Environmental Impact Assessment Report

Planning Application to Clare County Council

ART DATACENTRES – ENNIS CAMPUS

Ennis, Co. Clare

Prepared by: AWN Consulting, July 2021

Prepared for: ART Data Centres Limited

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Environmental Impact Assessment Report

ART DATACENTRES – ENNIS CAMPUS

Ennis, Co. Clare

Volume 1 – Non-Technical Summary

Prepared by: AWN Consulting, July 2021

Prepared for: ART Data Centres Limited

NON-TECHNICAL SUMMARY

1.0 INTRODUCTION

This is the non-technical summary of an Environmental Impact Assessment (EIA) Report prepared by AWN Consulting (AWN) for Art Data Centres Limited (herein referred as 'the Applicant') to accompany a planning application to Clare County Council (CCC) for a data storage and energy centre facility development on lands in the townlands of Tooreen and Cahernalough, Tulla Road, Ennis, Co Clare. The location of the proposed development is shown in Figure 1.1.

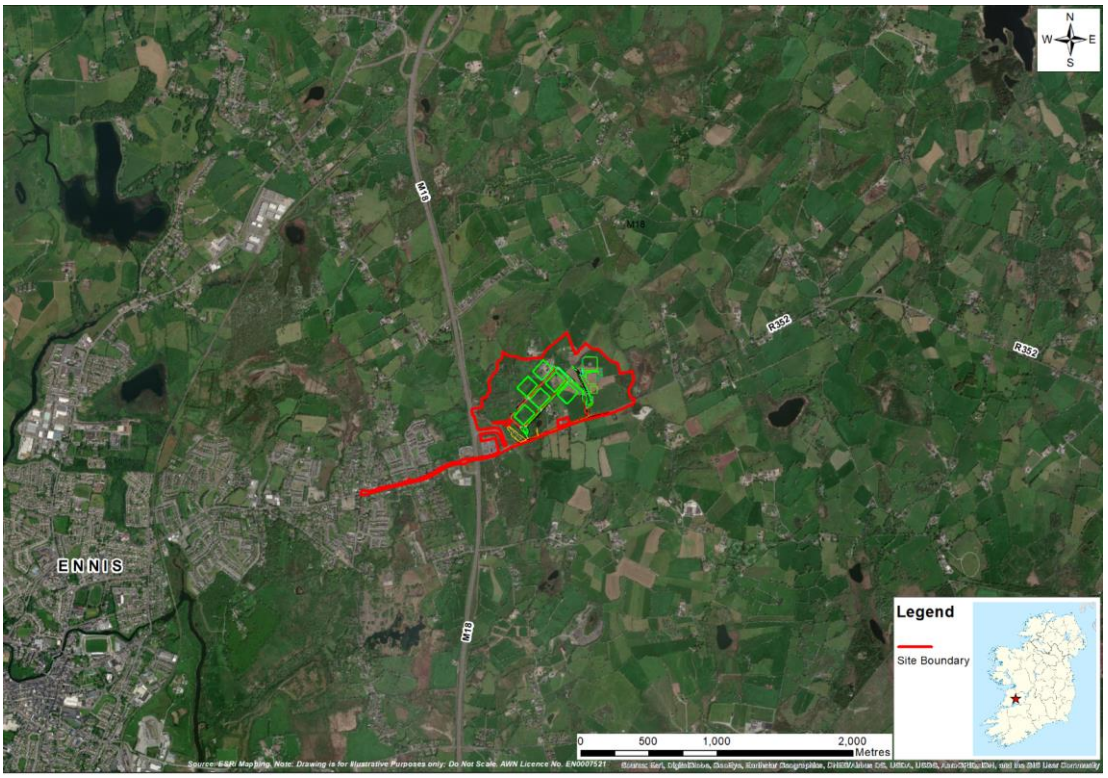


Figure 1.1 *Location of the Proposed Development*

The development footprint is approximately 60 Ha. The application is for a ten-year permission for a data storage facility campus.

The planning permission will reinforce the planning objectives of the Variation No.1 to the Clare County Council Development Plan (CCDP) 2017-2023 which states that the 55ha area 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 structure, used primarily for the storage, management and dissemination of data and the provision of associated power electricity connections and energy generating infrastructure*."

