

## 3.0 PLANNING AND ALTERNATIVES

### 3.1 INTRODUCTION

#### 3.1.1 Planning and Development Context

This chapter will examine the proposed development within the context of the Clare County Council (CCC) planning policy. The proposed development is described in detail in Chapter 2 (Description of the Proposed Development).

The site for the proposed development is situated within the administrative area of CC. The local planning and development policy framework with which the proposed development complies is defined by the Clare County Development Plan 2017 – 2023 (CCDP) and specifically Variation No.1 (adopted March 2019). Variation No.1 was undertaken to give effect “to the *Government Policy Statement on the Development of Data Centres* in Ireland by identifying in a plan led manner for the preferred location of a Data Centre in County Clare.”

The relevant national, regional and local planning policy with which the proposed development complies is defined by the:

- National Planning Framework: Project Ireland 2040 (2018);
- Our Sustainable Future - A Framework for Sustainable Development for Ireland (2012)
- Regional Spatial and Economic Strategy for the Southern Region (came into effect on 31st January 2020).
- Clare County Development Plan 2017-2023, (CCDP) including Variation No. 1 adopted March 11th 2019.
- SEA Environmental Report and Appropriate Assessment-Natura Impact Report that accompanies the Variation (2019)
- Shannon Town and Environs Local Area Plan 2012-2018 as extended.

The following sections describe how the proposed development is in compliance with the stated policies and objectives of CCC with respect to planning and sustainable development. The National and Regional Planning Context has been described further in the Planning Report produced by John Spain Associates (JSA, 2021) and included with the application documentation.

#### 3.1.2 Alternatives

The second half of this chapter will discuss alternatives. The EIA legislation and the prevailing guidelines (as set out in Chapter 2) and best practice require that EIA Reports provide a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the Applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, taking into account the environmental effects.

This chapter considers the main alternatives examined under each of the following headings and the reasons for the selection of the chosen option including consideration of environmental effects:

- Do Nothing Alternative;
- Alternative Locations;
- Alternative layouts/designs;
- Alternative processes/technologies; and
- Alternative mitigation.

Throughout the design process, the design alterations were undertaken to ensure that the proposed development layout was responsive to the existing site conditions receiving environment.

### 3.2 DEVELOPMENT CONTEXT

The development footprint is c. 60 hectares (ha) and are located to the east of Ennis in the townland of Tooreen and Cahernalough, Co Clare. The lands are bordered to the south by the R352 (Tulla Road) and to the west by the M18. The lands are traversed by a gas pipeline, overhead powerlines connecting to the existing Ennis 110kv Substation that adjoins the western boundary.

The site is currently in predominantly agricultural use and comprises a series of irregularly shaped fields divided by hedgerows and ditches typical of its agricultural setting.

The site benefits from a strategic location and is accessible from the M18 Motorway via the local road network (R352) at Junction 13 less than 1km from the site. The M18/N18 Motorway / Primary road connects the cities of Limerick and Galway.

The county town of Ennis is located immediately to the west, with Galway city centre 65 km north of the site, and Limerick c. 40 km south. The M18 motorway provides an excellent transport link north and south, and connects to the M6 and M7 Motorways.

The north, east and south of the proposed development site is largely defined by agricultural lands, as well as some once-off developments associated with these agricultural holding. The west of the site is bounded by the M18.

### 3.3 NATIONAL, REGIONAL AND LOCAL PLANNING CONTEXT

#### 3.3.1 National Planning Framework – Ireland 2040

The National Planning Framework (herein referred to as the NPF) was published in February 2018 and contains policies which are supportive of the development of information and communications technology (ICT) infrastructure, with particular reference to data centres.

National Strategic Outcome 5 of the NPF relates to the creation of “A Strong Economy Supported by Enterprise, Innovation and Skills”. This strategic outcome is underpinned by a range of objectives relating to job creation and the fostering of enterprise and innovation. One of the key objectives, relating to ICT infrastructure (including data centres) under National Strategic Outcome 5 is:

*“Promotion of Ireland as a sustainable international destination for ICT infrastructures such as data centres and associated economic activities.”*

The proposed development comprises a data storage facility and associated ancillary development, in a location which is well suited and serviced to accommodate such a use.

The NPF also states under National Strategic Outcome 5:

*“Ireland is very attractive in terms of international digital connectivity, climatic factors and current and future renewable energy sources for the development of international digital infrastructures, such as data centres. This sector underpins Ireland’s international position as a location for ICT and creates added benefits in relation to establishing a threshold of demand for sustained development of renewable energy sources.”*

The NPF notes that the data centre sector underpins Ireland’s international position as a location for ICT and creates added economic benefits by establishing ‘a threshold of demand for sustained development of renewable energy sources’. The proposed development will have a flexibility in supply during its lifetime which will allow for flexibility in sourcing of power including renewable sources where feasible.

In summary, the NPF encourages the location of ICT infrastructure in Ireland, and the proposed development, which comprises such ICT infrastructure, is therefore considered to be wholly in accordance with this key body of national planning policy.

### 3.3.2 Government Statement on The Role of Data Centres in Ireland’s Enterprise Strategy 2018

The Government Statement on The Role of Data Centres in Ireland’s Enterprise Strategy Prepared by the Department of Business, Enterprise and Innovation (June 2018). This statement highlights the fact that Ireland plays a significant role in the ICT sector, and emphasises the importance of data centres as they directly contribute to job creation and significant added economic benefits.

*The strategic approach aims to:*

- *Drive Ireland’s ambition in the digital economy as a location of choice for investment and a seed-bed for technology entrepreneurship across a range of sectors and activities;*
- *Contribute to regional development, deliver associated economic activities and support the creation of high quality, sustainable jobs;*
- *align enterprise electricity demand with generation capacity and transmission planning; and*
- *ensure that potential downside costs are minimised and that economic impact is optimised.*

Data Centre developments such as that proposed provide a range of services to other firms that undertake production, research and development, marketing, sales, service, and support activities in locations with no physical/geographic connection to the data centre.

The statement recognises that a large proportion of existing and planned data centres are located within the Dublin Region. This presents unique challenges for future planning and maintenance of a renewable power grid. To address this, upcoming policy documents will propose a variety of policies to support regional opportunities for data centre investment, thus reducing the need for additional grid infrastructure in Dublin.

The increased renewable electricity requirement linked to data centres will be mainly delivered by the development of the new Renewable Energy Support Scheme (RESS) which will also reflect falling costs across a range of renewable technologies and an ambition to increase community and citizen participation in renewable energy projects.

