that would give rise to potential significant effects are groundbreaking, earthworks, earthworks haulage and trenchless crossings. There would also be noise associated with the movement of machinery and materials within, to and from the Construction Compounds and Pipe Storage Depots. The Proposed Project has been designed to reduce impacts from noise through careful site selection away from noise sensitive locations, restricting night-time heavy goods vehicle movements and limiting construction durations where feasible. Even with these embedded design measures, there would be potential significant effects due to noise from construction activities in the absence of mitigation measures. These include:

- Significant, temporary noise levels from the construction of one Construction Compound and five Pipe Storage Depots where noise sensitive locations are nearby
- Significant, short-term noise levels from the construction of the Termination Point Reservoir, which would affect noise sensitive locations within Peamount Hospital close to the boundary of the Termination Point Reservoir
- Significant, temporary noise levels at two noise sensitive locations close to the Termination Point Reservoir access road construction
- Significant, short-term noise levels at one noise sensitive location along the pipeline where piling would occur due to working in peat
- Significant, short-term noise levels which would occur during night-time working that is required at 15 trenchless crossing locations where noise sensitive locations are nearby
- Significant, short-term vibration levels which would occur from piling, rock break out, and trenchless crossing activities, resulting in disturbance on occupants of homes.

160. Mitigation will be implemented to reduce these effects (see Section 8.1.4).

8.1.3 Operation

161. During operation, there would be noise emissions at the Infrastructure Sites. This is due to machinery and equipment that would be required to serve the processes carried out within each site. However, these levels would be below noise level thresholds, and therefore there would be no likely significant effects due to noise and vibration during operation.

8.1.4 Mitigation

162. Key mitigation measures for the Proposed Project aimed at reducing significant noise and vibration effects include, but are not limited to:

- Selection of quiet and low vibration plant, and locating noisy and high vibration generating plant and activities away from sensitive locations where feasible
- Controlling noise at source – for example localised screening and turning off plant when not in use
- Use of noise screening around site boundaries, and around noisy items of plant
- Limiting hours of work and reducing the duration of noisy and high vibration activities, where feasible
- Noise monitoring throughout the Construction Phase.

163. All mitigation measures, including those set out above, are included in a Noise and Vibration Management Plan. The Contractor appointed by Uisce Éireann will be required to follow all measures outlined in the plan.

8.1.5 Residual Effects

164. The implementation of mitigation measures would reduce the likely significant effects at the majority of areas identified where impacts occur during construction. However, there would be likely significant residual effects at:

- Noise sensitive locations within 30m of three Pipe Storage Depots, which would experience temporary noise effects from setting up the depots
- Noise sensitive locations within 190m of 12 trenchless crossing locations with night-time works, which would experience short-term noise effects.
- Three vibration sensitive locations close to rock breaking and trenchless crossing activities, which would experience short-term vibration effects.

165. There would be no likely significant residual effects during operation of the Proposed Project.

8.2 Traffic and Transport

8.2.1 Baseline

166. The Proposed Project includes Haul Roads which are set roads to be used by construction vehicles travelling to and from a construction site and include national, regional and local roads. Haul Roads are located in the administrative areas of seven Local Authorities: Clare County Council, Limerick City & County Council, Tipperary County Council, Offaly County Council, Laois County Council, Kildare County Council and South Dublin County Council. Modelling has been undertaken to predict the increase in vehicles and heavy vehicles using the Haul Roads as a result of constructing the Proposed Project.

167. Haul Roads used for the Proposed Project would interact with junctions. New site access junctions, such as those used to access Construction Compounds and Pipe Storage Depots, would also be created. Modelling has been used to model the expected generated traffic and percentage increase in flows for light vehicles (cars), shuttle buses and heavy vehicles (for example, lorries) during construction and operation of the Proposed Project. Modelling has also been carried out to determine the junctions which could exceed their design capacity and have delays or queues during construction and operation due to their use as Haul Roads.

168. The assessment also considers the impact on pedestrians and cyclists from the proposed Haul Roads.

169. To support the assessment, traffic surveys have taken place to understand existing traffic flows. Site visits have also been undertaken along the Haul Roads to collect data on, for example, the existing condition of the roads.

8.2.2 Construction

170. During construction, key activities which would give rise to potential significant effects include:

- Establishment of Construction Compounds and Pipe Storage Depots
- Construction of site roads, temporary access roads, Lay-Bys and six Infrastructure Sites
- Delivery of materials to site and removal of surplus materials and waste from site
- Construction workers travelling to and from each site
- Site demobilisation and reinstatement.

171. The Proposed Project has been designed to reduce impacts from traffic and transport through careful selection of Haul Roads based on discussion with Local Authorities, the use of trenchless crossings to avoid closure or traffic management on major roads, and the design of Infrastructure Sites to include sufficient parking and space at junctions. Even with these embedded design measures, there is potential significant effects due to traffic and transport from construction activities in the absence of mitigation measures. These include:

- Significant effects along six Haul Roads due to an increase in traffic using the roads during peak periods
- Significant effects at three junctions due to an increase in queue length and delay time during peak periods.

8.2.3 Operation

172. During operation of the Proposed Project there would be limited potential for impacts on traffic and transport. The relevant activities would be the movement of maintenance or other operation vehicles, operatives travelling to and from Infrastructure Sites and the removal of residual water treatment sludge from the Water Treatment Plant. However, traffic levels for these activities are expected to be much lower than construction traffic levels and therefore no potential significant effects on traffic and transport have been identified during operation.

8.2.4 Mitigation

173. Key mitigation measures for the Proposed Project aimed at reducing significant traffic and transport effects include, but are not limited to:

- Use of temporary signals to manage delays at certain junctions during peak construction activity
- Limiting heavy vehicle movements to reduce congestion risks
- Timing restrictions for heavy vehicles near sensitive areas such as schools
- Sufficient parking spaces will be provided at the Infrastructure Sites, Construction Compounds and Pipe Storage Depots. Parking will not be permitted along the side of any road.

174. All mitigation measures, including those set out above, are included in a Traffic Management Plan. The Contractor appointed by Uisce Éireann will be required to follow all measures outlined in the plan.

8.2.5 Residual Effects

175. The proposed mitigation would reduce or avoid the potential significant effects on the majority of Haul Roads and junctions. However, there would be significant residual effects during construction at three junctions due to an increase in queue lengths and delays, and three Haul Roads due an increase in vehicles using the roads. These effects would be temporary in duration, limited to peak periods of construction.

8.3 Biodiversity

8.3.1 Baseline

176. There are 19 European sites (Special Areas of Conservation and Special Protection Areas) that have an impact pathway to the Proposed Project. Of these, only one site – the Lower River Shannon Special Area of Conservation – would be within the boundary of the Proposed Project. There are also 11 Natural Heritage Areas (which do not overlap with a European site) that have an impact pathway to the Proposed Project, none of which are located within the boundary of the Proposed Project.

177. In general, the majority of the habitats within the Proposed Project boundary consist of improved agricultural grassland and arable crops, linear hedgerows and treelines, with areas of cutover bog (peatland where some but not all of the peat has been removed), pockets of forestry and smaller pockets of more natural habitats of higher ecological value such as riparian woodland. At the Infrastructure Sites, the habitats mainly consist of improved and wet grassland and smaller pockets of broadleaved woodland and conifer plantation. The Proposed Project crosses numerous small streams and larger rivers.

178. To support the assessment, multiple surveys have taken place relating to biodiversity. This includes surveys for habitats and plants (both terrestrial and aquatic), multiple mammal species (including bats, badgers and otter), invertebrates, multiple aquatic species, invasive non-native aquatic and terrestrial species, breeding birds and wintering birds.

