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Appendix 1.2 Gas Networks Ireland Infrastructure Upgrade Outline Report							

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Herbata Data Centre

Naas, Co. Kildare

Gas Networks Ireland Infrastructure Upgrade Outline Report

(Planning Submission)

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1 Introduction

Donnachadh O'Brien & Associates Consulting Engineers Ltd. (DOBA) have been instructed by Herbata Limited to prepare a report in relation to the future Gas Networks Ireland (GNI) infrastructure upgrade works required to construct a new high-pressure gas distribution pipeline from the existing GNI Above Ground Installation (AGI) at Glebe West, Co. Kildare to the proposed Herbata Data Centre development at Halverstown, Naas, Co. Kildare, circa 9.5km northwest.

The Project will use highly efficient on-site gas turbines to generate the majority of electrical energy required to operate the Data Centres. Whilst the Project includes an on-site AGI to regulate the supply to the turbines, a physical connection to the GNI gas network is required to provide the supply to the gas turbines.

A high-pressure gas pipe is expected to be made available by GNI at the proposed Data Centre site boundary on the R409. This will then feed into an AGI gas infrastructure compound, to be constructed as part of the Data Centre development, to reduce the pressure to 24 Bar. This supply is required to feed the on-site power generation solution for the Data Centres.

The final, detailed design, consenting and construction of the required infrastructure works will be the responsibility of GNI in the exercise of their own statutory functions, and therefore Herbata Ltd is not seeking planning consent to carry out these works as part of the Project.

Notwithstanding the fact that Herbata Ltd is not seeking planning consent to carry out these works as part of the Project, given the functional interdependence that exists between the Project and the GNI Gas Connection, the cumulative impacts of the Project with the GNI Gas Connection have been considered and assessed in the EIAR, and their in-combination effects have been considered and assessed in the related Appropriate Assessment Screening Report.

This Report has been prepared in order to inform this consideration and assessment of the cumulative impacts of the Project with the GNI Gas Connection, and provides sufficient detail and information to allow a robust cumulative impacts assessment to be conducted.

While, as noted above, the final design of the upgrade works is subject to GNI design specifications and the works will be undertaken by GNI, this report identifies the most likely route for the new high-pressure gas distribution pipeline and describes the works that are required to provide same.

The GNI Infrastructure Upgrade Outline Report has been prepared following a review of the existing GNI network, to determine the most likely source of the connection and the most likely route. The likely specification



of the new high-pressure gas distribution pipeline, pressure levels, construction methodology and timelines, as set out with the GNI Infrastructure Upgrade Outline Report have been informed by experience and knowledge of comparable infrastructure developments. The location of the existing GNI above ground installations (AGIs) at Glebe West and Naas Town and the associated existing high-pressure transmission line between, has been used to inform the most likely connection point and route for the new high-pressure gas distribution pipeline based on expert knowledge of the existing road and service infrastructure networks in the Naas area and with reference to the GNI publications "Guidelines for Designers and Builders - Industrial and Commercial (non-Domestic) Sites" and "Safety Advice for working in the vicinity of Gas pipes 2021".

This report comprises a review of the required works under the following headings:

- Most Likely Route
- Description of the Works



2 Most Likely Route

2.1 Existing GNI Infrastructure

From a review of the available GNI infrastructure maps we note that there is an existing 150mm dia. 70 Bar transmission pipe running from the AGI at Glebe West to the Naas Town AGI on the Ballymore Eustace Road.

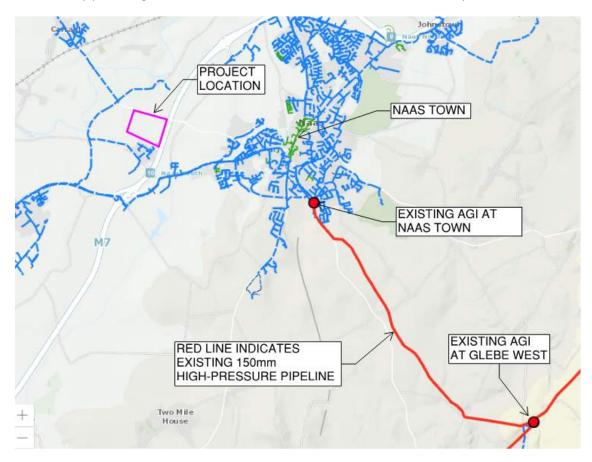


Figure 2-1 - Extract from GNI mapping indicating high pressure transmission pipe route from Glebe West AGI to Naas Town AGI



This transmission pipe runs primarily across agricultural land before crossing the public park at Oak Park and terminating at the Naas Town AGI.



Figure 2-2 - Extract from GNI mapping indicating high pressure transmission pipe at Glebe West AGI

Following termination of the high-pressure pipe at Naas Town AGI there is no further high-pressure transmission line serving the greater Naas area. The available GNI mapping of the existing high-pressure transmission pipe



route and the remaining low-pressure network between Naas Town AGI and the proposed Herbata Data Centre Site are included in Appendix A of this report.

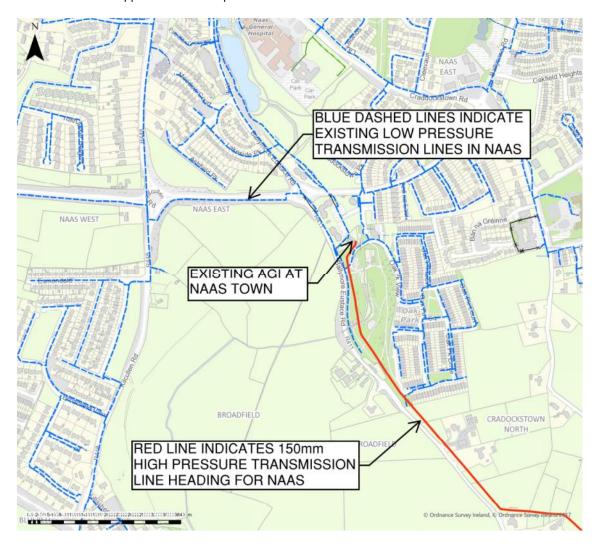


Figure 2-3 - Extract from GNI mapping indicating high pressure transmission pipe at Naas Town AGI