### 3.3.3 Regional Spatial and Economic Strategy for the Southern Region

The Regional Spatial and Economic Strategy for the Southern Region came into effect on 31<sup>st</sup> January 2020. The Regional Spatial and Economic Strategy (RSES) includes a policy objective which *supports the national objective to promote Ireland as a sustainable international destination for ICT infrastructure.*

The proposed development site forms part of a consolidation and expansion of an existing block of zoned land and is designated for a range of uses including data centre development. An important strategic role is envisaged for it in reinforcing the region and Ireland as a destination for ICT and the development of data centres.

### 3.3.4 Clare County Development Plans

The Clare County Development Plan (CCDP) 2017-2023 sets out a coherent spatial planning framework for the County within the context of national and regional policies.

The aim is to drive the present-day evolution of the county and to establish a framework for the coordinated and sustainable economic, social, cultural and environmental development of County Clare.

The relevant policies and objectives of the CCDP in relation to Water, Drainage, Environmental Services, Transport, Waste, Cultural Heritage, Natural Assets, Environment have been addressed in the relevant chapters of this EIA Report.

#### Variation No.1 to the CCDP

The members of Clare Co. Co. adopted Variation No.1 to the CCDP 2017-2023 on 11<sup>th</sup> March 2019 and a summary of the relevant aspects of the CCDP as varied is provided below.

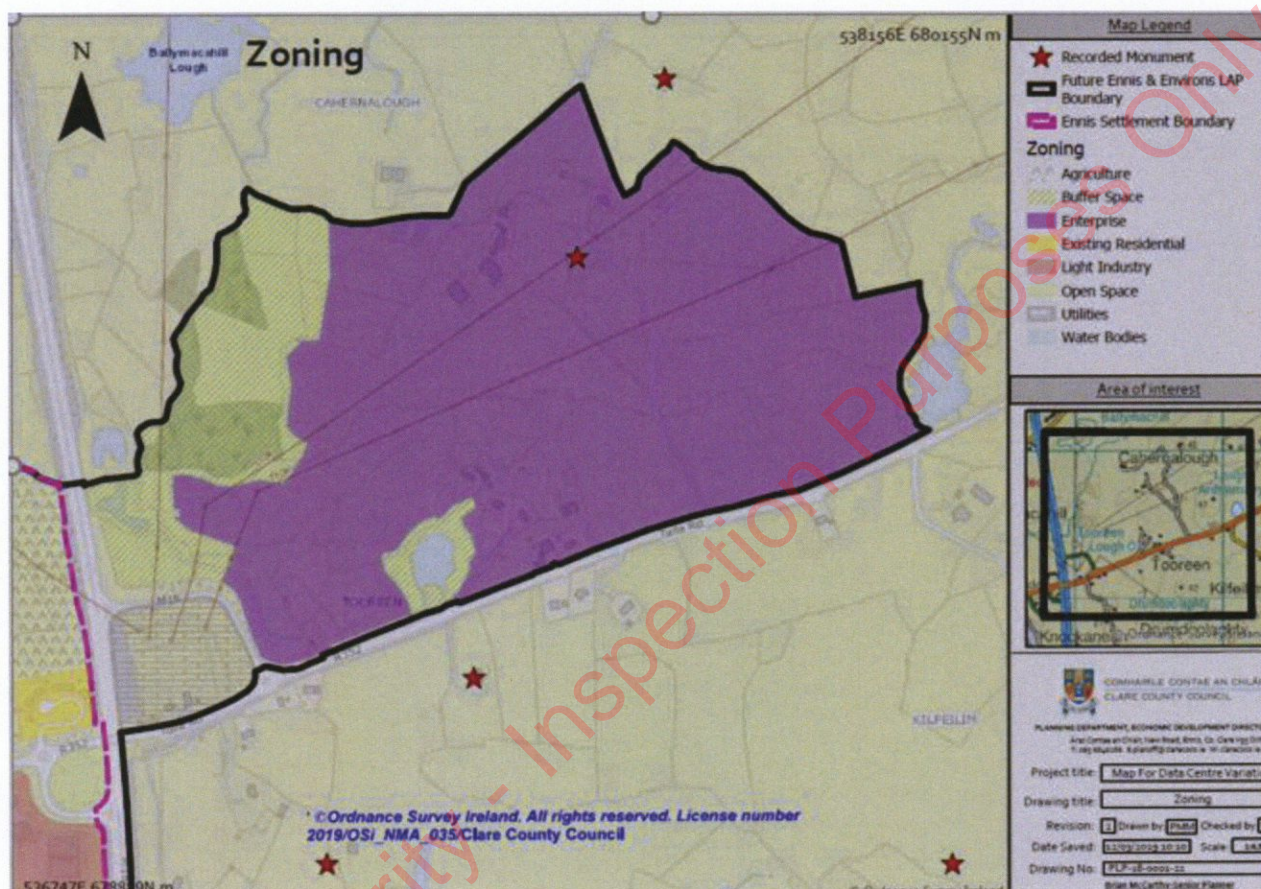
#### Zoning

The zoning objective for the lands currently identified in the Ennis Settlement plan were amended from Industrial (IND1) to Enterprise (ENT3) at Tooreen and extends the Enterprise ENT3 zoning objective to 45ha, onto lands currently identified as being in the open countryside. The amended map is shown as Figure 3.1 below.

The Variation state that the 55ha area site at Tooreen was *“identified and zoned as Enterprise (45ha) and Buffer (10ha) with a specific use for a Data Centre Campus due to; its proximity to the electricity sub-station; its proximity to the M18 motorway and adjoining regional road network; the location of the site relative to the Gas Pipeline; the availability of Dark Fibre and the proximity of the site to Shannon International Airport and Ennis Town.*

*This site is zoned to accommodate a Data Centre campus which consists of one or more structures, used primarily for the storage, management and dissemination of data and the provision of associated power electricity connections and energy generating infrastructure.”*

The Variation states that “lands zoned *enterprise* shall be taken to include the use and development of land for high end research and development, business science and technology-based industry, financial services, call centres/telemarketing, software development, datacentres, enterprise and incubator units, small/medium manufacturing or corporate office in high quality campus/park type development”.