Requirement for an EIA

The requirement for EIA for certain types and scales of development is set out in the EIA Directives (2011/92/EU and 2014/52/EU), European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the bulk of which came into

operation in September 2018), the European Communities (Environmental Impact Assessment) Regulations 1989, as amended, the Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001, as amended. This EIA Report is prepared in accordance with the 2011 EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive.

The project proposed is not listed under Annex I of the EIA Directive and it is below the relevant threshold as set out in the Planning and Development Regulations 2001-2019 for Annex II projects. The threshold for "*industrial estate development projects, where the area would exceed 15 hectares"* as set out in Part 2 of Schedule 5 of the Regulations was considered to be most relevant threshold in the context of the proposed development in the subject location.

Consultation

The Applicant and the project team have consulted with the relevant departments of Clare County Council (CCC) in advance of lodgement of this application. In addition, relevant specialists in the proposed development project team have liaised with statutory bodies (including the Water Services, Roads/Transportation, National Parks and Conservation, Irish Water, Eirgrid, ESB, Bord Gais) by correspondence during the course of the EIA Report preparation.

Regulatory Control

A licence will be required for the energy centre based on the Industrial Emissions Directive 2010 and Environmental Protection Agency (EPA) Act 1992 (as Amended) IE Directive 2010/75/EU. The combustion of fuels in installations with a total rated thermal input of greater than 50MW is an IE Licence category activity under both Annex 1 of the IE Directive 2010 and the first schedule of the EPA Act 1992, as amended. *Capacity* in this context relates to the amount of fuel the generators use, not the amount of electricity they produce. The proposed data storage facility activity is not an Environmental Protection Agency (EPA) regulated activity in terms of the Industrial Emissions Directive 2010/75/EU (which replaced the IPPC directive).

In accordance with the legislation relating to the Medium Combustion Directive (EU 2015/2193), the back-up generators will be registered as required with the EPA. The proposed data storage facilities will require an EPA Greenhouse Gas (GHG) Emissions permit in accordance with the Environmental Protection Agency Act 1992, as amended.

Contributors to the EIA Report

The preparation and co-ordination of the EIA Report has been completed by AWN in conjunction with specialist subcontractors. The role and responsibility of each contributor, their qualifications and relevant experience are detailed in Chapter 1 (Introduction) of the EIA Report.

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Description of the Site

The lands are bordered to the south by the R352 (Tulla Road) and to the west by the M18. The lands are in agricultural use and are traversed by a gas pipeline and overhead powerlines connecting to the existing Ennis 110kv Substation that adjoins the western boundary. The site contains a number of existing dwellings and farm outbuildings. A number of these will be retained and some (one house and eight farm buildings) demolished as part of the proposed site redevelopment. Details on demolition are included in the demolition report provided with this planning submission and also addressed in Chapter 13 (Waste) and the Construction Environmental Management plan (CEMP).

The site gradient is quite variable but overall falls from east to west/southwest with elevation c.15 meters ordinance datum (mOD) in the West and 46 mOD in the East. The Ballymacahill River flows along the northwest and western boundary of the development. The river is also known as the Spancilhill (EPA, 2021) and converges with the River Fergus (farther to the southwest) which ultimately discharges into the Shannon Estuary. Local drainage is controlled by the regional drainage pattern and local karst environment as described in Chapters 5 and 6.

Proposed Development Description

The proposed development is presented in Figure 2 and comprises:

- Six data centre buildings,
- A gas powered energy centre and Above Ground Installation (AGI),
- Vertical farm – heat recovery use,
- A new 110kV substation, two drop down masts and underground grid connection.
- Undergrounding of two of the existing overhead 110kv circuits
- Connection and upgrade of foul sewer and mains supply extending along the existing R352.
- Associated Infrastructure; roads, attenuation pond, demolition of a single house and 8 farm buildings, etc.

Of the 60ha for the total development footprint, c. 10 ha of lands are retained as ecological buffer zones.