2.2 Most Likely Route for New Network Upgrade

The proposed upgrade works will include the construction of a new circa 300mm dia. high pressure gas pipeline in addition to the existing 150mm dia. pipe indicated on the GNI mapping. Based on a review of the existing GNI network it is considered that the most likely route for the upgraded transmission pipe is to follow the existing pipeline route from the Glebe West AGI to the Naas Town AGI. While alternatives to the most likely route were considered, they were considered not feasible/likely as GNI hold a wayleave agreement over the existing high-pressure route from Glebe West to Naas Town AGI and the existing route represents the most direct route, from the nearest available AGI on a high pressure pipeline in 27km of the site.

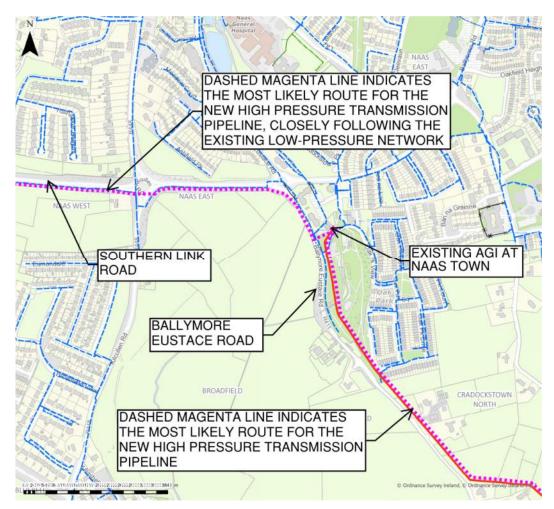


Figure 2-4 - Extract from GNI network map with most likely route for upgraded high-pressure transmission pipeline indicated from Naas Town AGI



It is considered that the new pipe will be constructed immediately adjacent to the existing pipeline, allowing for minimum separation requirements. The route from Glebe West AGI to Naas Town AGI is circa 6.5 km mostly across agricultural lands.

Subsequent to reaching the Naas Town AGI it is considered that the most likely route for the new pipeline will be to closely follow the existing low-pressure distribution network around the Southern Link Road to the junction with the R445 Newbridge Road, after which it will likely cross the canal to follow the existing public foul sewer network (for which there is a wayleave in place) which crosses agricultural lands, heading northwest.

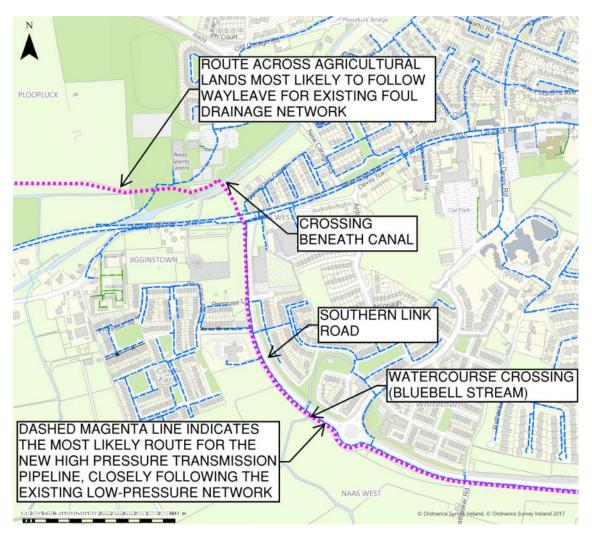


Figure 2-5 - Extract from GNI network map with most likely route for upgraded high-pressure transmission pipeline indicated from Newbridge Road



The pipeline will then most likely cross under the M7 motorway, most likely by horizontal directional drilling to reach the west side of the M7, emerging onto the R409 Caragh Road, whereupon it will enter the proposed Herbata Data Centre development site. The pipe route from Naas Town AGI to the project site is circa 4km (2km along the public road from Naas Town AGI to the Newbridge Road, 1.55km across agricultural lands from the Newbridge Road to the M7 motorway. From this point, the most likely route is considered to cross the M7 (east of the Project site) before following the route of the R409 to the Project site (circa 0.5km). It is understood that similar crossings, below the M7 have previously been implemented in order to deliver comparable service infrastructure.

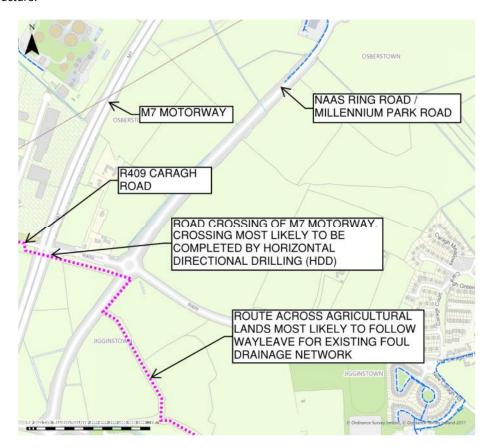


Figure 2-6 - Extract from GNI network map with most likely route for upgraded high-pressure transmission pipeline indicated to Caragh Road

The full mark-up of the most likely route is included in Appendix B of this report. As noted above the route indicated is based on consideration of the most likely route from available public services mapping information, existing GNI infrastructure locations and our understanding of the roads and infrastructure in the surrounding Naas area.



3 Description of the Works

This section describes the works that will be required to provide the new high-pressure gas distribution pipeline, based on the most likely route for the pipeline as identified in Section 2 above.

3.1 Crossing Agricultural/Open Land

A large portion of the works will consist of crossing agricultural / open lands. A construction corridor for the works will be required in order to complete the construction and installation of the pipeline. This usually consists of a 14m wide strip, centred on the pipeline. This 14m wide strip will become a permanent wayleave across the lands in question following completion of the works to allow future access to the infrastructure by GNI.