**Figure 3.1** Zoning Map showing the site of the Proposed Development zoned for Enterprise (purple) and buffer zones (hatched green) (Source: Clare County Development Plan 2017 – 2023 Variation 1 ; Maps Ennis Settlement Plan zoning map March 2019))

A Strategic Environmental Assessment (SEA) and Flood Study was undertaken as part of the assessment of the Variation. Specific mitigation measures arising from the SEA, Habitats Directive Assessment and Strategic Flood Risk Assessment would need to be provided with any development proposal for the Toureen Area zoned as ENT3. The Variation incorporated additional text to section 2.13.5 Toureen Area, specifically identifying assessments which would be required for any development proposal. These are presented in Table 3.1 below with a summary of where they are fully addressed in this EIAR application and the planning submission.

**Table 3.1** Requirements for Development Proposals as outlined in the CCC Development Plan Variation 1.

| Assessment  | ART Datacentres Ennis Campus Development   |
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| A traffic management plan for the construction and operation phase of development | An outline Construction traffic management plan has been included as part of the Construction Environmental Management Plan (CEMP) |

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|  | produced by AWN and included with the planning documentation.  |
| Any proposed development shall adopt sustainable practice in terms of building design, materials, construction and practice.   | The design incorporates a wide range of measures such as sustainable drainage systems, harvesting of rainwater, solar panels and reuse of waste heat within the proposed onsite-vertical farm. The proposed site layout has minimised the requirement for off-site disposal of soil .<br><br>For additional information on sustainability within the design refer to the Energy and Sustainability report provided with Planning and Chapter 2 (Description of Proposed Development.).   |
| A hydrological assessment to determine the effects of the development on groundwaters and groundwater quality  | A hydrological assessment of the proposed development is included as part of Chapter 5 (Soils, Geology and Hydrogeology) of this EIAR.   |
| At the southern end of the site is a mesotrophic lake, which will require protection through the provision of a buffer incorporating the dense clump of trees to the west of the lake and shall be included in the overall Landscape Management Plan for the site.   | The proposed development design has incorporated suitable buffers around Toureen Lough and other identified ecological areas. See Landscape Management Plan provided with planning and Chapter 8 (Biodiversity) and Chapter 10 (Landscape and Visual Impact ) of this EIAR   |
| A Construction and Environmental Management Plan shall be submitted as part of the development proposals on the site. This shall include a Flood Risk Assessment, a Surface Water Management Plan for the construction and operation of the development, a Pollution Prevention Plan and shall incorporate principles of Sustainable Urban Drainage Systems. During the construction phase of developments on site where applicable all relevant best practice guidelines shall be adhered to.                             | A Construction and Environmental Management Plan (CEMP) has been submitted as part of the planning application. The CEMP incorporates a; Flood Risk Assessment; a Surface Water Management Plan for the construction and operation of the development , a Pollution Prevention Plan. Further details and an impact assessment is included within Chapter 6 (Hydrology) of this EIAR.<br><br>Further details of Surface Water Management Plan for the operation of the development and SuDs design are included in the Engineering report prepared by CSEA. |
| An Air Quality Impact Assessment with reference to potential impacts on European Sites and the surrounding area within the zone of influence of the proposed development shall be submitted, this shall inform an Appropriate Assessment Screening and/Natura Impact Report.   | An Air Quality Impact Assessment with reference to potential impacts on European Sites is included in Chapter 8 (Air Quality and Climate) of this EIAR. An Natura Impact Statement (NIS) is submitted with the planning submission and also discussed in Chapter 7 (Biodiversity) of this EIAR.  |
| The hedgerows and scrub area on this site provide a foraging and commuting area for wildlife including Lesser Horseshoe bats. Future development proposals must be informed by a series of bat surveys to record the known usage of the site by in particular Lesser Horseshoe bats and ensure that there is no net loss of supporting habitat. The surveys must include a full light spill modelling study. Any habitat loss must be offset by additional landscape planting to ensure connectivity across the landscape. | Chapter 7 (Biodiversity) of this EIAR includes relevant bat surveys and assessments. The proposed development has been designed to minimise habitat loss. The development will require loss of hedgerows low ecological value, however additional landscaping will provide a greater density of habitat for improved biodiversity on the site.<br><br>The site is designed to be a dark site and a light spill modelling study is included in the planning submission.   |
| Impact of development of the site on conservation interest bird species of surrounding SPAs and breeding birds should be avoided, through protection and retention of breeding bird habitat in accordance with the Wildlife Acts. Development proposals for the site shall be accompanied by bird surveys (to include winter bird survey) to assess the use  | Chapter 7(Biodiversity) of this EIAR includes relevant Bird surveys and assessments of habitats.<br><br>The development will require loss of existing hedgerows however, the overall landscape plan will incorporate approximately three times of the extent of existing hedgerows on site (see Chapter 10). No  |

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| of the site by bird species and where disturbance and /or displacement is predicted appropriate mitigation measures shall be identified. Hedgerow and treeline pruning or removal shall be conducted outside the breeding bird season (March 01 <sup>st</sup> through August 31 <sup>st</sup> ). | pruning or removal will be conducted in the breeding bird season.   |
| An Ecological Impact Assessment (designed by an appropriately qualified landscape architect and ecologist) and a Habitat Survey shall form part of development proposals for the site.   | Chapter 7 (Biodiversity) and 10 (Landscape and Visual Impact Assessment) of the EIAR includes a habitat survey and Landscape plan. These are prepared by appropriately qualified ecologists and landscape architects. |
| A Landscape and Biodiversity Management plan shall be submitted to provide landscape, visual and environmental screening and enhancement measures through planting and design.   | The planning submission includes a Landscape and Biodiversity Management Plan. This includes considerable screening and enhancement measures.   |
| An Invasive Species Survey and Management plan (if required) shall accompany development proposal for the site.  | The Ecological surveys on site included a survey of invasive species. No invasive species were identified by the ecologist and therefore no Management Plan is provided.  |
| Development proposal shall also include an Otter Use Survey of the site, and where disturbance and/or displacement are predicted appropriate mitigation measures shall be identified.  | An Otter Use Survey and appropriate mitigation is included in Chapter 7 of the EIAR   |
| A buffer will be required to be provided with regard to the location of a National Monument (CL-034-007) on site.  | The proposed layout includes a buffer zone around the Recorded Monument on site. Relevant mitigation measures are outlined in Chapter 11 of the EIAR.   |
| Adequate wastewater treatment and disposal measures shall accompany development proposals for this site to ensure that there is no impact on water quality in the area.  | Wastewater will be discharged in compliance with Irish Water requirements. Details are provided in the Engineering report prepared by CSEA and Chapter 13 of the EIAR.  |

### 3.4 SUSTAINABLE DEVELOPMENT

An Energy and Sustainability Statement prepared by Hurley Palmer Flatt is provided with the planning submission. The document presents relevant national and local planning policy and guidance in relation to sustainability. All of these aspects will be integral considerations in the operation of the proposed development on a day-to-day basis and are addressed within this EIA Report and the Energy and Sustainability report.