8.3.2 Construction

179. The Proposed Project has been designed to reduce the effect on biodiversity as far as feasible. With the exception of the Lower River Shannon Special Area of Conservation, the Proposed Project avoids all designated European sites. Non-designated habitats that meet the criteria of Annex I habitats (protected under the Habitats Directive) were also avoided during the route selection process and habitats of high suitability for protected species were avoided where feasible.

180. During construction, in the absence of protective mitigation measures, there is potential for significant effects to European sites, Natural Heritage Areas, and aquatic and terrestrial habitats and species. This is due to impacts such as habitat loss and fragmentation (when larger, continuous habitats are broken up into smaller, isolated patches), habitat degradation (a decrease in a habitat condition as a result of, for example, pollution of surface water or groundwater, air quality, or spread of invasive non-native species), disturbance/displacement (such as from noise impacts), mortality risk, and barrier effect (an obstacle that restricts the movement of a species).

181. The proposed construction works would result in the loss of five bat roosts (one derelict building and four trees), the disturbance of three otter holts, and the loss of 33 badger setts located within the Proposed Project boundary. Derogation licences are required from the National Parks and Wildlife Service for the removal of the bat roosts and disturbance of the otter holts. Licence applications have been submitted.

182. The route of the Proposed Project has been carefully positioned to reduce the number of watercourse crossings as far as feasible. To reduce impacts on aquatic habitats and species, trenchless crossing techniques would be used to go underneath major watercourses, while the excavation for the Raw Water Intake and Pumping Station would be isolated from Parteen Basin by a temporary piled formation to reduce water quality impacts. Even with these embedded mitigation measures, there is potential for significant effects on Parteen Basin, watercourses, and aquatic species during construction in the absence of mitigation measures, due to working in watercourses, potential pollution, and spread of invasive non-native species.

183. There are potential significant effects on breeding bird species and wintering bird species in the absence of mitigation measures due to habitat loss and fragmentation, habitat degradation as a result of reduced quality of foraging habitat, and disturbance/displacement as a result of construction activities such as movement of machinery and the associated noise with these activities. One confirmed barn owl nest site would be lost within the Proposed Project boundary.

184. Mitigation measures have been proposed to reduce these effects (see Section 8.3.4).

8.3.3 Operation

185. Once the Proposed Project is operational, potential impacts that could result in significant effects to both aquatic and terrestrial biodiversity, in the absence of mitigation measures, include spills and leaks of pollutants into surface or groundwater during maintenance activities, pollution risk from leaks and emergency or non-emergency discharges of treated water from the pipeline into surface or groundwater, and light disturbance from the Infrastructure Sites, which would impact nocturnal species such as bats. Mitigation measures have been proposed to reduce these effects (see Section 8.3.4).

186. Hydrological modelling has demonstrated that there would be no significant effect on water levels and the flow regime either upstream or downstream of the Proposed Project abstraction from Parteen Basin (see Section 8.4), therefore, the proposed abstraction would not have a likely significant effect on the qualifying interest habitats or species of the Lower River Shannon Special Area of Conservation. Embedded mitigation is included in the design to avoid effects on aquatic ecology within Parteen Basin, including intake screens at the Intake Chamber of the Raw Water Intake and Pumping Station to prevent the spread and transfer of zebra mussels and a bubble curtain to act as a barrier discouraging fish from entering the intake.

8.3.4 Mitigation

187. A comprehensive range of mitigation measures is proposed to avoid or reduce the potential impacts of the Proposed Project on biodiversity. Monitoring will be undertaken. Key mitigation measures for biodiversity aimed at reducing significant effects include, but are not limited to:

- A suitably qualified Ecological Clerk of Works will oversee and implement all mitigation measures
- Multidisciplinary pre-construction surveys will be conducted
- Vegetation removal will be seasonal, and mature trees and hedgerows will be retained where feasible
- Provision of a bat house (Image 8.1), bat boxes, artificial badger setts, and a barn owl nest box
- Lighting design to best practice to reduce light spill
- Habitat reinstatement and landscape planting will use locally sourced native species on a like-for-like basis (subject to planting restrictions within the 20m Permanent Wayleave)
- Biosecurity protocols will be implemented, included in an Invasive Species Management Plan
- Controls and features have been designed into the process of discharging from Washout Valves to control scour and prevent water quality impacts

- Surface water management and pollution prevention measures implemented through a Surface Water Management Plan (see Section 8.4.4)
- Working within a double heavy-duty silt curtain to avoid the risk of pollution to Parteen Basin.

Image 8.1: Example of a Bat House

8.3.5 Residual Effects

188. Through the implementation of well-established approaches to mitigation, which will be implemented in accordance with best practice guidance, it would be possible to reduce the impacts so as not to result in significant effects for the majority of ecological receptors. However, even after the application of mitigation measures, there would be likely significant negative residual effects on the following ecological receptors:

- Terrestrial habitats during construction due to the permanent loss of habitat within the Infrastructure Sites, access roads, and other permanent infrastructure such as valves
- Short-term likely significant negative residual effects on bats at a local level during construction due to loss of five roosts and construction activities resulting in loss and fragmentation of habitat
- Short-term likely significant negative residual effects on badger at a local level during construction due to the loss of 33 setts.

8.4 Water

8.4.1 Baseline

189. The Proposed Project traverses seven water catchments, including four Lower Shannon catchments; the northernmost part of the Barrow catchment; the south-east tip of the Boyne catchment; and the western edge of the Liffey and Dublin Bay catchment. There are 56 WFD designated water bodies identified as being potentially at risk of impacts as a result of the Proposed Project. The WFD is an EU directive aimed at protecting and improving the quality of all types of water bodies in EU member states. The majority of the 56 water bodies are currently classified as being of Moderate or Poor status.

190. The Proposed Project could potentially impact important amenity areas, notably Lough Derg and Parteen Basin (also known as the Lower Lake), where the Proposed Project abstraction is located. These water bodies support a range of activities including fishing, boating, canoeing, water skiing, kayaking, surfing and sub-aqua diving.

191. Extensive depth and water quality surveys have been undertaken to characterise the baseline of Lough Derg and Parteen Basin to provide information to support specialist hydrological and water quality modelling studies that have been undertaken as part of the assessment of the Proposed Project abstraction.

8.4.2 Construction

192. Without the implementation of standard good practice construction measures and mitigation, the assessment identified a number of activities that could potentially result in significant effects during the construction and commissioning of the Proposed Project. Such activities include:

- Installation of the pipeline at watercourse crossings (over 500 in total, including small drainage ditches), requiring temporary diversion of stream flow, and localised removal of bankside features and vegetation
- Discharge of construction drainage water from temporary working areas, potentially containing high concentrations of sediments and other pollutants
- Discharge of drainage water from temporary working areas through peatlands, which has potential for high levels of sediment, ammonia and organic pollution
- Potential leaks and spills, such as oil and fuels from construction sites
- Culverting of watercourses at some of the Infrastructure Sites
- Temporary abstractions from selected watercourses along the pipeline route to provide water for pressure testing of the pipe just prior to commissioning; without mitigation, potential significant effects could arise due to temporary reduced watercourse flows
- Discharge of pollutants via pipeline washouts following completion of the pressure testing and pipeline commissioning
- Mobilisation of contaminants at previously polluted sites, for example there is a disused petrol station which would be demolished to make way for the Water Treatment Plant access road.