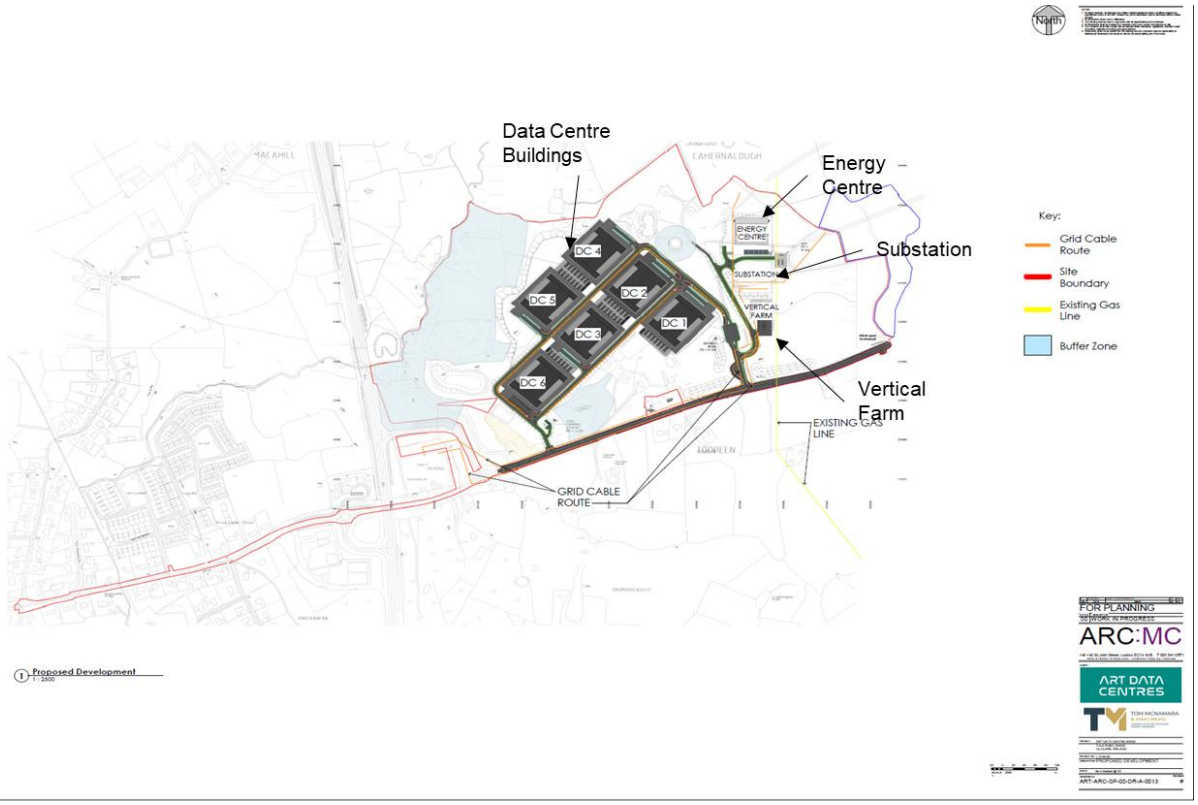


Figure 2.1 *Proposed layout. Blue line showing the ecological and archaeological buffer zones (Ref :ART-ARC-SP-00-DR-A-002).*

Sustainability, Energy Efficiency and Resource Use

The development design has incorporated significant measures to minimise impact on local biodiversity. The buildings are positioned to be outside of ecological and protected

areas with suitable buffer zones. The site will operate as a “dark site” in order to minimise light spill impacts. Although the proposed development will incur loss of existing hedgerows, the proposed landscaping design once established include for new hedgerows planting in the order of three times the current extent. The proposed landscape design will focus on enhancing local biodiversity by incorporating native species and pollinator planting. Landscaping will commence ahead of main construction works to ensure early establishment.

The design incorporates measures to reduce energy usage, promote a low carbon model and support sustainability (ref: Energy and Sustainability Statement prepared by Hurley Palmer Flatt). Measures include: recovering heat from the data halls for use in a vertical farm for growing high value plants; use of external air for cooling; use of collected rainwater for cooling during the few weeks in summer when adiabatic cooling may be required; solar panels on the roofs of data centre buildings and use of waste heat and solar gain for admin area heating and cooling systems and hot water generation.