The project is compliant with national policy and guidance:

- Project Ireland 2040 – National Planning Framework which sets out the strategic importance of data centres in Irelands Enterprise Strategy,
- National Climate Change Adaptation Framework (DECLG 2012),
- Government Policy Statement on the Development of Data Centres in Ireland (2018),
- The National Climate Action Plan (CAP) 2019-2024,
- IS 399:2014 “ Energy Efficient Design Management- Requirements with Guidance for Use” written by Sustainable Energy Authority of Ireland (SEAI) and the National Standards Authority of Ireland (NSAI),
- Sustainability Ireland's Framework for Sustainable Development 'Our Sustainable Future' (launched 2012 with subsequent progress report in 2015),

by the Department of the Environment, Community and Local Government. It provides a framework to ensure that development is undertaken in a sustainable manner.

'Our Sustainable Future' aims to ensure that development is carried out sustainably and in an environmentally sound manner which includes optimisation of natural resources, minimisation of waste, safe and sparing use of chemicals and the application of clean technology.

Table 3.2 sets out relevant guidance relating to energy and sustainability within the CCC development plan. The proposed development meets these objectives through efficiencies in design as outlined in Chapter 2 and the Energy and Sustainability Statement prepared by Hurley Palmer Flatt provided with the planning submission.

Table 3.2 CCDP Energy Efficiency and Sustainability, Relevant Objectives and Policies

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|--------------|---|
| CDP OBJ 17.3 | <p>Sustainable Developments</p> <p>To require all new developments to maximise energy efficiency and conservation and to ensure that they embrace the concept of sustainable design, achieve excellence in siting and design and promote the use of low carbon materials.</p>   |
| CDP OBJ 17.4 | <p>Design and Built Environment</p> <p>To encourage and facilitate excellence in the siting and design of new buildings in the county and particularly through contemporary and innovative architectural solutions;</p> <p>To encourage and facilitate high standards of energy efficiency;</p> <p>To facilitate and promote the use of appropriate low carbon materials in all future developments and embrace the principles of sustainable design;</p> <p>To run a Design Scheme to encourage excellence in the built environment.</p>   |
| CDP OBJ 18.3 | <p>Development of a Low Carbon Economy</p> <p>To promote County Clare as a Low Carbon County as a means of attracting Inward Investment to the County and Mid-West region;</p> <p>To facilitate measures to establish a low carbon economy and society by 2020;</p> <p>To facilitate the development of energy sources which will achieve low carbon outputs;</p> <p>To support sustainable modes of transport such as walking and cycling through promotional strategies and the provision of infrastructure where required;</p> <p>To work to Implement the provisions of <i>Ireland's Transition to a low carbon Energy Future 2015 – 2030</i> as they relate to County Clare.</p>   |
| CDP OBJ 18.4 | <p>Energy Efficiency</p> <p>To assist in reducing the County's dependence on imported fossil fuels and to develop a low carbon economy by;</p> <p>Promoting innovative new building design that demonstrates a high level of energy efficiency and the use of renewable energy resources, in accordance with national regulations and policy requirements;</p> <p>Promoting the development and use of alternative energy vehicles in line with the concept of smarter Travel and to encourage and facilitate the development of ancillary infrastructure;</p> <p>Promoting energy conservation, energy efficiency and use of renewable sources in the production of all goods and services in accordance with national, regional and County regulations and policy requirements;</p> <p>Facilitating the provision of installations for powering the electric vehicles at convenient locations across the County</p> |



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| CDP OBJ 18.5 | <p><b>Distributed Heat</b></p> <p>To support and encourage the development of Distributed (District) Heating, in compliance with the objectives set out in chapter 14, as a means of facilitating;</p> <p>The increased use of heat generated from indigenous, low carbon, renewable resources (bioenergy, solar, geothermal etc.);</p> <p>The utilisation and distribution of useful waste heat from large thermal processes;</p> <p>The utilisation and distribution of useful heat from combined heat and power (CHP) Plant, where such a plant's primary energy is met by indigenous, low carbon, renewable resources (bio energy, solar, geothermal etc.).</p> |
|--------------|---|

### 3.5 PLANNING PERMISSIONS

As part of the assessment of the impact of the proposed development, account has been taken of developments that are currently permitted, or under construction and substantial projects for which planning has been submitted within the surrounding areas.

The CCC Planning Department website was consulted in order to generate a list of granted planning permissions from the surrounding areas of the Proposed Development within the previous five years. The outcome of the planning search is presented in Appendix 3.1 (planning permissions within 2 km of the proposed development) and Appendix 3.2 (Regional planning search). The developments listed in Appendices 3.1 and 3.2 have been considered where appropriate throughout the EIA Report, and in the cumulative impact assessment within each chapter.

### 3.6 CONSULTATION WITH CLARE COUNTY COUNCIL PLANNING DEPARTMENT

AWN, the Applicant and the project team have liaised with the relevant departments of CCC in advance of lodgement of this application. A number of pre-planning consultations took place with CCC including 24<sup>th</sup> June 2020, 3<sup>rd</sup> March 2021 (site walkover), 25<sup>th</sup> March 2021, 30<sup>th</sup> April 2021 (consultation with CCC Water Services and Road Design), May 21<sup>st</sup> and June 8<sup>th</sup> 2021 (follow up consultation re Road and Water Services)AWN and the other respective EIA contributors/authors have incorporated advice and comments received from individual consultation with members of CCC into the relevant chapters of this EIA Report.

### 3.7 PLANNING CONCLUSIONS

The proposed development will be in keeping with all of the aspects of the relevant policy documents as described in Section 3.2 and 3.3 above. The proposed development will be situated on lands specifically zoned for a datacentre and energy generation type development as outlined in CCC Development Plan Variation no 1.

In conclusion, it can be stated that the proposed development complies fully with the policies and objectives of CCC regarding the conservation, protection and enhancement of environmental resources and assets of the region and will deliver a key piece of infrastructure in support of the economic development of the mid-west region.