193. Mitigation will be implemented to reduce these effects (see Section 8.4.4).

8.4.3 Operation

194. The operation of the Proposed Project includes the abstraction and treatment of water from Parteen Basin for onward transmission to Dublin. Extensive hydrological and water quality modelling studies have been undertaken to simulate potential impacts on water levels and water quality in Lough Derg, Parteen Basin and the downstream Lower Shannon, to determine the acceptability of the proposed abstraction rate for the Proposed Project.

195. The modelling tested a range of scenarios for the water abstraction, including worst case conditions with the proposed peak abstraction (300Mld) under drought conditions (using the year 2018 as the worst case drought over the past 50 years) and with future climate change included. The hydrological modelling demonstrated that even during the worst modelled drought event (2018), the size and rate of simulated lake level change fits within the range of normal lake level fluctuations seen within the 52-year period of historical recorded levels. The simulated lake levels with the inclusion of the Proposed Project abstraction are still well within the Normal Operating Band on Lough Derg and within the upper and lower water level on Parteen Basin, and would mean that the compensation and fish pass flows to the downstream Old River Shannon would still always be met.

196. The water quality modelling showed the changes in water quality across the lough, under worst case drought conditions, to be miniscule compared to the monitored baseline conditions. The predicted differences, both spatially (across the lough) and temporally (monthly variation), would be less than the natural variability in the system. The overall conclusion of the modelling studies was that the Proposed Project would have a neutral effect on the water quality of Lough Derg and Parteen Basin, thus demonstrating that the Proposed Project would have no significant effects on the amenity value of Lough Derg, Parteen Basin or the downstream Lower River Shannon.

197. The operation of the Proposed Project also includes the use of Washout Valves along the Treated Water Pipeline. These are required for maintenance purposes or for use during an emergency situation but would very rarely be used (approximately once every 20-30 years). Nevertheless, they have been designed to avoid any significant effects from either the volume or rate of flow of the discharges, or from water quality impacts (dechlorination would be provided prior to discharge). Similarly, additional temporary washouts that would be needed during the commissioning phase would also be provided with measures to prevent water quality or flow impacts on receiving waters.

8.4.4 Mitigation

198. Key embedded mitigation measures for water include the detailed modelling studies described above to determine an acceptable abstraction rate from Parteen Basin, locating the Infrastructure Sites to avoid sensitive water features, the use of trenchless crossings to go underneath main watercourses, the design of permanent Washout Valves to reduce impacts from flow volumes and to include dechlorination facilities, and the inclusion of sustainable drainage systems in the design of the Proposed Project.

199. Key additional mitigation measures for water to reduce potential significant effects include, but are not limited to:

- Using good practice measures during construction to control, treat and hold silt-laden runoff and water from excavation activities and site drainage; this includes the use of attenuation sediment lagoons across the temporary working areas to trap sediment before discharge to watercourses
- Working within a double silt curtain (a vertical barrier used in water to contain sediment and allow it to settle) at Parteen Basin to avoid the risk of pollution from construction activities at the Raw Water Intake site
- Monitoring of water quality and implementation of additional treatment where necessary, before discharge to water bodies
- Use of appropriate buffers between water bodies and construction works
- Development of detailed methodologies for working within watercourses, including seasonal working to avoid potential impacts on migratory fish
- Setting limits for discharge rates, suspended solids and chlorine from water discharges as a result of the operation of Washout Valves.

200. All mitigation measures, including those set out above, are included in a Surface Water Management Plan. The Contractor appointed by Uisce Éireann will be required to follow all measures outlined in the plan.

8.4.5 Residual Effects

201. The proposed mitigation would reduce or avoid the potential significant effects. There would therefore be no likely significant residual effects as a result of the construction or operation of the Proposed Project.

8.5 Soils, Geology and Hydrogeology

8.5.1 Baseline

202. Soils, geology and hydrogeology includes the assessment of underlying geology including protected geological sites, soil resources, contaminated land and groundwater. To support the assessment, extensive field surveys, ground investigations (boreholes), geophysical surveys (non-invasive surveys, for example ground penetrating radar), well surveys and groundwater monitoring have been undertaken.

203. Five geological heritage sites were identified along the Proposed Project, including three eskers (long, narrow, gravel ridges). However, no surface features from these are evident within the boundary of the Proposed Project. There are nine karst features (sinkholes, caves and underground drainage systems formed by the dissolution of soluble rocks) located within 2km of the Proposed Project.

204. A range of soil types are present throughout the Proposed Project. Peat is a predominant soil group, although surveys have confirmed there are no active raised bogs (the most valuable peatland habitat) present within the boundary of the Proposed Project, with the majority comprising cutover bog (where some or all of the peat has been removed). There are some small areas of degraded raised bog not capable of natural regeneration along the pipeline route. Approximately 53km of the pipeline passes through peatlands, a substantial proportion of which are lands owned by Bord na Móna. The pipeline is routed through eight bogs which are included in Bord na Móna's Rehabilitation Plans, including some that have enhanced rehabilitation plans under the Peatlands Climate Action Scheme. The Peatlands Climate Action Scheme provides for the restoration and rehabilitation of Bord na Móna peatlands that were previously harvested.

205. The Fort Henry Embankment, which forms part of the Parteen Basin impoundment, is located 60m south of the Raw Water Intake and Pumping Station and is therefore an important geohazard consideration, to ensure that construction works do not impact on the stability of the embankment.

206. There are records of potential contaminated land sites within 1km of the Proposed Project, including a disused petrol station at the proposed Water Treatment Plant access road, and potential for ground contamination due to historical mining at Silvermines. However, no significant potential contamination risk was identified within the boundary of the Proposed Project.

207. The Proposed Project is located close to a number of groundwater abstractions for water supply. The pipeline is located in close proximity to the O'Brien's Bridge Public Water Scheme, Ballinagar Group Water Scheme, the Geashill Public Water Scheme, Ardcrony Group Water Scheme, and the Mount Lucas Group Water Scheme. There are five private wells within 50m of the pipeline route.

208. No groundwater dependent terrestrial ecosystems have been identified that would be likely to be significantly impacted by the Proposed Project.

8.5.2 Construction

209. Measures have been embedded into the design to reduce the impact on soils, geology and hydrogeology. These include avoiding sensitive features, such as active raised bog, during the site selection process for the Proposed Project; development of discrete methods of working in peat; and pre-construction stabilisation of a potential karst feature at the Break Pressure Tank site.

210. Despite these design measures, there is potential for significant short-term effects during construction from the following, prior to the implementation of mitigation measures:

- Compaction and loss of peat at small areas of degraded raised bog along the pipeline route
- Potential temporary groundwater flow effects from dewatering (pumping of groundwater from excavations) during installation of the Treated Water Pipeline at Ballinagar Group Water Scheme.

211. Mitigation will be implemented to reduce these effects (see Section 8.5.4).

8.5.3 Operation

212. No likely significant effects have been identified from the operation and maintenance of the pipeline and Infrastructure Sites, as operational activities would not result in any significant disturbance of soil or impacts to groundwater.

8.5.4 Mitigation

213. Key mitigation measures for soils, geology and hydrogeology to reduce significant effects include, but are not limited to:

- Good practice measures for soil stripping, handling, storage and reinstatement, as set out in a Soils Management Plan
- Peat material will primarily be used for reinstatement following installation of the pipe; it has been agreed with Bord na Móna that any surplus peat would be available for beneficial reuse for Bord na Móna's bog rehabilitation plans
- Ensuring water supply from groundwater abstractions is maintained
- Surface water management and pollution prevention measures implemented through a Surface Water Management Plan (see Section 8.4.4)
- Monitoring of groundwater levels and groundwater quality at Ballinagar Group Water Scheme; Geashill Public Water Scheme; Ardcrony Group Water Scheme; private wells within 100m of the pipeline; and at the Fort Henry embankment.