The site is to be provided with an 80MW+ connection to the existing Ennis Eirgrid substation and this is to be supplemented by gas powered generation in the energy centre to bring the total capacity to c. 200MW. By connecting to the Eirgrid network, this provides the opportunity to use low carbon energy through wind generation and photo voltaic solar farms. Renewable sources of energy currently provided up to 40% of the total supply at any one time and this will increase significantly over the next decade as more and more renewable capacity is added to the network. The initial provision of generation on site will be based on using Natural Gas from Gas Networks Ireland (GNI). GNI have announced that they are already looking at injecting green or blue hydrogen into their network to improve their carbon impact, as per their Vision 2050 with the use of natural gas planned to reduce to 0% by 2050. The engines on-site will be specified to work on Natural Gas or Hydrogen or any mix in between in order to future proof the plant to take the opportunity to reduce the carbon impact. To minimise air quality impact, all of the gas engines will have selective catalytic reduction (SCR) fitted to their exhausts to reduce emissions to very low levels.

Sustainable urban drainage systems (SuDs) are implemented throughout the site including rainwater harvesting, permeable paving, use of swales and provision of an attenuation pond to manage stormwater run-off.

Proposed Development Phasing

A 10-year permission is sought as the commercial reality is that the overall orderly development of the site will take longer than 5 years. Subject to planning approval, construction works are due to commence in June 2023. Three phases of construction (Figure 2.2) are proposed with construction works completing by July 2029. Landscaping is proposed to commence in Oct 2022.

Figure 2.2 *Intended Construction Phasing for the proposed Masterplan (ART-ARC-SP-00-DR-A-0003).*

Existence of the Project over its LifeCycle

Section 2.5 of Chapter 2 provides a summary of each stage of the lifecycle of the development under the following headings:

- Construction;
- Commissioning;
- Operation;
- Decommissioning; and
- Description of Other Developments.

During construction the contractor will be required to operate in compliance with a construction environmental management plan (CEMP). This CEMP incorporates specific environmental and traffic mitigation measures (identified within the EIAR) to minimise impact on the local environment.

The construction population on site will be c. 600 staff with an estimated peak of 1200 staff in year 2027 due to the overlap of phases of development. Construction impacts (dust generation, noise, water discharges, traffic, management of wastes and imports) are described and assessed within relevant chapters of the EIAR.

Once the physical structures are in place, specialist contractors will be mobilised to complete the commissioning of the data storage facility and energy centre. Commissioning is expected to take approximately 4 weeks per 4MW of IT Infrastructure.

Once operational, each data storage facility will “go live” and serve data customers on an ongoing basis. The server systems and the supporting infrastructure will be monitored by site staff and faults identified and remedied as required. Staff are primarily required onsite for security, ongoing monitoring and maintenance of electrical equipment. The vertical farm which will utilise the excess warm air from the datacentres will generate c. 700 tonnes per year of products – mostly high value crops such as herbs. It is proposed

that between 400- 450 staff (and maintenance engineers) will be onsite each day when the datacentre and energy centre is fully operational. The vertical farm will have an additional c.40 staff. It is anticipated that the datacentre facility will operate on 2 no. 12 hour shift basis (7am to 7pm, 7pm to 7am). Working hours for the datacentre are expected to be 24 hours a day, 7 days a week. The farm will operate on a single shift only. Operational impacts are described and assessed within each chapter of the EIAR.

It is intended that the proposed development will have a long lifespan. Regular maintenance and upgrading of the facility over time will enable it to continue to meet future demands. Upon closure it is anticipated that the facility will be suitable for re-use or sold to a third party as would any other industrial site. All plant and equipment would simply be decommissioned, removed and recycled/disposed as appropriate.

A list of the other developments in the vicinity of the proposed development is provided in Chapter 3 (Planning and Development Context). There are no other projects which would result in a significant cumulative impact on the receiving environment when considered together with the proposed development**.**

3.0 PLANNING AND DEVELOPMENT CONTEXT

The site for the proposed development is situated within the administrative area of Clare City Council, and therefore the Planning and Development Framework with which the 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."

This chapter presents how the proposed development is in accordance with the policies and objectives of the National Spatial Strategy, Draft Regional Spatial, the Government Statement on The Role of Data Centres in Ireland's Enterprise Strategy 2018 and CCDP.

The proposed development is situated on suitably zoned lands. The zoning objective for the lands currently identified in the Ennis Settlement plan were amended from Industrial (IND1) to Enterprise (ENT3) at Tooreen and extend the Enterprise ENT3 zoning objective to 45ha, onto lands currently identified as being in the open countryside. The 55ha area 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.* 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".