## 3.8 ALTERNATIVES

### 3.8.1 Do Nothing Alternatives

The site is currently predominantly greenfield but zoned for development. The 'do nothing alternative' would result in no development occurring on site, and the site remaining greenfield until such time as an alternative development consistent with the land use zoning is granted permission and constructed. Located in lands zoned *enterprise*, it is likely that the lands would be developed for a similar enterprise development rather than remaining greenfield. The Do-Nothing scenario has been considered in each chapter of the EIA Report.

### 3.8.2 Alternative Locations

The applicant has considered two main components to assess alternative project locations:

- (i) Selection of preferred country

Ireland is considered the most optimal location for datacentre developments based on the following:

"In general, Ireland is a suitable location for data centre developments due to the moderate climate, which means that data storage facilities here can be cooled primarily using outside air (via roof mounted air handling units). This reduces the need for additional, more energy intensive forms of cooling, which often can be required elsewhere around the world. This also benefits the facilities sustainability as data storage facilities in Ireland require far less air conditioning and temperature control systems, which means substantially less power and water demand requirements. This has the effect of reduced air and noise emissions compared with countries with a warmer climate.

Additionally, Ireland has a skilled workforce, a stable political and regulatory system, and government policies that enable large-scale renewable power projects. Certain advantages of locating data centres in Ireland are detailed in recent reports such as *A Study of the Economic Benefits of Data Centre Investment in Ireland*, May 2018 commissioned by the IDA Ireland and the Government Statement on *The Role of Data Centres in Ireland's Enterprise Strategy* prepared by The Department of Business, Enterprise and Innovation."

- (ii) Selection of preferred site location

Alternative locations were considered under the SEA completed for Variation No 1 (adopted March 2019), of the Clare County (CCC) Development Plan 2017 – 2023 (CCDP). Section 7.3 of the SEA outlines the site selection process and assessment of alternative sites (Section 7.3 Tables 10 and 11). Seven sites were identified by CCC and at strategic level met a number of criteria for potential data centres including high speed broadband in the vicinity, proximity to motorway and national route infrastructure and proper planning and sustainable development such as zoning of the site. 16 additional sites (provided following an expression of interest) were assessed similarly on land use. Section 7.4 of the SEA concluded "from the above evaluation, the lands at Toureen emerged as the preferred lands for a potential data centre development. This site is the preferred area at strategic level, in terms of balancing the objectives of the Proposed Variation with environmental considerations including proper planning and sustainable development".

The EIA team has reviewed the criteria used in this assessment and concur with the evaluation given. It can be seen from the evaluation that based on the land use and zoning information available that the likely environmental effects are similar for most sites and could be mitigated at site level following additional assessment and mitigation.

In addition, an alternative site assessment has been completed by the EIA team

The applicant had undertaken due diligence of four locations:

- 1) Ballymaley Business Park Ennis-
- 2) Quinn Road Business Park
- 3) Roche Ireland
- 4) Toureen

An explanation of the criteria used in the evaluation is given in Table 3.2 below.

Table 3.3 Criteria for the evaluation of risk.

| Environmental Criteria   |  |
|--|--|
| Human Health and Population <ul style="list-style-type: none"> <li>• Health Impacts – Higher density population has higher risk of dust and noise during construction</li> <li>• Economic Impact</li> </ul>                | Land, Soils, Geology & Hydrogeology <ul style="list-style-type: none"> <li>• Geological Heritage</li> <li>• Presence of contaminated land</li> <li>• Economic reserve and land use</li> <li>• Aquifer resource and impact on existing water supply</li> <li>• Aquifer vulnerability and water quality</li> </ul> |
| Water & Hydrology <ul style="list-style-type: none"> <li>• Natural hydrological regime and water quality</li> <li>• Flood risk</li> </ul>  | Biodiversity <ul style="list-style-type: none"> <li>• Potential impact on habitats of high ecological value</li> <li>• Potential impact on protected and designated habitats/sites</li> </ul>  |
| Landscape & Visual Impact <ul style="list-style-type: none"> <li>• Desktop review of development Plan landscape and visual sensitivity</li> <li>• Identification of likely visual receptors (higher population)</li> </ul> | Archaeology, Architecture & Cultural Heritage <ul style="list-style-type: none"> <li>• Review of Department of Arts, Heritage, Regional and Rural and Gaeltacht Affairs Archaeological Survey database.</li> </ul>   |
| Traffic & Transportation <ul style="list-style-type: none"> <li>• Status of current road network and Potential for sustainable modes for workforce</li> </ul>  | Material Assets <ul style="list-style-type: none"> <li>• Ownership and Access</li> <li>• Availability of utilities</li> </ul>  |

Table 2 below presents a comparison of assessed risk to environmental criteria for each of these alternative sites based on a desk top assessment using available information. The sites are given a **low (green) medium (orange) or high (Red)** environmental risk rating for each environmental criteria.

Table 3.3 Evaluation of risk for environmental criteria for alternative locations.

| Criteria   | Ballmaley Business Park   | Quin Road   | Roche Ireland   | Toureen   |
|--|---|---|---|---|
| Human Health & Population (air, dust, noise vibration impacts) | Medium population density resulting in medium sensitivity environment for dust noise vibration and human health impacts during construction   | Medium population density resulting in medium sensitivity environment for dust noise vibration and human health impacts during construction   | Medium population density resulting in medium sensitivity environment for dust noise vibration and human health impacts during construction   | Low population density resulting in low sensitivity environment for dust noise vibration and human health impacts during construction   |
| Land soils geology hydrogeology                                | <p>Medium</p> <p>-The site is underlain by a Regionally Important Aquifer - Karstified (conduit) with a medium to extreme aquifer vulnerability</p> <p>- There are no licensed landfills or section 22</p> <p>illegal landfills within 500m of the site</p> | <p>Medium</p> <p>-The site is underlain by a Regionally Important Aquifer - Karstified (conduit) with a medium to extreme aquifer vulnerability</p> <p>- There are no licensed landfills or section 22</p> <p>illegal landfills within 500m of the site</p> | <p>High</p> <p>-landfill on site undergoing remediation</p> <p>-High Aquifer vulnerability)</p> <p>Regionally Important Aquifer - Karstified (conduit)</p>                                  | <p>Medium</p> <p>-The site is underlain by a Regionally Important Aquifer - Karstified (conduit) with a medium to extreme aquifer vulnerability</p> <p>- There are no licensed landfills or section 22</p> <p>illegal landfills within 500m of the site</p>                         |
| Water and Hydrology  | <p>Low</p> <p>-no open water onsite</p> <p>- No identified flood zones present on site</p>  | <p>High</p> <p>-Direct hydrological connectivity to Lower River Shannon SAC (within 25m)</p> <p>- Within River and Coastal Low probability flooding zones (0.1% AEP)</p>  | <p>Medium</p> <p>- River Shannon and River Fergus Estuaries APA and Fergus Estuary and Inner Shannon, North Shore pNHA (within 15 m)</p> <p>- No identified flood zones present on site</p> | <p>Medium</p> <p>- Direct hydrological connectivity to Ballymacahill river</p> <p>- no risk of flooding affecting the site from fluvial or coastal sources, site lies within Flood Zone C (i.e., where the probability of flooding from rivers is less than 0.1% or 1 in 1000).</p> |
| Ecology  | <p>Low</p> <p>-No direct connection to the River Shannon SAC or known</p>   | <p>High</p> <p>-Direct hydrological connection to Lower River Shannon SAC (within 25 m)</p>   | <p>High</p> <p>-Direct hydrological connection to River Shannon and River Fergus Estuaries SPA</p>  | <p>Medium</p> <p>-Hydrological pathway to the River Shannon SAC is &gt; 2 km from the site</p>  |