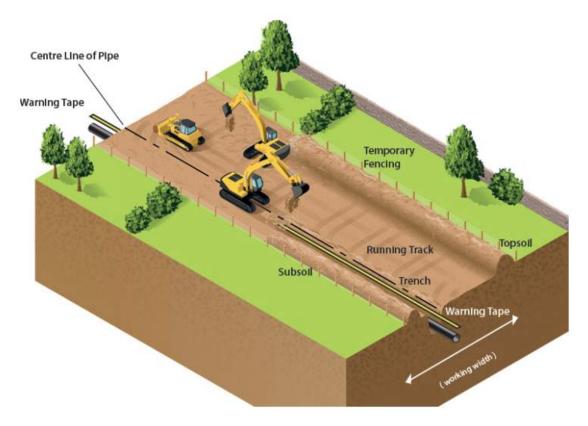


Figure 3-1 - Typical pipeline installation working arrangement across agricultural lands



Access to the works on agricultural lands will typically be provided at public road crossing locations. Special considerations for construction traffic management, adequate site signage and risk assessments will be required for the route through agricultural lands and particularly at interfaces/accesses with public roads. Temporary roads may need to be constructed from existing access points to the location of the works in remote locations.

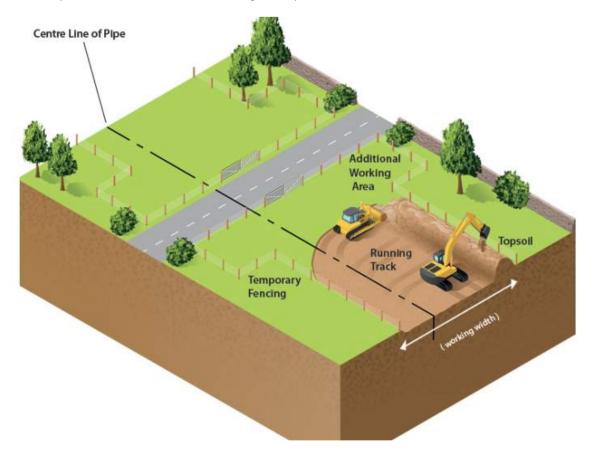


Figure 3-2 - Typical pipeline installation access arrangement to working area

3.2 Works Along Public Roads

Works along the public road will likely involve the installation of the new pipeline along the verge of the Southern link road, where the existing low-pressure transmission pipes are also located. There will also be a requirement for crossings at several public roads along the route of the pipe. Consultations with Kildare Co. Council Roads Department will be required as well as the preparation of temporary traffic management plans, road opening licences, construction traffic management plans and all associated safety and signage requirements in order to complete the works.



3.3 Typical Pipeline Installation Detail

The installation of the pipeline requires excavation of a trench through the agricultural land / roadway. Typically, the depth of burial will be 1.2m of cover to the pipe, with 2 layers of marker tape to be laid in the trench. Final details of the trench installation will be subject to GNI design. The new pipeline will likely be installed at a pressure of 19 bar. All excavations shall be carried out in accordance with the guidance set out in the HSA Code of Practice for Avoiding Danger from Underground Services.

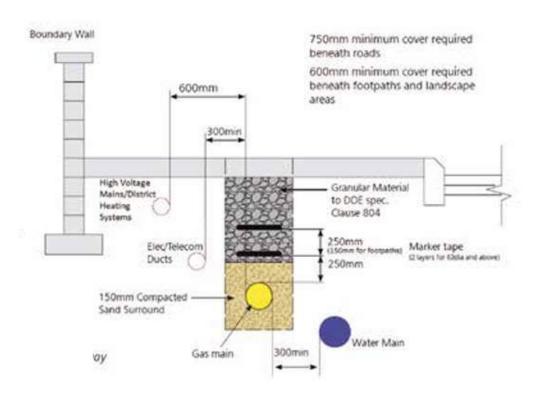


Figure 6: Recommended gas main layout in a footpath/roadway

Figure 3-3 - Extract from GNI Guidelines for Designers and Builders - Industrial and Commercial (non-Domestic) Sites



3.4 Watercourse Crossings

The most likely route of the new pipeline will require crossing a number of watercourses, including the Grand Canal, Naas Rive, Bluebell Stream and numerous land drainage ditches. The method of constructing these crossings will be subject to detailed design by GNI and will typically consist of either open excavation (from smaller watercourses and ditches) or directional drilling / pipe jacking as appropriate. GNI will determine the best crossing method for all watercourses as part of their Environmental Assessment. The final design will be subject to consultations with Waterways Ireland / Inland Fisheries Ireland and Kildare Co. Council Water Services and Environment departments. The key watercourse crossings have been identified on the proposed route drawings in Appendix B of this report.

Description of Typical Horizontal Directional Drilling Process:

The drilling contractor prepares a site area up to 40m2, accommodated within the greed site area. If areas are overgrown with thick vegetation, it would be removed sympathetically and disposed of via a licensed waste contractor. The area is then levelled where required by using the front bucket of an 180° excavator; however, there is no requirement for the working area to be stripped of topsoil. Instead, it may be overlain with a suitable geotextile material and 200mm of appropriate stone. The boundaries of the rig up area and exit area would both be defined with security fencing positioned to ensure adequate access is maintained.

The drilling rig and fluid handling units may be placed on bunded 0.5mm PVC to contain any fluid spills and storm water run-off. Entry and exit pits (1m x 1m x 2m) are excavated using a 180° excavator and the resultant spoil bunded in 0.5mm PVC liner within the designated working areas. A 1m x 1m x 2m steel box is placed in the ground to control drilling fluid returns from the borehole. Drilling fluid is pumped down the drill string and through the down hole motor, which converts the fluids hydraulic power to mechanical power and rotates the drill bit. The drill bit is oriented by the surveyor, and the driller pushes the drill string into the ground maintaining the bore path. The drilled cuttings are flushed back by the drill fluid flowing via nozzles in the bit, up the annulus to surface, where they are separated from the fluid fraction for disposal. A comprehensive closed-loop drilling fluid mixing and circulation system with recycling capability is utilised to minimise the volume of fluids required on site. Constant monitoring of fluid volume, pressure, pH, weight and viscosity is undertaken. Constant attention is given to number of cuttings produced so that no over cutting takes place and that hole cleaning is maintained. The mud returns are pumped to the circulation system trailer by means of a bunded centrifugal pump.