Specific mitigation measures were identified from the Strategic Environmental Assessment undertaken for the Variation. Chapter 3, Table 3.1 provides a summary of where these measures are fully addressed in this EIAR application and the planning submission.

ALTERNATIVES

EIA legislation and the prevailing guidelines and best practice require that EIA Reports consider 'alternatives' for projects with regard to their environmental effects addressing:

- Do Nothing Alternative;
- Alternative project locations;
- Alternative designs/layouts;
- Alternative processes; and
- Alternative mitigation measures.

Do Nothing Alternative

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 development. The Do-Nothing scenario has been considered in each chapter of the EIA Report.

Alternative Project Locations

Alternative locations have already been considered within the SEA completed for Variation No 1 (adopted March 2019), of the Clare County 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 11 and 12). 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, 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".

Alternative Layouts

Three potential layout options (Chapter 3 Figure 3.4) were evaluated with regard to environmental considerations. There were no perceptible differences with regard to ecology, air, cultural heritage, human health and water with mitigation in place during construction. Layout 2 had a lower fill requirement than Layout 1 (chosen option) and Layout 3 had a requirement for additional soil and rock excavation which would result in a greater impact on traffic, soil and geology during construction. The additional soil removal would also have greater potential impact in terms of dust and noise generation.

During operation, all three options have similar impacts. However, Layout 3 would have the most impacts in terms of visual impact and potential for noise impact from the Tulla road. 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 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 occupy the central part of the site, avoiding pinch points and creating space for ancillary elements (construction compound, attenuation, sprinkler compound etc.).

Alternative Processes/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_2 savings achieved through the integration of passive design, energy efficiency measures and Low and Zero Carbon (LZC) technologies.

Air dispersion modelling of emissions (refer to Chapter 8) 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 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). 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 datacentre developments whilst SCR abatement is incorporated for the energy centre to confirm the flue discharge will meet air quality standards.

Following assessment of alternatives, it was decided to use a rainwater harvesting system to offset water demand from the public watermains. The rainwater harvesting system will also reduce the volume of surface water runoff discharged to the existing storm water system.

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.

Alternative Mitigation

For each aspect of the environment, each specialist has considered the existing environment, likely impacts of the proposed development and reviewed feasible mitigation measures to identify the most suitable measure appropriate to the environmental setting the project design. In making a decision on the most suitable mitigation measure the specialist has considered relevant guidance and legislation. In each case, the specialist has reviewed the possible mitigation measures available and considered the use of the mitigation in term of the likely residual impact on the environment. The four established strategies for mitigation of effects have been considered: avoidance, prevention, reduction and offsetting (not required in this

development). Mitigation measures have also been considered based on the effect on quality, duration of impact, probability and significance of effects.

Conclusion
Based on the assessment of reasonable alternatives (in relation to location, layout, design, technology, mitigation) relevant to the proposed development and its specific characteristics as set out in this chapter, the selected site is considered to be a suitable location for the proposed development from both an environmental perspective and a planning perspective.

4.0 HUMAN HEALTH AND POPULATION

This chapter evaluates the impacts of the proposed development on population and human health. In accordance with the Draft EPA EIA Report Guidance (2017), this chapter has considered the *"existence, activities and health of people"* with respect to *"topics which are manifested in the environment such as employment and housing areas, amenities, extended infrastructure or resource utilisation and associated emissions"*.

The area is primarily rural with a number of individual residents located along the surrounding roadways. The M18 Motorway is located to the west of the site. Ennis town is located to the west. Agricultural land to the north, south and east are representative of the typical rural landscape in the area. In terms of landscape amenity of the proposed development site, there are no listed or scenic views, or tree preservation orders pertaining to the site, and no protected structures. The site is located within the 'Working Landscape' designation of the Clare County Development Plan 2017–2023 and outside of the 'Heritage Landscapes' designation.

Impact Assessment
It is predicted that there will be a *slight positive* impact on local business activity, the economy and employment of the local and wider area. during the construction and operation phases with the increased presence of construction workers and employees using local facilities. It is also anticipated that the proposed development will have indirect positive effects on employment in terms of construction material manufacture, maintenance contracts, equipment supply, landscaping etc. The completed development will also have a *long term slight positive* impact in the provision of employment and additional capacity in cloud computing and data storage, the demand for which remains high.