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|                                 | areas of designated habitat. Closest protected habitat is Ballyallia Lake SAC/SPA/pNHA.  | - no known areas of designated habitat on site.   | and Fergus Estuary and Inner Shannon, North Shore pNHA (within 15 m)<br><br>- no known areas of designated habitat on site.                           | -Areas of designated habitat on site which require mitigation   |
| Traffic and Transport           | Low – Good access to national and regional road network<br><br>Medium - Potential for sustainable modes for workforce  | Medium – less well connected to national and regional network<br><br>Medium - Potential for sustainable modes for workforce   | Low – Good access to national and regional road network<br><br>Medium –<br><br>Potential for sustainable modes for workforce                          | Low – Good access to national and regional road network<br><br>Medium - Potential for sustainable modes for workforce   |
| Landscape Character             | Medium<br><br>– Lands not located in area of high amenity or in area designated as heritage landscape<br><br>-little potential for reducing visual impact with landscaping | Medium<br><br>-Site Within Ennis town urban landscape<br><br>-not located in area designated as heritage landscape<br><br>-little potential for reducing visual impact with landscaping | Low<br><br>- lands not located in area of high amenity, - heritage landscape to south of site   | Low<br><br>– lands not located in area of high amenity area or designated as heritage landscape<br><br>-Natural topography low, facilitates the scale of the development within the landscape and good opportunity for reducing visual impact with landscaping, |
| Archaeology & Cultural Heritage | Low<br><br>-No recorded monuments on or adjacent to site)<br><br>-Not located in heritage protection area.   | Low<br><br>-No recorded monuments on or adjacent to site)   | Low – No recorded monument on site, Burial ground adjacent)   | Medium<br><br>-Ringfort located on site which requires local mitigation.  |
| Material Assets                 | High<br><br>-required landbank not available for datacentre and energy centre<br><br>-limitations to electrical and gas  | High<br><br>-required landbank not available for datacentre and energy centre<br><br>-limitations to electrical and gas supply (medium to   | Medium<br><br>– lands not currently available as undergoing remedial works and licence surrender and limitation on area for expansion and landscaping | Low<br><br>-Lands available and good access<br><br>-Direct access to electrical substation and high pressure gas pipeline   |

|  |  |   |   |   |
|--|--|---|---|---|
|  | supply (medium to high pressure gas mains)<br><br>- currently sufficient waste management capacity within the surrounding area | high pressure gas mains)<br><br>-currently sufficient waste management capacity within the surrounding area | -limitations to electrical and gas supply (medium to high pressure gas mains)<br><br>- currently sufficient waste management capacity within the surrounding area | -Currently sufficient waste management capacity within the surrounding area |
|--|--|---|---|---|

It can be seen that the sites are similar for many environmental considerations. Quin Road site has high risk for three criteria: hydrological connectivity within close proximity to the SAC, absence of medium to high pressure gas and available landbank. The Roche site similarly has hydrological connectivity within close proximity to the SAC, absence of medium to high pressure gas and due to the remedial works required on site is not currently available for redevelopment. The Ballmaley Business Park does not have access to medium to high pressure gas and does not have available land bank for the proposed development.

In summary, on the basis of material asset considerations i.e availability of the necessary land bank (within the proposed timeline for the project) and proximity to necessary power (electrical and high pressure gas) for the proposed development of a datacentre and energy centre, the site at Toureen was chosen as the preferred site. Assessment of the environmental constraints identified at Toureen show that these can be easily managed by excluding development from ecological and archaeological buffer zones and lands identified as prone to localised flooding with standard good practice mitigation during construction and operation.

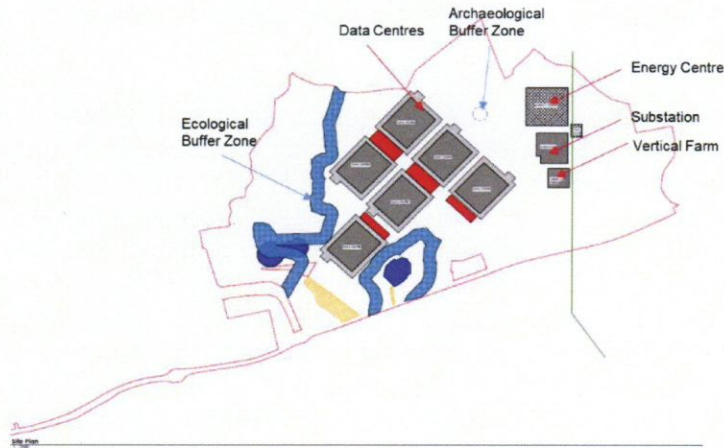
### 3.8.3 Alternative Layouts/Designs

In the preparation for Proposed Development, a number of alternative arrangements and configurations for the Proposed Development, roadways and parking arrangements were considered.

Alternatives for the datacentre building layout is limited due to:

- the need to take advantage of the lower topographical area of the site, in order to minimise visual impact,
- to fit the buildings and associated development within the available area of the site outside of ecological and archaeological buffer zones, i.e to reduce potential for environmental and cultural heritage impact,
- the necessary wayleave for the fort and buffer zones
- adherence to other minimum distances between different components, e.g. between residences and data halls, data halls and substation buildings and the gas line.