8.5.5 Residual Effects

214. The implementation of mitigation measures would reduce the likely significant effects at the majority of areas identified where impacts could occur during construction. However, there would be residual significant short-term effects on a small number of degraded raised bog areas during construction due to soil compaction and loss of peat. Effects on these areas of degraded raised bog would not be significant in the long-term as the peat would be reinstated following construction. No other residual significant effects are likely after the implementation of mitigation measures.

8.6 Agriculture

8.6.1 Baseline

215. Along the pipeline route, the primary land use is agriculture, with the Proposed Project infrastructure crossing over 400 agricultural landholdings. The main farm enterprises are drystock (including beef and sucklers), dairy, and grassland-based farming. Some areas also support arable farming, with crops including winter wheat, winter barley, and spring barley, particularly in counties with higher soil quality such as Kildare and Dublin. There are some intensive equine enterprises in operation along the pipeline route.

216. The land associated with the Proposed Project predominantly comprises fine loamy soils, which are well-suited for agriculture due to their favourable drainage and nutrient retention characteristics. Peat soils are also prevalent, especially in the Midlands, and are typically poorly drained and less suitable for productive agricultural use.

217. To support the assessment, multiple surveys have taken place in relation to agriculture by suitably qualified personnel. These include farm visits, face-to-face interviews with landowners, and roadside surveys.

8.6.2 Construction

218. The Proposed Project has been designed to reduce the effect on agriculture as far as feasible. The pipeline would be installed in sections to minimise disruption to individual landowners. However, the main impact during construction is the reduction in land and productivity for areas within the Construction Working Width, Infrastructure Sites, Construction Compounds and Pipe Storage Depots. This land-take arises at the Construction Phase but would be permanent in respect of the Infrastructure Sites.

219. Prior to mitigation, there would be over 400 agricultural landholdings that would be directly impacted by the pipeline, most of which would have potential significant effects, in the absence of mitigation, due to temporary land-take during construction. There would be 16 agricultural landholdings that would have potential significant effects due to permanent land-take from the Infrastructure Sites. There would also be 15 equine only enterprises that would have potential significant effects due to being directly or indirectly impacted by pipeline infrastructure.

220. Mitigation measures have been proposed to reduce these effects (see Section 8.6.4).

8.6.3 Operation

221. Measures have been embedded into the design to reduce the permanent impacts on agriculture during operation. This includes routing the Pipeline Corridor adjacent to field and property boundaries, where feasible, and facilitating or partially facilitating requests from landowners to adjust the alignment of the pipeline in order to reduce impacts. Valves have been located as close to field boundaries as feasible to reduce disturbance to farming operations. Despite these design measures, the following impacts would occur during operation in the absence of mitigation measures:

- Permanent loss of land at the Infrastructure Sites and above ground pipeline infrastructure (such as valves)
- Restriction on land use, such as planting trees, within the 20m Permanent Wayleave
- Exclusion areas around power connection infrastructure restricting use of some deep soil machinery such as the plough
- Disturbance to farming operations due to maintenance work
- Sub-division of land due to construction of access roads for Infrastructure Sites
- Damaged or interrupted drainage systems
- Loss of shelter such as hedgerows
- Decrease in land condition and productivity
- Spread of noxious weeds, invasive species and animal diseases due to ground and habitat disturbance.

222. These impacts would not result in likely significant effects. Regarding the first bullet point, the permanent removal of agricultural land during operation is limited to the Infrastructure Sites and areas where above ground pipeline infrastructure such as Line Valves are located. This land would have already been taken during the Construction Phase to build the Infrastructure Sites and would therefore no longer be in agricultural use. Maintenance work would only cause brief disturbance to farming operations during operation. Therefore, the operation of the Proposed Project, prior to mitigation, would not result in likely significant effects on agriculture, save for equine (see below).

223. There would, however, be likely significant effects during operation at six equine only enterprises prior to mitigation. This is due to the potential locations of above-ground infrastructure and the associated risk of injury or harm to bloodstock if such infrastructure is not appropriately cordoned off. Mitigation measures have been proposed to reduce these effects (see Section 8.6.4).

8.6.4 Mitigation

224. Key mitigation measures for reducing significant effects on agriculture include, but are not limited to:

- Crossing points will be agreed and suitable access arrangements will be provided which will accommodate the landowner while at the same time facilitating the construction of the Proposed Project
- Active engagement with landowners will take place during construction
- All agricultural lands will be reinstated to pre-construction conditions
- Disease protocols and farm biosecurity measures will be adhered to at all times
- Above ground infrastructure will be fenced off in accordance with equine industry standards to ensure safety for grazing and exercising horses.

8.6.5 Residual Effects

225. Following mitigation, the number of significant effects on agricultural landholdings is reduced. However, even after the application of mitigation measures there would be short-term likely significant residual effects on 181 agricultural landholdings due to construction of the pipeline and associated pipeline infrastructure, and on eight landholdings due to permanent loss of land from the Infrastructure Sites. There would be likely significant residual effects on 12 equine only enterprises during construction. No residual significant effects have been identified from constructing for the 38 kV Uprate Works.

226. During operation of the Proposed Project, there would be a likely significant residual effect on one equine only enterprise.

8.7 Air Quality

8.7.1 Baseline

227. Existing air quality across the Proposed Project study area has been found to be substantially below the air quality limit for nitrogen dioxide (a pollutant from vehicle exhausts which is harmful to human health and the environment) and particulate matter (particles between 10 and 2.5 micrometres in diameter that can damage health if inhaled over an extended period of time). This indicates that air quality in the area of the Proposed Project is generally good.

228. The air quality assessment considers potential air quality effects on ecological sensitive areas that are within 200m of Haul Roads that would be used by the Proposed Project during construction, where the increase in traffic using the roads could impact the sites due to changes in air quality. The ecological sensitive areas assessed are the Lower River Shannon Special Area of Conservation, River Barrow and River Nore Special Area of Conservation, Kilcormac Esker proposed Natural Heritage Area, and Grand Canal proposed Natural Heritage Area.

8.7.2 Construction

229. The Proposed Project involves material handling activities (such as excavation) which typically emit dust. The Proposed Project also includes the demolition of five buildings, an activity which would generate dust. These buildings include a farm shed located toward the centre of the Water Treatment Plant site and three buildings associated with a disused petrol station at the Water Treatment Plant access road. A further barn would need to be demolished in order to provide an access over the Grand Canal to the Construction Working Width.

230. The Proposed Project has included embedded design measures to avoid potential significant dust effects to nearby sensitive locations by locating site compounds away from residential areas and reviewing site compound layouts to reduce dust emissions as much as feasible. The assessment identifies the construction activities which are likely to generate dust and identifies mitigation to reduce the effect of dust on the population around the pipeline and Infrastructure Site locations (see Section 8.7.4). In addition to measuring the impact of dust and particulate matter, the assessment also considers fungus, specifically Aspergillus spp. which may be present in soil and may negatively affect individuals who are immunosuppressed.

231. The traffic associated with the Construction Phase of the Proposed Project would lead to an increase in traffic-related pollutant emissions. The assessment has modelled pollutant levels at sensitive receptor locations (residential housing and sensitive ecological areas) close to construction Haul Roads. This allowed the impact of construction traffic emissions to local air quality to be calculated. The modelling has demonstrated that there would be no likely significant effects from traffic-related pollutant emissions on human health or sensitive ecological areas.

8.7.3 Operation

232. The operation of the Proposed Project would not include any significant dust or air pollutant producing activities. There would therefore be no likely significant effects during operation.