Human health impacts during construction and operation in terms of air quality and climate, noise and vibration and traffic are assessed in Chapters 8, 9 and 12 of the EIA Report, respectively. With mitigation in place, there is a *short term imperceptible* impact for dust impacts during construction. Air dispersion modelling undertaken with reference to EU ambient air quality standards which are based on the protection of human health confirm that the impact of the operation phase of the Proposed Development is likely to be *long-term* and *imperceptible* with respect to human health (see Chapter 8).

During construction, noise impact (Chapter 9) is assessed to *be short-term, slight to moderate* significance considering the existing background low level of noise in this rural location. As demonstrated by the noise modelling results, the predicted noise emissions during the operational phases are within the relevant noise criteria considered suitable for the development considering the guidance outlined in EPA: *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016)*. These guidelines consider impacts on human health. As such the modelling has due consideration to human health, and has shown that although there

will be an increase in noise as a result of the operation of the facility, this is not considered to have a significant impact on human health. The proposed development will not generate any perceptible levels of vibration during operation and therefore there will be no impact from vibrations on human health.

The traffic assessment (Chapter 12) shows that the existing public road network is currently operating well. There is capacity on the road network for the additional traffic movements during construction and the operational phase. The traffic assessment shows that the additional traffic movements associated with the proposed development were found to be *short-term, negative* and *slight* for the construction phase and *long-term, negative* and *slight* for the operational phase

The Landscape and Visual Impact Assessment (LVIA), Chapter 10 of this EIAR, did not identify any significant impacts upon the landscape or visual receptors as a result of the proposed development. The buildings have been located within the landform in such a way as to minimise as far as possible any potential visual impact. Potential visual impacts have been further minimised by proposed berms and large extents of structure planting which will largely contain views of the proposed buildings to the area within the site.

5.0 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

The lands for the proposed development are agricultural with no history or evidence of any other previous use.

The subsoils in the area of the proposed development site indicates four principal soil types; limestone and sandstone till, karstified bedrock (outcrop or subcrop) and Fen Peat. The underlying bedrock is a Regionally Important Limestone Aquifer (Rkc) which indicates that the aquifer bedrock is dominated by karst environment with conduit flow.

Drainage within the site boundary comprises a feature lake (Toureen Lough), a number of ponds, swallow holes and spring discharges, which discharge to the Ballymacahill River. Local drainage at the proposed development site is typical of a karst environment. Geophysics and drilling has confirmed that karstification is more dominant in the west of the site. This can be identified on the ground by the presence of a number of springs and swallow holes. Elsewhere the bedrock was found to be quite competent.

Site investigations (GII, 2021) indicate bedrock depth is highly varied throughout the site. Aquifer vulnerability (based on soil cover thickness and type) is described as generally ‘Extreme’ at the western section and ‘High’ to ‘Moderate’ throughout the rest of the site expect for localised topographic highs where rock head is close to the surface. Section 5.3.18 in Chapter 5 of the EIA Report presents the conceptual site model (CSM) for the site based on desk study, site investigations (including borehole drilling trial pitting, geophysics, water level measurement and water quality analysis) and interpretation by a hydrogeologist.

The Groundwater Body (GWB) underlying the site is the Ennis GWB. Currently, the most recent WFD groundwater status for this water body (2013-2018) is ‘Good’ with a current WFD risk score ‘Under Review’.

Based on the TII (previously NRA) methodology (2009),criteria for rating site importance of geological features, the importance of the bedrock and soil features at this site is rated as *‘Medium Importance’* with medium significance or value on a local scale. Based on the TII methodology) the importance of the hydrogeological features at this site is rated as ‘*Very High Importance’* based on the assessment that the attribute has a high-quality significance or value on a local scale. In addition, there is direct hydrogeological connection between the aquifer to the Ballymacahill River which has a hydrological connection with the Lower Shannon River protected sites (SAC).

The project engineers have estimated that c. 105,703 m^3 of material will require excavation for the proposed development. The majority of this material will be reused on site as part of the site levelling and landscaping works. Representative sampling has confirmed no evidence of soil or water contamination on the site. However, it is expected that some soil (along the road for the foul sewer laying) and within farm yards that are being demolished may require further sampling and licenced disposal. Import of c. 101,432 m^3 of engineering fill will be required.