A steering system, guided by tri-axial magnetometers and accelerometers that provide real time directional information to the surveyor at the driller's console, is used to navigate the bores. Once the first pilot hole has



been completed a hole-opener or back reamer is fitted at the exit side and pulled back through the bore to the entry side. A drill pipe is added at the exit side to ensure that a mechanical presence is always present within the bore.

On completion of the hole-opening phase a towing assembly consisting of tow heads, a swivel and a reamer will be used to pull the ducts into the bore. Close attention is paid to modelled drag forces during pullback with constant monitoring of load stress undertaken to ensure that modelled tensile stress, collapse pressures, hoop stress and buckling stress are not exceeded.

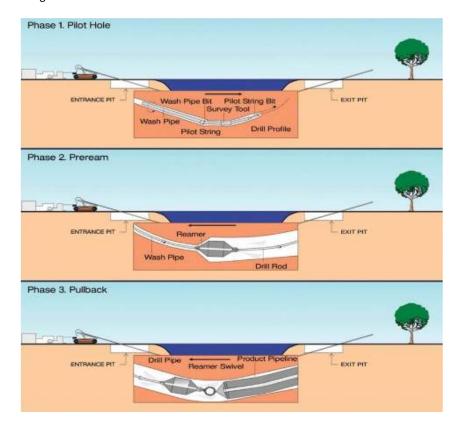


Figure 3-4 - Horizontal Directional Drilling Process

On completion of the works, the stone and geo-membrane are carefully removed using a backhoe or 360° excavator and transported to a licensed disposal unit. The site area is reinstated as per the landowner and statutory requirements. The ducts are tested and proved and the duct bundles are also gyro-surveyed to provide an accurate as constructed record.