8.7.4 Mitigation

233. Key mitigation measures for traffic related air emissions include, but are not limited to:

- Applying the traffic management measures set out in the Traffic Management Plan (see Section 8.2.4)
- Not allowing idling of vehicles both on and off site, including heavy vehicle holding sites
- Efficient scheduling of deliveries to reduce trips as far as feasible
- Construction vehicles will meet or exceed, where feasible, the current EU emissions standards. This will reduce emissions on Haul Roads.

234. Established mitigation measures will be used to control dust emissions during construction, such as dampening down of surfaces, careful siting of dusty activities as far from sensitive locations as feasible, and erecting screens or barriers around the dust-causing activities. These measures are included in a Dust Management Plan which will be followed by the Contractor appointed by Uisce Éireann. There will be monitoring of dust deposition levels throughout construction of the Proposed Project.

8.7.5 Residual Effects

235. Dust mitigation involves use of established measures that are highly effective at controlling dust emissions. Therefore, after the implementation of the mitigation measures, the Proposed Project would result in no likely significant residual effects.

236. The modelling assessment has determined that there would be no likely significant residual effects from traffic-related pollutant emissions.

8.8 Climate

8.8.1 Baseline

237. The climate assessment has identified greenhouse gas emissions without the Proposed Project for both now and into the future. Data published by the Environmental Protection Agency shows that Ireland exceeded its greenhouse gas emission target in 2024 (although levels were lower than in 1990), with the highest emissions from the transport and agriculture sectors.

238. The region that the Proposed Project would be located in has a temperate, oceanic climate, resulting in mild winters and cool summers. A noticeable feature of the recent weather in the region has been an increase in the frequency and severity of storms and heavier rainfall events. Weather extremes are expected to become more likely and more frequent with future climate change.

8.8.2 Construction

239. During construction, the main risk to climate would be from embodied carbon in construction materials, loss of carbon sinks such as forestry and peat, and the greenhouse gas emissions from construction vehicles. Design measures are embedded into the Proposed Project to reduce carbon emissions during construction, such as reducing the amount of materials, and therefore embodied carbon, required to construct the Proposed Project and in turn reducing construction traffic to reduce carbon from vehicle emissions. However, further mitigation measures are required to reduce construction carbon to bring the Proposed Project in line with the national carbon target to be carbon net zero by 2050 (see Section 8.8.4).

8.8.3 Operation

240. During operation, the main risk to climate would be carbon emissions from power requirements. Design measures are embedded into the Proposed Project to reduce carbon emissions during operation, such as improving energy efficiency, including solar panels at the Infrastructure Sites, recycling wastewater within the Water Treatment Plant, and optimising the design (for example, by only using a single Treated Water Pipeline, therefore reducing embodied carbon from manufacturing the pipe). As with construction, further mitigation measures are required to reduce operational carbon to align with the national carbon target to be carbon net zero by 2050 (see Section 8.8.4).

241. The vulnerability of the Proposed Project to future climate change is also assessed in relation to various climate hazards such as flooding, extreme temperatures and winds. The risk of significant effects on the Proposed Project from the various climate change hazards was assessed as ‘low risk’. This is due to embedded mitigation, such as locating the Proposed Project outside areas at risk of flooding, where feasible. There would therefore be no likely significant effects due to climate change vulnerability.

242. One of the most significant potential vulnerabilities to the Proposed Project is the risk that future abstraction from Parteen Basin is not viable at the proposed rates due to droughts or other climate related hazards. However, as discussed in Section 8.4.3, the results of the hydrological modelling show that the abstraction is not considered likely to result in a significant effect on any of the surface water receptors, including during a drought or as a result of the reasonable worst case climate change scenario.

8.8.4 Mitigation

243. Key mitigation measures aimed at reducing the impact on climate include, but are not limited to:

- Use of a low carbon concrete to reduce embodied carbon from concrete
- Using hydrotreated vegetable oil in construction plant and equipment instead of diesel to reduce carbon emissions from construction vehicles, and using electric construction equipment where feasible
- Use of recycled materials to reduce the embodied carbon from new materials
- Using renewable energy for Construction Compounds connected to the electricity grid (rather than using diesel or petrol generators), and 100% renewable energy for operational power requirements
- Developing and applying a Carbon Management Plan to inform the detailed design, build and operation of the Proposed Project.

244. The Proposed Project will also comply with the requirements set out in the national Climate Action Plan, such as procuring from national suppliers that meet the carbon reduction targets set out in the Climate Action Plan.

8.8.5 Residual Effects

245. The Proposed Project can be considered to align with Ireland's trajectory towards net zero by 2050 as the proposed mitigation measures would reduce the construction and operation carbon emissions. The Proposed Project would enable resilience through climate adaptation with a more sustainable water supply to the Eastern and Midlands Region, which can be seen as beneficial in the long term. The Proposed Project is considered to be in alignment with the national climate objective and policy (such as the Climate Action Plan), therefore, after the implementation of mitigation measures, the Proposed Project would result in no likely significant residual effects.

8.9 Population

8.9.1 Baseline

246. The Proposed Project would cross through largely rural areas, away from main settlements and areas of concentrated populations. Settlements along the route are largely dispersed rural communities and the rural catchment of larger towns. The largest settlement located near the Proposed Project is Nenagh, County Tipperary.

247. 'Population' refers to the people who live in, work in, relax in or visit an area. The population assessment considers local and national employment and the economy, community amenity, access to community facilities, tourism and land use, and how these elements affect the populations near the Proposed Project.

8.9.2 Construction

248. The Proposed Project has been designed to reduce the effects on population as far as feasible. This includes routing the Proposed Project away from urban areas and sensitive locations and applying good practice measures for noise and vibration, traffic and transport, air quality and landscape and visual. As a result, during construction, the Proposed Project is not likely to have any negative significant effects on people or communities.

249. It is likely that the Proposed Project would have positive, significant short-term effects on employment levels at both a county and national level due to the creation of new jobs during construction. It is also likely that there would be a positive, significant short-term effect on the national economy as a result of an increase in the contribution from the construction sector from constructing the Proposed Project.

8.9.3 Operation

250. During operation, it is likely that there would be positive, significant long-term effects on the national economy due to the Proposed Project addressing water demand requirements and improving resilience in water supply for the Eastern and Midlands Region. The Proposed Project is not expected to have any negative significant effects on people or communities during operation.

251. The proposed drinking water abstraction is water that would otherwise be used in hydropower generation. As stated in Section 8.4.3, the hydrological and water quality modelling show that the Proposed Project would have no significant effects on the amenity value of Lough Derg, Parteen Basin or the downstream Lower River Shannon. As such, navigation and beneficial uses focused on tourism and recreation would experience the same operating water level range as normal (if these facilities can currently be used throughout the range of water levels, this would remain the case with the Proposed Project in operation).

8.9.4 Mitigation

252. No mitigation requirements have been identified for impacts on population, as any negative effects are deemed to already have sufficient mitigation in place for other environmental topics (such as noise and air quality) to reduce effects on people and communities to a level which is not significant.

8.9.5 Residual Effects

253. The Proposed Project would result in positive, significant short-term residual effects on employment and the national economy during construction. This is due to the creation of new jobs and an increase in contribution to the national economy from the construction sector associated with construction of the Proposed Project. Positive, significant long-term effects are predicted on the national economy during operation due to the Proposed Project addressing demand requirements and resilience in water supply for the Eastern and Midlands Region.