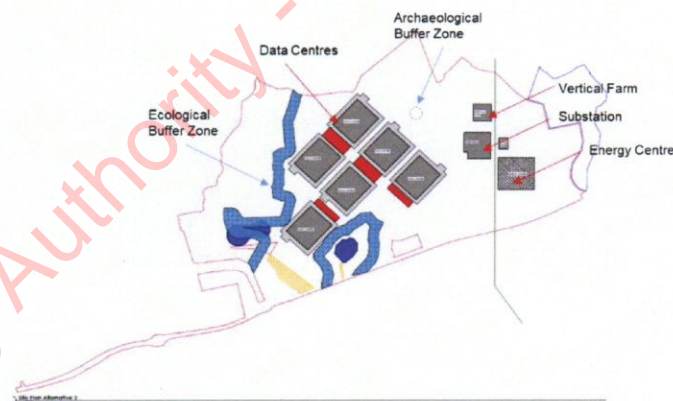
Alternative locations for the energy building have been considered as illustrated in Figure 3.1-3.3.



**Figure 3.2** Proposed Layout (Layout 1 – "the proposed layout")



**Figure 3.3** Proposed Layout (Layout 2) Alternative location of Substation and Vertical farm



**Figure 3.4** Proposed Layout (Layout 3) Energy centre located further south than Option1 (Proposed Development)

The environmental sensitivities associated with each surrounding land use were considered i.e. the proximity to the buffer zones for ecology and archaeology, ecological habitats for bats and occupied residences along the Tulla road.

There were no perceptible differences identified between the three options in terms of the potential for impacts on cultural heritage or air during construction and operation with mitigation in place. Regardless of the option selected, the air quality modelling was able to establish the appropriate stack height (see assessment in Chapter 8 and Table 3.1 below) to ensure adequate air dispersion and therefore compliance with all National and EU ambient air quality limit values and, therefore, none of the options would result in a significant impact on air quality or human health once operational. In

regard to archaeology all options have similar potential impacts pre and post mitigation requirements.

Layout 2 would have a lower fill requirement than Layout 1. Layout 3 would result in a requirement for a significant additional soil and rock excavation and which in turn would result in a greater impact on construction traffic, soils and geology, material assets and waste management. The Waste Management Hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling/recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. With respect to traffic impact, the additional subsoil removal would result in additional traffic movements to remove the soil from the site. The additional subsoil removal would result in additional heavy goods vehicle movements to and from the site. It would also result in additional noise and dust generation from the excavations at the site.

During operation all three options have similar impacts. However, layout 3 would have the most impact in terms of visual impact from the Tulla road. Layout 3 would also require more significant mitigation to minimise noise impact outside the site boundary. Layout 2 would result in the destruction of a brown long-eared bat roost, and would be within the 30m disturbance free zone of a pipistrelle bat roost. Layout 2 would also disrupt the normal commuting range of roosting bats within the site to areas used for commuting and foraging.

Layout 1 was selected as the preferred option for the proposed development. Other than the environmental considerations summarised above, the preferred site layout was determined based on the following factors:

- Orientation of the data storage facility buildings to optimise the use of the space available and location in the lowest area of the site, furthest away from the Tulla road to minimise visual impact.
- Maximises opportunities to reinforce the existing landscape and vegetation and promoting biodiversity.
- All bat roosts within the proposed development are maintained and protected from development with a 30m no disturbance zone in place.
- Commuting and foraging corridors for bat species along hedgerows and treelines are retained and/or enhanced to ensure the site maintains suitability for local bat species throughout; along the boundaries of the site, from east to west, and north to south.
- Minimises the cut and fill requirement.
- Establishes a simple, regular road layout on the site with the buildings occupying the central part of the site, avoiding pinch points and creating space for ancillary elements (construction compound, attenuation, sprinkler compound etc.).

#### 3.8.4 Alternative Processes and Technologies

Alternative technologies have been considered by the project design team based on many factors including technical feasibility, environmental impact, efficiency, security, reliability and cost.

The *Energy and Sustainability Statement* which accompanies the planning application details the assessment process and estimated CO<sub>2</sub> savings achieved through the integration of passive design, energy efficiency measures and Low and Zero Carbon



(LZC) technologies. It also sets out how the Irish Building Regulations technical Guidance Document Part L 2017 and the CCC Development Plan planning policies regarding energy and CO<sub>2</sub> emissions have been addressed.

#### Energy Efficiency

A number of alternative energy efficiency measures have been considered to achieve overall CO<sub>2</sub> reduction targets in the final design. These are summarized below and in more detail within the *Energy and Sustainability Statement* (section 4.4.4) provided with planning.

#### Consideration of alternative use of waste heat

As outlined in the HDR Energy and Sustainability Statement (section 4.6.2 and 4.6.3), an assessment of the high-grade heat from the gas powered generators has been undertaken. This assessment shows that high grade heat could be exported to a local development in need of heat such as residential or other uses. Given that there are no known exact locations selected for future district heating networks in the vicinity of the proposed development, a connection to a district heat network has not been included in the final proposals. However, what is proposed is to provide a set of flow and return pipes from the Energy Centre to the edge of the Art Data Centre to allow for onward connection by others to either a local requirement for heat or a future heat network.

*The opportunity to export waste heat from the data halls to an on site vertical farm is proposed as both are 24/7 requirements*

#### Consideration of Alternative Renewable Energy Sources

As set out in the *Energy and Sustainability Statement* (section 4.7), the following localised energy generation technologies are considered viable for the site: Electric heat pumps and Photovoltaics. The following localised renewable energy technologies have been considered as non-viable for the site due to space requirements and cost: solar thermal, wind turbines, biomass heating scheme, biofuel combined heat and power and fuel cells. The feasibility assessment considered technical feasibility followed by assessment based on economic and local planning feasibility.

#### Consideration of Alternative Cooling Systems

The data halls are intended to be air cooled by free fresh air, using air handling units with the facility for having adiabatic cooling during unusual high temperature periods (temperatures typically greater than 27°C). The adiabatic water requirement will vary with the seasons and as the water is used for an adiabatic process, the discharge of waste water will be minimal.

The alternatives to free air cooling considered by the Operator were as follows:

1. Air cooling by chiller and CRAC (computer room air conditioning)
2. Air cooling by indirect air-cooling AHU (air handling unit)
3. Chilled-water cooling derived from free-cooling, hybrid cooling towers with chiller assist

Air cooling by chiller and CRAC: This chilled-water solution serves Crac downflow units

typically serving cold air to the data storage hall white space through a floor void. Crac units normally include humidification elements to control the static electricity and all hot air is redirected back into the Crac to remove the heat for redistribution into the white space. The source of the cooling water is via a traditional refrigeration chiller located externally, usually on the roof. This is the traditional tried and tested cooling method. However, experience on other datacentre developments has shown it can create hot spots where cooling is not adequate and inefficiencies and does not allow for free cooling.