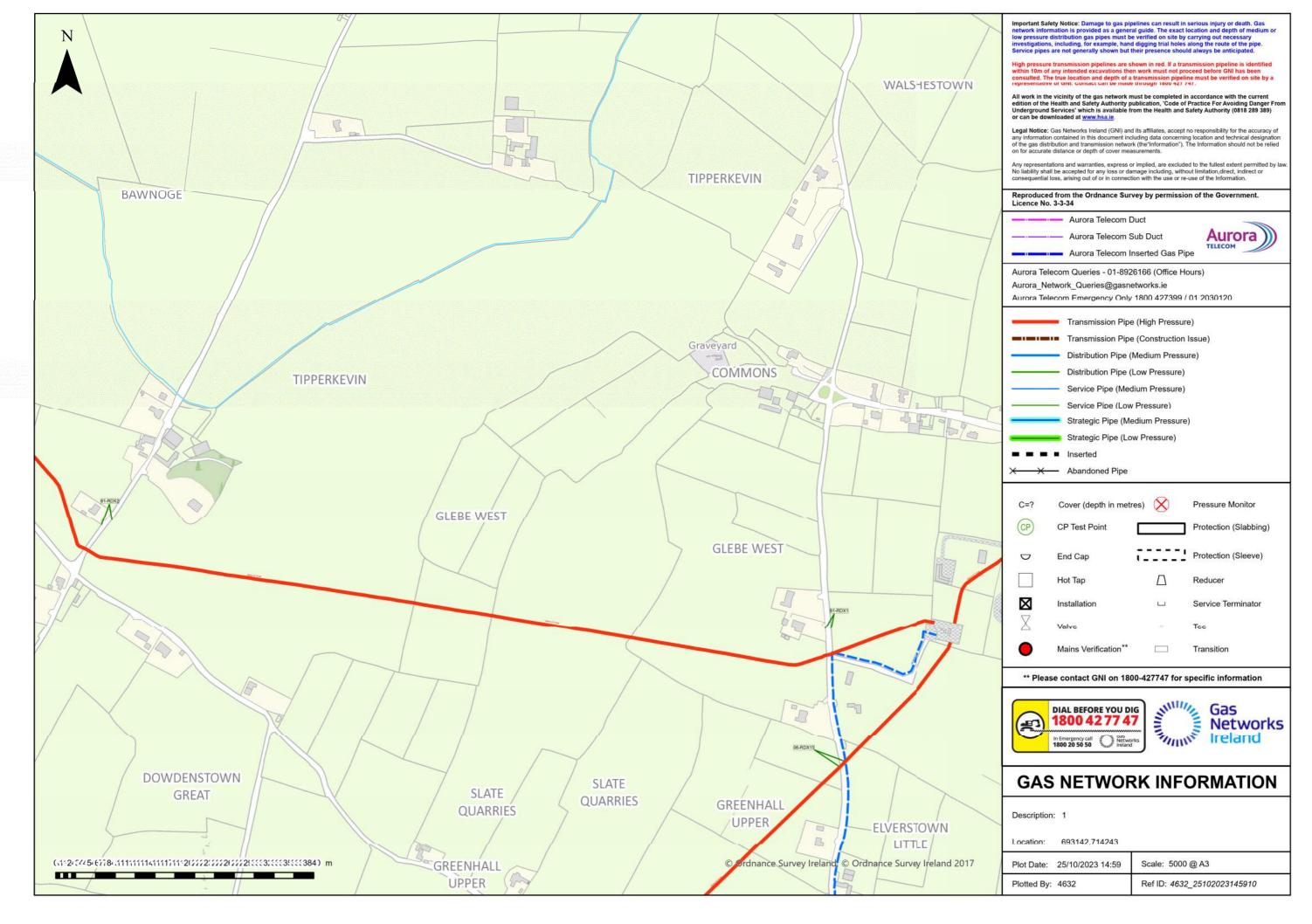


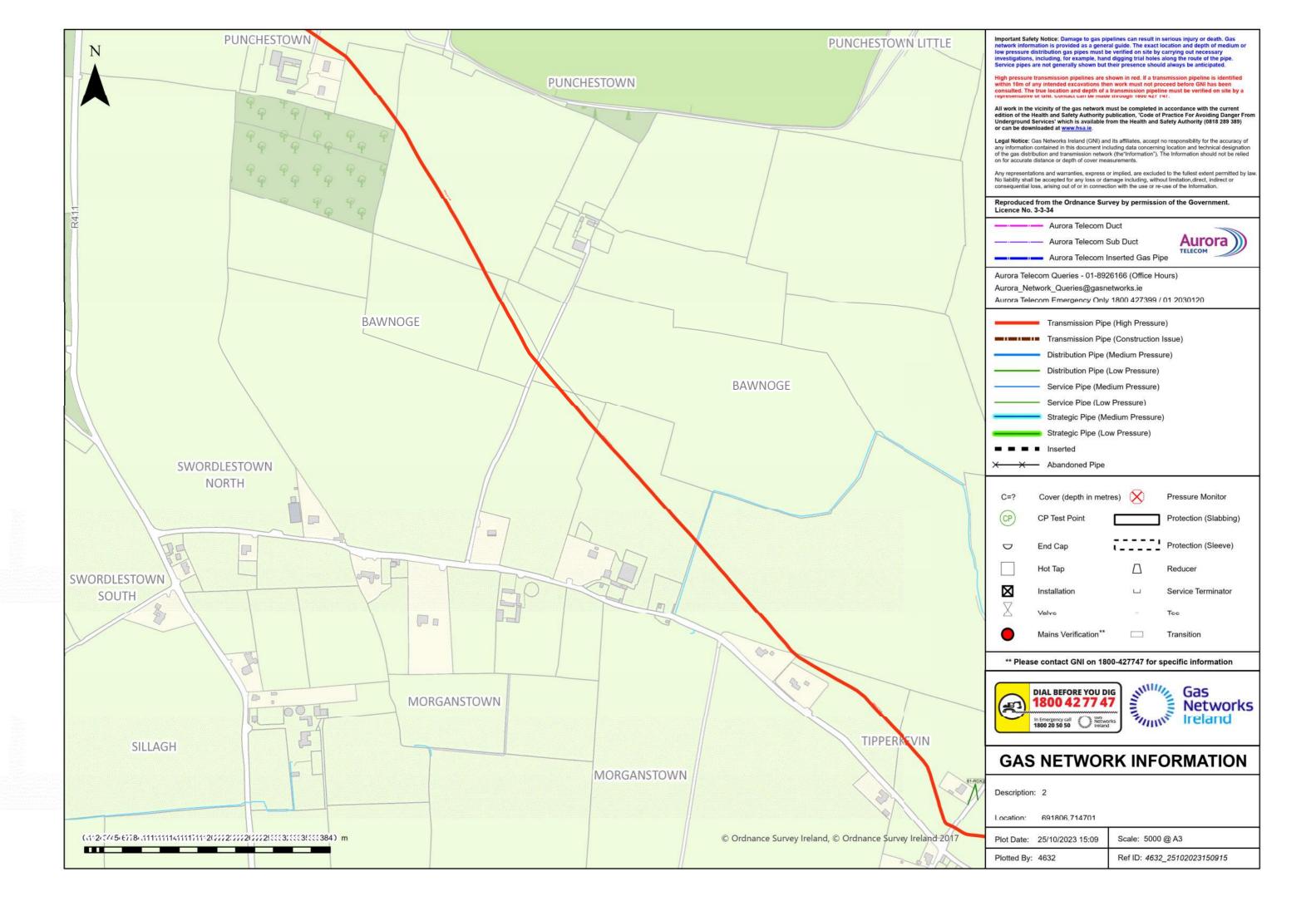
3.5 Timeline for Construction

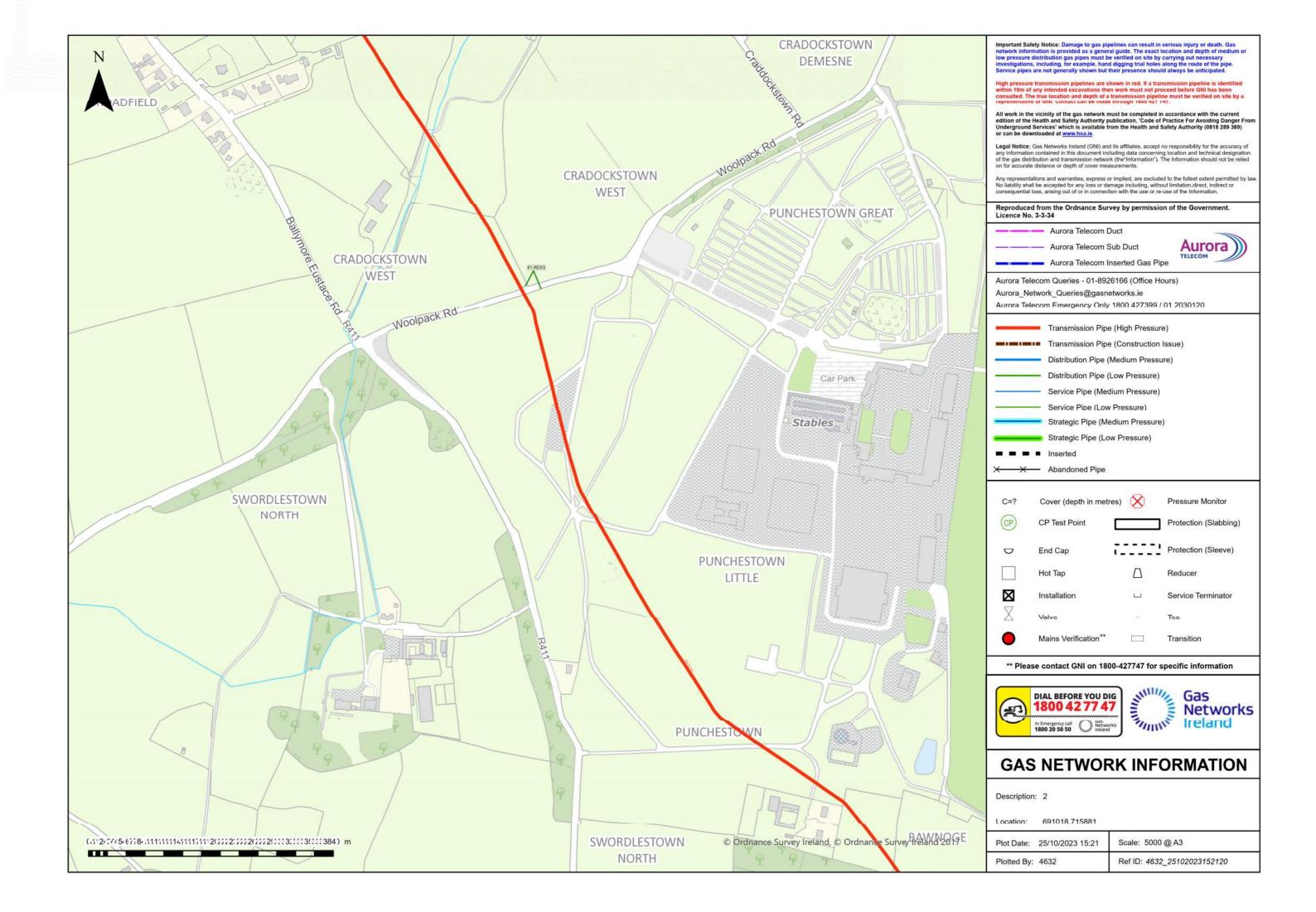
The nature and extent of the required works dictate an approximate construction programme of 7-12 months, subject to final design and route. The construction of the AGI within the Herbata Data Centre project planning application and boundary will take approx. 7-8 months.