8.10 Human Health

8.10.1 Baseline

254. The Proposed Project is generally confined to agricultural land, therefore there is generally a very limited residential population, largely consisting of dispersed rural communities and the rural catchment of larger towns. There are also educational facilities and healthcare facilities near the Proposed Project which vulnerable groups would use, including Peamount Hospital which shares a boundary with the Termination Point Reservoir. Vulnerable groups within the Proposed Project are schoolchildren, residents and patients at nursing homes/healthcare facilities, isolated older people and the farming community.

255. Across the Proposed Project, air pollutant concentrations are below air quality limits. Noise levels are generally characterised as typical of the environment experienced in rural/semi-rural areas. Lough Derg is protected for bathing water. There are many areas of open space, leisure and play facilities across the length of the Proposed Project, including areas of woodland and the Grand Canal.

8.10.2 Construction

256. Measures have been embedded into the design to avoid impacts on human health, where feasible, including siting Infrastructure Sites and routing the pipeline away from sensitive features and communities. However, during construction, and in the absence of noise mitigation, the Proposed Project would have a negative significant short-term effect on the health of patients, staff and visitors to Peamount Hospital due to construction noise at the Termination Point Reservoir causing impacts on mental wellbeing and sleep disturbance. In addition, there would be a negative significant short-term effect on employment and the economy in the farming sector due to health and wellbeing effects on the farming community. This would be due to impacts on farm businesses, such as temporary and permanent loss of land, and disruption of farm operations during construction.

8.10.3 Operation

257. During operation, the Proposed Project would have positive significant long-term effects on water infrastructure, the economy and resilience to future climate change due to the health benefits that would arise from a resilient water supply provided by the Proposed Project. The Proposed Project is not expected to have any negative significant effects on human health during operation.

8.10.4 Mitigation

258. Key mitigation measures aimed at reducing significant effects on health include adopting measures identified from the noise and vibration assessment, such as use of noise screening (see Section 8.1.4), and agricultural assessment, such as ongoing consultation and liaison with landowners to minimise disruption (see Section 8.6.4).

8.10.5 Residual Effects

259. After the implementation of mitigation measures, there would be no significant residual effects during construction. During operation, there would be a positive significant residual effect associated with health improvements from the Proposed Project resulting in an adequate supply of clean drinking water and wider societal benefits, such as economic and social development and climate change resilience.

8.11 Landscape and Visual

8.11.1 Baseline

260. The landscape in the immediate surrounds of the Proposed Project varies throughout its length. In general, the terrain is flat to mildly undulating. The majority of the Proposed Project passes through networks of agricultural fields and hedgerows. It also crosses substantial areas of peatland, including peatland scrub and peatland fringe forestry as it travels through County Offaly and County Kildare.

261. The Proposed Project avoids centres of population and there are no major public amenities or facilities along the route of the pipeline. The pipeline route intersects with designated walking routes and cycle routes such as the Ormond Way – National Waymarked Way which is near the Break Pressure Tank, and the Grand Canal National Waymarked Way which is near the Termination Point Reservoir. Knockanacree Woods is located adjacent to the Break Pressure Tank and contains scenic lookout points.

262. To support the landscape and visual assessment, field surveys were undertaken where photography of the landscape was taken at various vantage points along the Proposed Project in both summer and winter seasons. These photographs were used to create photomontages to show how the Proposed Project would fit into the landscape. Night-time photomontages were also prepared from a sample subset of selected viewpoints to illustrate and assess visual effects from lighting during the hours of darkness.

8.11.2 Construction

263. The Proposed Project has been designed to reduce the impact on landscape and visual receptors as far as feasible. This includes careful site and route selection and reinstating vegetation along the route of the pipeline. As a result, there is no potential for significant effects on landscape during construction.

264. Construction activities which would give rise to visual impacts include:

- Clearance of vegetation and ground cover
- Movement of works and heavy machinery to and from sites and within working areas
- Stockpiling of excavated material and building material.

265. There would be visual effects from vegetation removal, as this would open up views of the construction works, views of bare earth and partially completed structures as well as views of near-constant relatively high intensity activity often within scenes that are otherwise tranquil or largely static. However, these effects are not likely to be significant due to the location of the works, small number of visual receptors, and retained vegetation and topography of the land which would screen views.

8.11.3 Operation

266. The Proposed Project has been carefully designed to reduce the impact on landscape and visual receptors, including designing the architecture of buildings within the Infrastructure Sites so that they fit within the surrounding landscape, particularly the Raw Water Intake and Pumping Station and Water Treatment Plant which would be within sensitive landscape settings. The pipeline would be buried underground, therefore once operational and the Construction Working Width has been reinstated, there would be little to distinguish the pipeline route from the surrounding landscape. As a result, there is no potential for significant effects on landscape during operation.

267. Visual effects during operation would be from the completed Infrastructure Sites. However, there would be no significant visual effects from operation as the sites have been carefully designed architecturally to reduce the visual impacts. There would also be no significant night-time visual effects from lighting at the Infrastructure Sites.

8.11.4 Mitigation

268. There would be no significant landscape and visual effects from the Proposed Project as the sites have been carefully designed architecturally to reduce visual impacts. Regardless, additional mitigation would be implemented to further reduce the landscape and visual effects. This would take the form of landscape planting at the Infrastructure Sites to act as visual screening and to integrate the sites into the surrounding landscape and replanting of vegetation and hedgerows along the pipeline.

8.11.5 Residual Effects

269. The Proposed Project would result in negative landscape and visual effects; however, they would not be significant due the embedded design measures, such as site selection and architectural design. The mitigation measures would further reduce visual effects and would help the Proposed Project integrate into the wider landscape. There would therefore be no likely significant residual landscape and visual effects from the Proposed Project during construction or operation.

8.12 Cultural Heritage

8.12.1 Baseline

270. There are multiple recorded archaeological and architectural heritage sites along the length of the Proposed Project. This includes recorded monuments, areas of archaeological potential, protected heritage structures, demesne landscapes and previously unrecorded structures of built heritage importance.

271. Field inspections, archaeological geophysical surveys and monitoring of site investigations have been carried out to support the assessment.

8.12.2 Construction

272. Extensive work has been completed to identify and avoid cultural heritage constraints at the location of the Infrastructure Sites and along the route of the pipeline. As a result of these embedded design measures, direct impacts have been avoided for the majority of recorded monuments located within the Construction Working Width. Despite these embedded measures, in the absence of mitigation, there would be potential significant effects on four recorded monument sites due to the removal or partial removal of these known and recorded archaeological sites. The four recorded monument sites include:

- An unclassified togher, located within the townland of Ballykilleen, County Offaly. A togher is a type of archaeological feature that refers to an ancient road or causeway
- An enclosure, located within the townland of Cooltrim South, County Kildare. An enclosure is any area of land separated from surrounding land by earthworks, walls or fencing
- An enclosure, located within the townland of Barberstown Upper, County Kildare
- An enclosure, located within the townland of Knockanacree, County Tipperary.

273. In addition to the recorded monuments, there are numerous areas of archaeological potential which would also be subject to significant negative effects due to their removal or partial removal as part of the Proposed Project (examples include watercourses, possible enclosures, field systems, and sites of potential settlements). Mitigation will be implemented to reduce these effects (see Section 8.12.4).

274. Within defined areas of archaeological potential, boglands and undisturbed areas, where archaeological potential has been identified, although no specific archaeological features are recorded, the potential for impacts on previously unrecorded archaeological features has been assessed. The significance of effect in this instance would be dependent on the nature, extent and importance of any archaeological remains that are present.

8.12.3 Operation

275. No likely significant effects are predicted upon cultural heritage during operation, as there would be no excavation, the pipeline would be buried underground, and the Infrastructure Sites would be minimally visually intrusive and would therefore not significantly impact the setting of any heritage sites.