Air cooling by indirect air-cooling (IAC) AHU: This 'all air'-based cooling solution incorporates air handling plant mounted externally to the white space. Treated air is distributed to the white space via ductwork or through a plenum. Air is supplied at a relatively low velocity to the cold aisle, giving more control than traditional floor-void distribution. The hot air is returned to the IAC via ductwork and is cooled by the outdoor ambient air at a plate heat exchanger. To assist the cooling process during warm months, the ambient air is adiabatically cooled (water evaporation), which then cools the warm air at the plate heat exchanger in the IAC unit. The water used for adiabatic cooling is bulk-stored in the event of a mains supply outage. The process water is distributed from a central pump plantroom to the IAC units. This is a proven, cost effective technology but it can result in acoustic challenges (elevated external noise emissions) in comparison to the other alternatives.

Chilled-water cooling derived from free-cooling, hybrid cooling towers with chiller assist: This chilled-water solution serves Crac downflow units typically supplying cold air to the white space through a floor void. The source of the cooling water is via 'free cooling' cooling towers located externally, usually on the roof. Ambient air is used to cool the warm return water from the Crac units, with adiabatic cooling added during the warmer months. At peak times, when approaching the towers' cooling-load limits, refrigeration chillers are used to run in parallel with the cooling towers. This requires large plant space, there is increased risk of water leaks and higher maintenance costs than the previous two alternatives.

Other than a difference in water and power consumption requirements and acoustic performance (noise emissions to the atmosphere), there were no perceptible differences identified between the three alternatives options for the other environmental aspects.

Free air cooling, which is the system proposed, requires a high capital investment but lower operating costs and results in lower water and power consumption and lower noise emission than the alternatives considered.

#### Emissions Treatment Technologies

The use of selective catalytic reduction (SCR) was considered for the proposed development. SCR is an exhaust after-treatment technology which abates NO<sub>x</sub> emissions. The SCR technology involves injecting a urea-water solution into the exhaust gas stream in combination with a special catalyst unit. The advantage of SCR is the reduction in NO<sub>x</sub> emissions. The disadvantages include the space required for the catalyst, the high capital and operating costs and the potential for urea slip and deposit formation (however, it is noted that the latter two potential disadvantages can be mitigated). Air dispersion modelling of emissions from the proposed generators (without SCR technology) was undertaken at the proposed stack heights in order to determine if SCR technology was required to achieve compliance with the EU ambient air quality standards. The results of the modelling indicated that the emissions will be

compliant with the EU ambient air quality standards at all off-site locations (including background concentrations), refer to Chapter 8. On the basis that the SCR technology was not necessary to achieve compliance with the air quality standards, it was decided not to incorporate the SCR technology within the data centre development. Whilst SCR abatement is incorporated for the energy center to ensure air quality emissions meet required air standards.

*Table 3.4 Assessment of alternative stack heights*

| Pollutant/<br>Year               | Averaging<br>Period         | Process<br>Contribution<br>NO <sub>2</sub> (µg/m <sup>3</sup> ) | Background<br>Concentration<br>(µg/m <sup>3</sup> ) | Predicted<br>Environmental<br>Concentration<br>NO <sub>2</sub> (µg/m <sup>3</sup> ) | Limit<br>Value<br>(µg/m <sup>3</sup> ) | PEC<br>as a<br>% of<br>Limit<br>Value |
|----------------------------------|-----------------------------|---|---|---|--|---------------------------------------|
| NO <sub>2</sub> / 8 m<br>stacks  | Annual mean                 | 22.7  | 14  | 36.7  | 40                                     | 92%                                   |
|                                  | 99.8th%ile of<br>1-hr Means | 111.5   | 28  | 139.5   | 200                                    | 70%                                   |
| NO <sub>2</sub> / 12<br>m stacks | Annual mean                 | 22.2  | 14  | 36.2  | 40                                     | 91%                                   |
|                                  | 99.8th%ile of<br>1-hr Means | 105.5   | 28  | 133.5   | 200                                    | 67%                                   |
| NO <sub>2</sub> / 15<br>m stacks | Annual mean                 | 21.9  | 14  | 35.9  | 40                                     | 90%                                   |
|                                  | 99.8th%ile of<br>1-hr Means | 103.2   | 28  | 131.2   | 200                                    | 66%                                   |
| NO <sub>2</sub> / 20<br>m stacks | Annual mean                 | 21.6  | 14  | 35.6  | 40                                     | 89%                                   |
|                                  | 99.8th%ile of<br>1-hr Means | 98.6  | 28  | 126.6   | 200                                    | 63%                                   |
| NO <sub>2</sub> / 25<br>m stacks | Annual mean                 | 21.2  | 14  | 35.2  | 40                                     | 88%                                   |
|                                  | 99.8th%ile of<br>1-hr Means | 92.5  | 28  | 120.5   | 200                                    | 60%                                   |
|                                  | 99.8th%ile of<br>1-hr Means | 20.8  | 14  | 34.8  | 40                                     | 87%                                   |
| NO <sub>2</sub> / 30<br>m stacks | Annual mean                 | 86.1  | 28  | 114.1   | 200                                    | 57%                                   |
|                                  | 99.8th%ile of<br>1-hr Means | 22.7  | 14  | 36.7  | 40                                     | 92%                                   |

### Water Management

It is proposed to install a rainwater harvesting system to offset water demand from the public watermains. The alternative proposal considered was that the all the water requirements for the proposed development would be met from the public watermains. While the public watermains has sufficient capacity to cater for the predicted water demand for the proposed development, the installation of the rainwater harvesting system will reduce the demand on the public watermains. The rainwater harvesting system will also reduce the volume of surface water runoff discharged to the existing storm water system. Other than potential impacts on materials assets and surface water drainage, there were no perceptible differences identified between the two options in terms of the other environmental aspects. Use of mains alone would require treated water to be used while rainwater minimises this requirement.

### Power

Both electrical power and gas-generated power were considered for the proposed development. The chosen design allows for either, or a combination of both, to be

utilised allowing for flexibility in sourcing cost effective and sustainable supplies now and in the future as growth in renewable sources become available through the Eirgrid and Gas Networks Ireland (GNI) network.

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