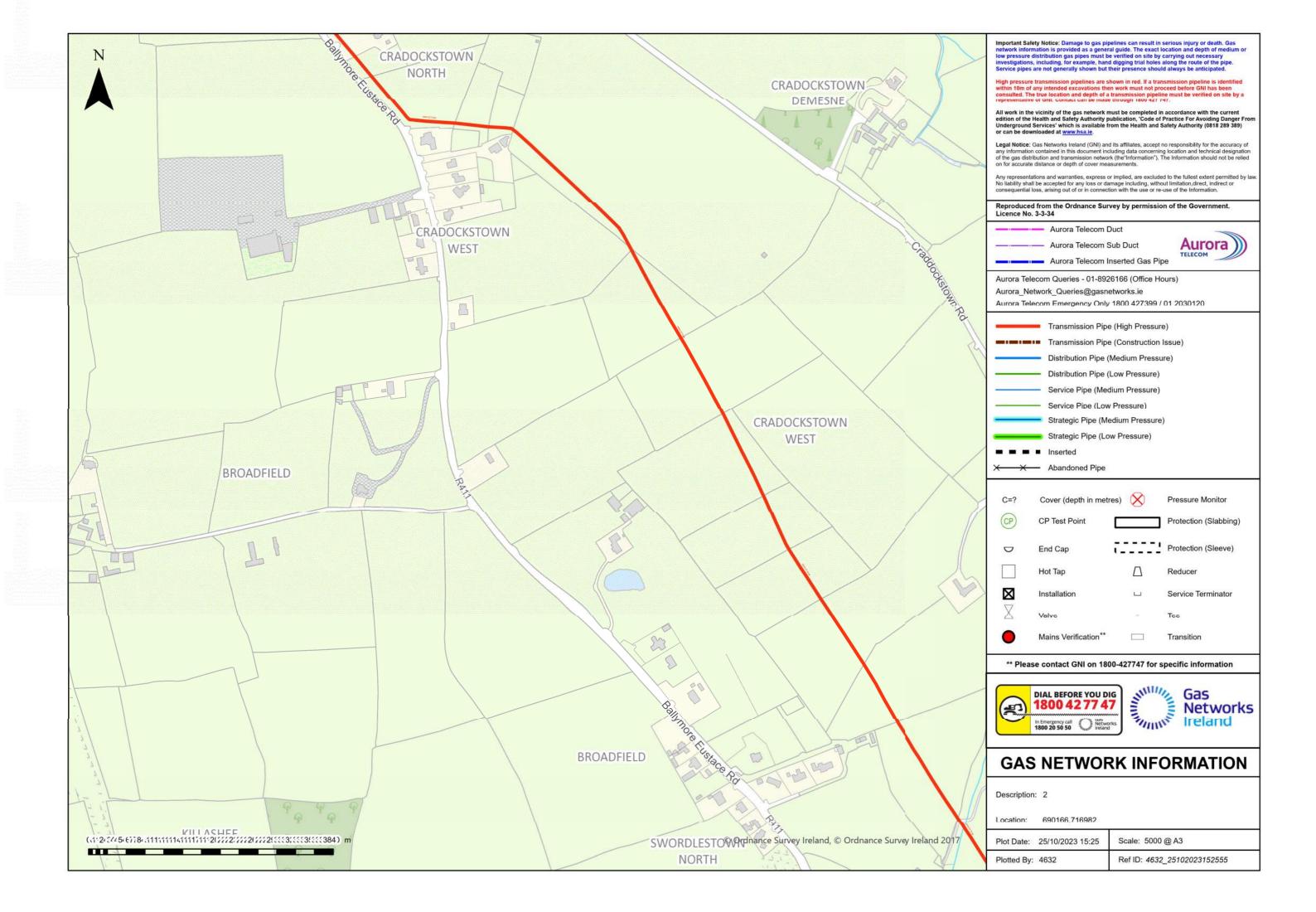


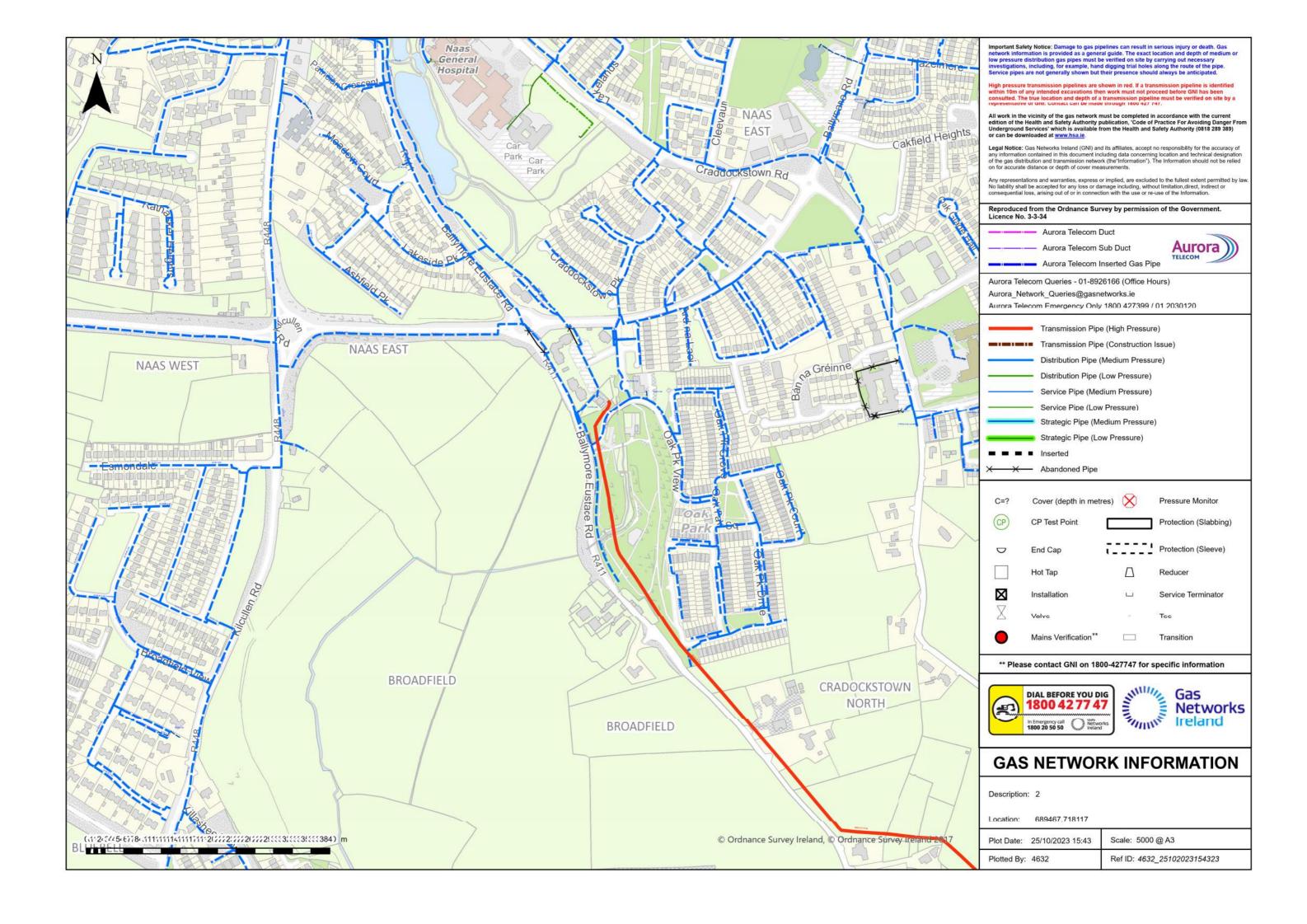
Appendix A – GNI Existing Infrastructure Maps