8.12.4 Mitigation

276. Key mitigation measures for cultural heritage aimed at reducing significant effects include, but are not limited to:

- Preservation *in situ* of recorded monument sites and areas of archaeological potential by fencing them off from construction activities
- Archaeological assessments and archaeological testing to be carried out prior to construction
- Archaeological monitoring during construction
- Written and photographic recording to be carried out at certain sites prior to construction
- Detailed bogland inspections prior to construction
- A Project Archaeologist will be appointed for the Proposed Project to ensure that all mitigation measures are carried out to the full and to ensure the effectiveness of the measures.

8.12.5 Residual Effects

277. No likely significant residual effects are predicted on archaeological, architectural or cultural heritage receptors during construction and operation of the Proposed Project with the implementation of mitigation.

8.13 Material Assets

8.13.1 Baseline

278. Material assets are resources of both natural and human origin that have intrinsic value, including built services and infrastructure. For the purpose of the EIAR, material assets have been defined as utilities infrastructure (gas and electricity transmission, communications infrastructure, surface and foul drainage), transport infrastructure (roads, railways, and canals), and industrial land use (such as wind farms and power generation facilities), and the Proposed Project would cross a number of these assets. Other features which may also be considered to be material asset types have been addressed in their own respective chapters, for example agricultural land has been assessed within the agriculture assessment, and watercourses have been assessed in the water assessment.

8.13.2 Construction

279. Measures have been embedded into the design to reduce the impact on material assets. This includes, for example, the avoidance of material assets through the careful routing or siting of the pipeline and permanent Infrastructure Sites, which has avoided any significant effects on industrial land use.

280. Trenchless crossing techniques will be used to take the pipeline beneath existing assets such as the Grand Canal, railway crossings, major road crossings and power line crossings, avoiding significant effects on these assets. Where regional and local roads would be crossed by an open excavation, these would be undertaken under a short closure (for example over the weekend) with suitable traffic management put in place. This would not result in significant effects, as the disruption would only be temporary.

281. Although care has been taken to align the pipeline route and locate Infrastructure Sites away from utility assets, there are potential effects arising where the Proposed Project unavoidably intersects existing utilities. However, during construction of the Proposed Project no existing utility infrastructure would be subject to major disruption in such a way as to interrupt end users of the material assets, for example gas mains or electricity distribution network. The construction works would be planned in such a way as to ensure that even if a material asset outage was temporarily required, alternative provisions will be made to enable continuity of supply. There would therefore be no significant effect on existing utilities.

8.13.3 Operation

282. During operation of the Proposed Project, there would be no proposed activities that would negatively impact electricity or gas transmission infrastructure, telecommunications infrastructure, transport infrastructure, or industrial land use. The design of the pipeline includes Washout Valves to allow the pipeline to be drained infrequently during operation, typically once every 20 to 30 years. These are planned events and would be scheduled to suit landowner constraints and weather conditions such that the discharge of water would not impact land or drainage assets. Therefore, there would be no significant effect on material assets during operation.

8.13.4 Mitigation

283. There would be no likely significant effects on material assets, therefore there are no specific mitigation measures required over and above the embedded mitigation and good practice measures previously described to avoid or reduce effects. Good practice measures included in the Construction Environmental Management Plan will be followed in regard to utility and transport infrastructure. In addition, Uisce Éireann will also appoint Landowner Liaison Officers to manage communication with the relevant landowners to facilitate the implementation of the good practice mitigation and monitoring works on their land.

8.13.5 Residual Effects

284. The material assets which have been identified are key types of infrastructure, and from the outset embedded mitigation measures have been used to avoid end user disruption to utility assets and to achieve reasonable minimum levels of disruption to users of transport infrastructure. Any negative effects would be temporary and reversible. In summary, therefore, there would be no residual significant effects in relation to material assets.

8.14 Resource and Waste Management

8.14.1 Baseline

285. The construction of the Proposed Project would require a variety of construction materials, with the most substantial (by volume) expected to be aggregates, concrete and steel. Operational material consumption would consist of any materials required for the ongoing operation and maintenance of the Proposed Project.

286. Construction waste would be managed using the waste hierarchy (Image 8.2), prioritising prevention, minimisation, reuse, recycling and recovery measures. Any residual construction and demolition waste and excavated wastes would require disposal within landfill. Operational waste from the Proposed Project would consist of water treatment residuals from the Water Treatment Plant – the main component being residual water treatment sludge.

287. The baseline for this assessment against which the analysis was undertaken relates to the following:

- The availability of materials required for the construction of the Proposed Project
- The availability of waste management facilities to receive materials and waste generated by the Proposed Project.

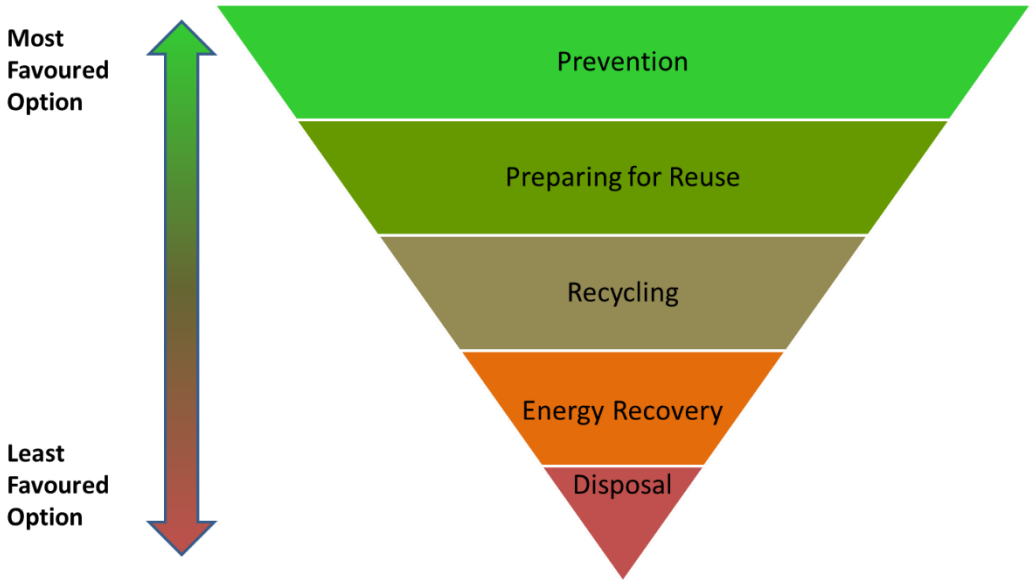

Image 8.2: The Waste Hierarchy

8.14.2 Construction

288. The Proposed Project has been designed to reduce impacts in relation to resource and waste management where feasible. These embedded measures include reducing the volumes of excavated waste, maximising the reuse of materials within the Proposed Project, choosing a design which minimises volume of waste generated and managing waste in accordance with the Waste Framework Directive. However, despite these measures, during construction of the Proposed Project, there would be a reduction in landfill space due to the disposal of approximately 1,860,000 tonnes of inert and non-hazardous waste and a reduction in hazardous waste landfill space due to the disposal of approximately 740 tonnes of hazardous waste, over the five-year period of construction. This is assessed as a significant effect in the absence of mitigation measures.

8.14.3 Operation

289. During operation of the Proposed Project, the amount of waste generated would be less than during construction. The main waste would be residual water treatment sludge generated at the Water Treatment Plant. This waste will be recovered or reused. It will not be spread on land. Any hazardous waste produced during operation will be recycled or treated and recycled where feasible. There would therefore be no likely significant effects during operation.

8.14.4 Mitigation

290. Key mitigation measures for resource and waste management aimed at reducing significant effects are included in a Construction and By-Product Management Plan and include, but are not limited to:

- Reuse of materials where feasible on site
- Use of recycled materials where feasible
- Waste to be stored away from sensitive receptors and segregated on site where feasible
- Ordering of materials to be managed in line with construction requirements and schedules
- Applying circular economy and waste hierarchy principles to divert waste from landfills.

291. In the line with the above measures, the Proposed Project has a target that zero tonnes of recoverable waste would be disposed of to landfill.

8.14.5 Residual Effects

292. The proposed mitigation measures would reduce the materials to be consumed, and the waste to be disposed of in landfill, in line with relevant legislation and national targets. This will include the reuse of material to avoid it becoming a waste. Therefore, after the implementation of mitigation measures, the Proposed Project would result in no likely significant residual effects.

8.15 Risk of Major Accidents and Disasters

8.15.1 Baseline

293. A major accident is an event (for instance, train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e. contractors) to manage. Major accidents can be caused by disasters resulting from both man-made and natural hazards.

294. A disaster is a man-made/external hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation that meets the definition of a major accident.

295. The assessment of major accidents and disasters considers the occurrence of extreme and highly unlikely incidents. As such, while the assessment draws on baseline information relevant to other environmental topic chapters in the EIAR, it considers scenarios that would not reasonably be covered by the other environmental topic assessments. The assessment focuses on the risk of extreme incidents and the potential for significant environmental effects as a result of those extreme incidents.

8.15.2 Construction and Operation

296. A risk register has been used to evaluate the potential risks which could occur during construction and operation of the Proposed Project.

297. Measures have been embedded into the design to reduce the risk of major accidents and disasters (for example, placing the pipeline at a suitable depth to avoid collapse of existing infrastructure and using suitable working methods for working in peat). As such, the majority of potential risks are assessed as ‘low’ risk events due to the low likelihood of an event occurring or limited consequence of impact if an event did occur. There are four risks which have been assessed as having a ‘medium’ risk in the absence of mitigation measures (all during the construction):

- Pollution event leading to environmental damage, for example associated with the potential release of silt to a watercourse or spillage associated with fuel storage, use and handling during construction

- Risk of mobilisation of silt during construction of the Raw Water Intake in Parteen Basin during construction
- Risk of failure of the silt curtain in Parteen Basin during construction
- Flooding of trench excavations for the pipeline during construction due to severe rain, surface runoff or groundwater.

8.15.3 Mitigation

298. For the four medium risks set out above, key mitigation measures to reduce significant effects include, but are not limited to:

- Good practice measures included in the Construction Environmental Management Plan and Surface Water Management Plan will be followed to prevent pollution and flooding, for example use of attenuation ponds
- A double silt curtain will be used at Parteen Basin and supplemented with monitoring, including regular removal of silt to avoid the build-up of material.

8.15.4 Residual Effects

299. Following the implementation of mitigation measures, the potential risks associated with major accidents and disasters would reduce to a level below the threshold of significance ('low' risk event). Therefore, the Proposed Project is unlikely to result in a significant effect during construction or operation, both in terms of its vulnerability to a major accident or disaster and also when considering its potential to cause a major accident or disaster.

8.16 Cumulative Effects and Environmental Interactions

300. A cumulative effects assessment has been carried out for the Proposed Project. This considers and assesses the potential for cumulative effects arising from the Proposed Project in association with other projects and plans during construction and operation. For example, multiple developments planned in close proximity to the Proposed Project could lead to combined effects on the setting of a cultural heritage landscape, compared to if the developments were considered in isolation.

301. There were 164 other projects and plans identified which could interact with the Proposed Project to increase effects on the environment and were therefore further reviewed and assessed to identify any potential for likely significant cumulative effects with the Proposed Project.

302. The cumulative assessment identified that there would be significant residual cumulative effects with six other projects or plans (including a residential development, two EirGrid developments, a windfarm development, Cycle Connects, and an energy transmission upgrade project) from permanent habitat loss, and effects on bats and badgers. This is because the Proposed Project, as well as these other plans and projects, would have significant effects on these receptors, and are close enough that the effects could impact the same receptors if the construction periods overlap. Measures to mitigate the effects on biodiversity from the Proposed Project are also relevant to these cumulative effects, including, for example, reinstatement of habitat, landscape planting at the infrastructure sites, and provision of bat boxes and artificial badger setts. These cumulative effects would occur during construction. There would be no significant cumulative effects during operation with any other project or plan.

8.17 Summary of Likely Significant Effects

303. Table 8.1 provides a summary of the likely significant residual environmental effects from constructing and operating the Proposed Project. Mitigation measures have been developed to avoid or reduce environmental effects where feasible. These measures have been considered when determining the significance of effects.

Table 8.1: Summary of Likely Significant Residual Effects

Topic	Summary of Likely Significant Residual Environmental Effects	
	Construction	**Operation**
Noise and Vibration	Likely significant residual noise effects at three Pipe Storage Depots within 30m of noise sensitive locations and 12 trenchless crossings with night-time works within 190m of noise sensitive locations. Likely significant residual vibration effects from disturbance on three sensitive locations.	No residual significant effects identified.
Traffic and Transport	Temporary significant residual effects at three junctions during construction due to an increase in queue lengths and delays, and three Haul Roads due to an increase in vehicles using the roads, during peak construction periods.	No residual significant effects identified.
Biodiversity	Likely significant residual effect on terrestrial habitats during construction due to the permanent loss of habitat from the Infrastructure Sites, access roads, and other permanent infrastructure such as valves. Short-term likely significant residual effects on bats at a local level during construction due to loss of five roosts and construction activities resulting in loss and fragmentation of habitat. Short-term likely significant negative residual effects on badger at a local level during construction due to the loss of 33 setts.	No residual significant effects identified.
Water	No residual significant effects identified.	No residual significant effects identified.
Soils, Geology and Hydrogeology	Likely short-term residual significant effects on small areas of degraded raised bog due to soil compaction and loss of peat. These effects would not be significant in the long-term.	No residual significant effects identified.
Agriculture	Residual significant effects on individual land parcels, including equine only enterprises, from the pipeline infrastructure and Infrastructure Sites, due to loss of land and disruption to farming operations.	Residual significant effect on one equine only enterprise due to the potential locations of above-ground infrastructure.
Air Quality	No residual significant effects identified.	No residual significant effects identified.
Climate	No residual significant effects identified.	No residual significant effects identified.
Population	Positive significant effects on employment and the national economy.	Positive significant effects on the national economy.
Human Health	No residual significant effects identified.	Positive significant effects on health improvements from a new water supply.
Landscape and Visual	No residual significant effects identified.	No residual significant effects identified.
Cultural Heritage	No residual significant effects identified.	No residual significant effects identified.
Material Assets	No residual significant effects identified.	No residual significant effects identified.
Resource and Waste Management	No residual significant effects identified.	No residual significant effects identified.
Risk of Major Accidents and Disasters	No residual significant effects identified.	No residual significant effects identified.
Cumulative Effects and Interactions	Significant cumulative effects with six other developments on permanent habitat loss, and effects on bats and badgers, if construction periods overlap.	No residual significant effects identified.

9. Next Steps

304. The EIAR forms part of the planning application to An Coimisiún Pleanála. If planning permission is granted, the construction process would begin which is anticipated to take five years, commencing in 2028 with the majority of construction works complete by 2032.

305. In addition to the planning application for the Proposed Project, an application for an abstraction licence for the Proposed Project is required under the Water Environment (Abstractions and Associated Impoundments) Act 2022. This application will be made to the Environmental Protection Agency as the competent authority for abstraction licensing.