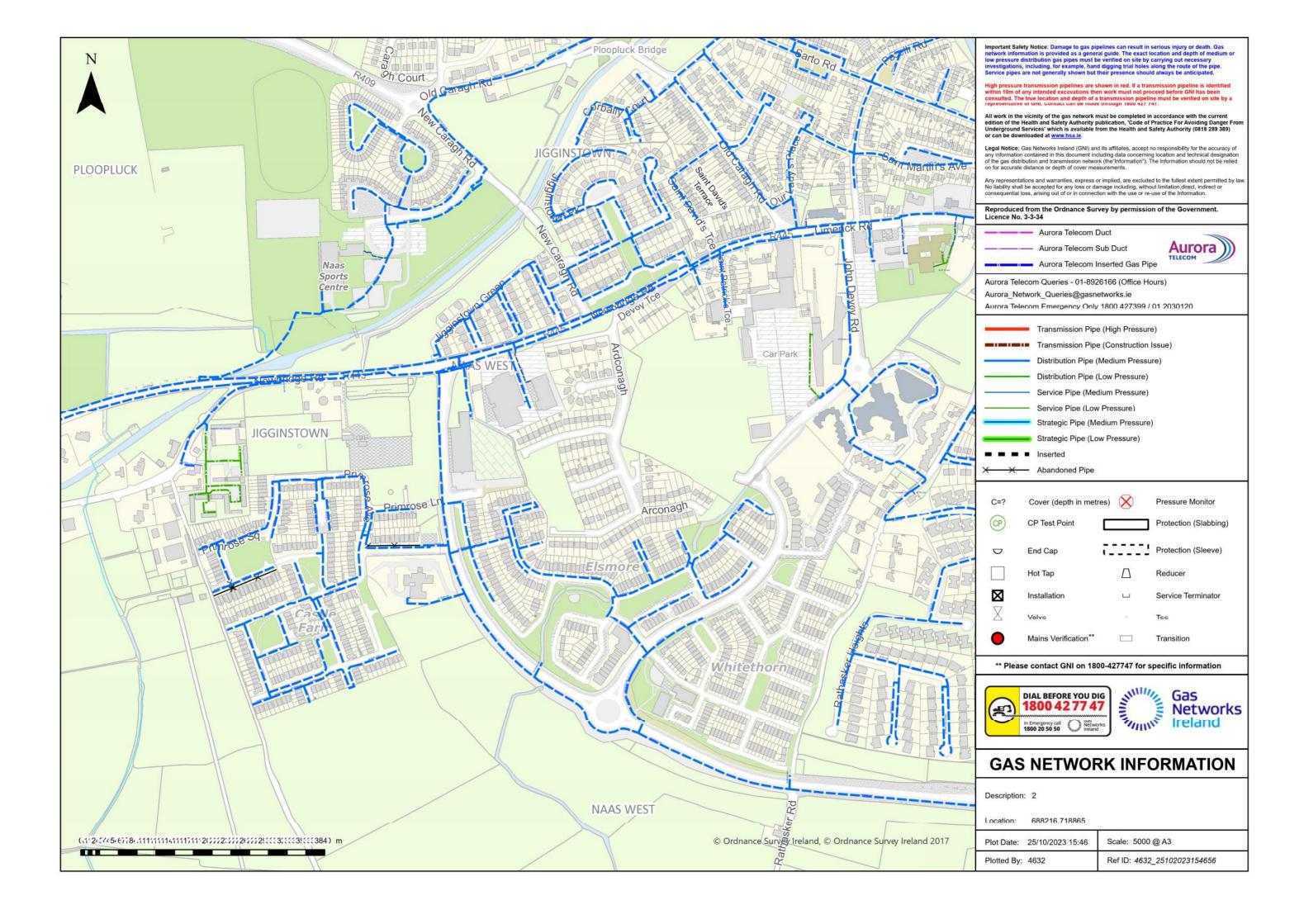


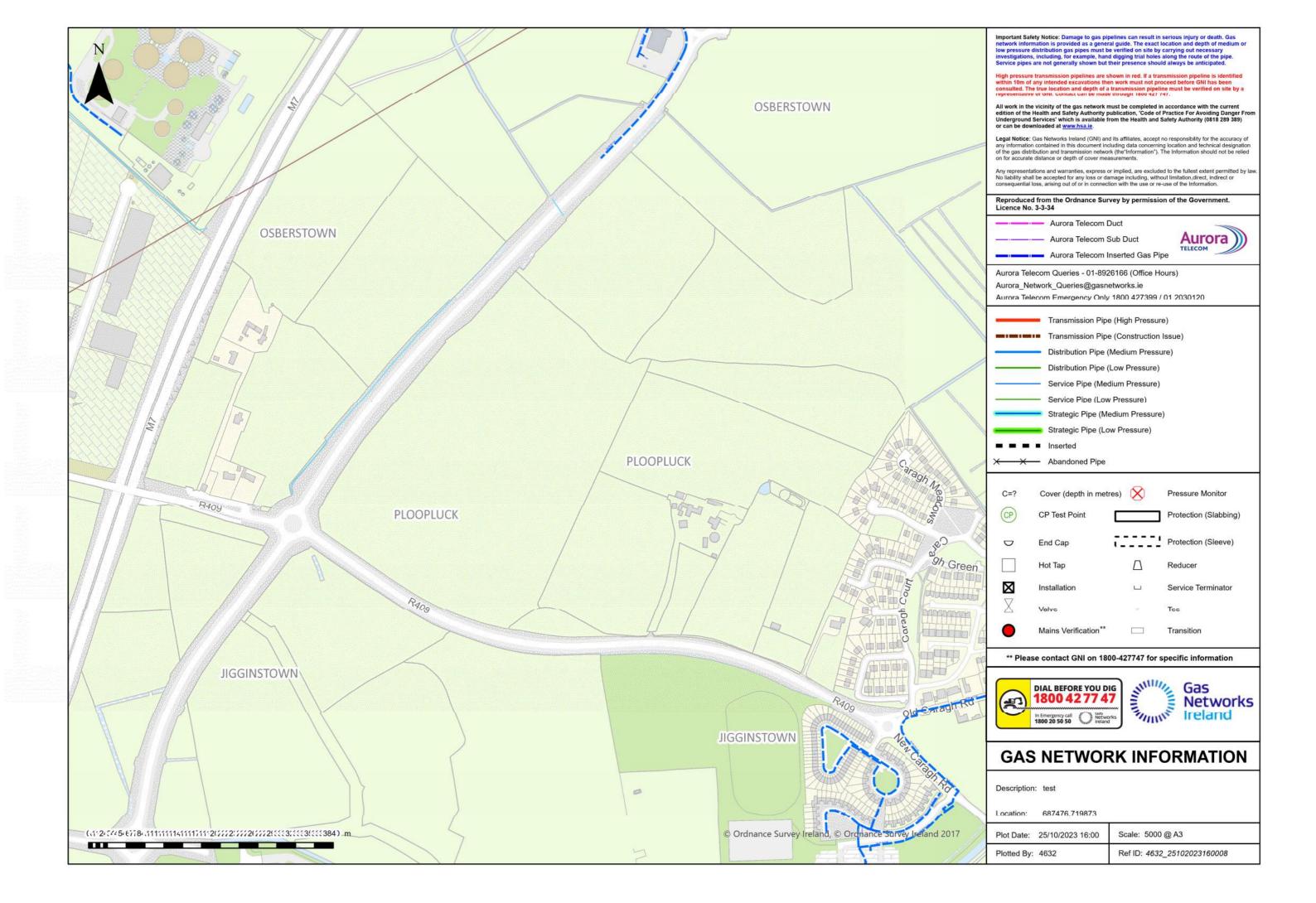














Appendix B – GNI Infrastructure Maps with Potential Route of New High-Pressure Pipeline Indicated