The project design includes specific design measures for protection of the land soils geology and hydrogeology which include: bunding of all bulk fuel tanks within service yards, discharge of drainage from these yards through an interceptor, all drains in and surrounding the yards are to be fully contained, discharge from hard stand areas is to a fully lined attenuation pond with interceptor, discharge of the significant area outside of the hardstand area will be direct to ground as current. During construction, the contractor will be required to operate in compliance with a Construction Environmental Management Plan (CEMP) which includes a Surface Water Management Plan. Measures include, management of silt laden run-off, management of fuel storage, management of alkaline run-off from cement works, protection of ecological buffer areas and protection of karst flow paths. The design of foundations for the data centres gas. The building foundations will be a combination of pad and piled foundations. The subsurface design is based on the nature of the soils and geology identified in the site investigation undertaken in May-June 2021(ref: CSM -Figures 5.16- 5.21). In areas where karst conduits were interpreted beneath buildings, the design of the piling methodology including pile depths/ spacing will allow bridging of the existing karst conduits i.e. ensuring no change to the existing groundwater flow regime across the site.

Following implementation of mitigation measures, the predicted impact during construction of the proposed development has been determined as *short-term*, *imperceptible* and *neutral.*

During the operational phase, there are limited activities that could potentially impact on the land soils, geological and hydrogeological environment. There are no discharges to ground and run-off from service areas is through designed drainage infrastructure which includes petrol interceptors and an attenuation pond. The predicted impact during operation of the proposed development, following implementation of design and mitigation measures will be *long-term*, *imperceptible* and *neutral.*

6.0 HYDROLOGY

This chapter assesses and evaluates the potential impacts of the proposed development on the local hydrology. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

The development site is located within the River Fergus Sub Catchment and the Spancelhill River sub basin catchment. The Lower Shannon River Special Area of Conservation (SAC) is located approx. 2.1 km downgradient (south-west) of the proposed development site. The local drainage is described in section 5 above.

As there is a direct hydrological connection between the site and Lower Shannon River protected sites (SAC), the overall hydrological attribute significance is considered to be “High” to “Very High” following TII (previously NRA) methodology (2009). However, it is noted that based on the likely impacts (even without mitigation) and distance to the SAC, there is no potential for impact on the water quality in the Lower Shannon River protected sites (SAC) during construction or operation.

Mitigation measures to protect water quality during construction are included in the Construction Environmental Management Plan (CEMP) and a specific Surface Water Management Plan (SWMP) for the proposed development. Mitigation measures include management of soil storage, treatment of run-off, containment of oil for refuelling works within the contractors compound area and monitoring prior to any discharges off site. The implementation of these mitigation measures will ensure that the potential impacts on the surface water environment do not occur during the construction phase and that the residual impact will be *short-term, imperceptible and neutral.*

During operation there are limited risks to surface water receptors. The development includes the storage of oil for emergency generators and diesel fuel belly-tanks for each data hall. However, all fuel stores are fully bunded and in areas of hardstand with any accidental discharge treated by oil interceptors prior to reaching the attenuation pond upgradient of the river. Attenuation has been designed on site for the 1:100-year flood event including consideration of a 20% allowance for climate change effects. An overflow subsurface pipeline will discharge at current discharge rates (greenfield) to the Ballymacahill River. Drainage will be from a single lined fully designed attenuation pond feature (volume of 9,293 m^3) to be located to the southwest of the site. A Class (I) by-pass separator with a suitable capacity will be installed downstream of the proposed hydrobrake unit. The function of the separator is to intercept pollutants (any petroleum/ oil) and prevent their entry to the Ballymacahill River. Rainwater run-off from the roofs of the six data centres will be collected and will feed water harvesting tanks with any excess overflow into the common road drainage network. This water will be available as cooling water. Other SuDS measures will include permeable paving and swales. As such, there is no potential for increase either flooding or impact on water quality as a result of the proposed development. During operation, the site will also be required to operate in compliance with the requirements of an Irish Water (IW) licence for discharge to sewer. Based on the design and mitigation measures planned, the predicted impact on the receiving water environment is determined to be *long-term, imperceptible and neutral.*

7.0 BIODIVERSITY

This chapter considered the potential direct, indirect and cumulative impacts on biodiversity within the zone of influence of the proposed development. The assessment was undertaken in line with a number of guidance documents including the *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018 as updated September 2019).

The desktop study involved collection and review of relevant published and unpublished sources of data, collation of existing information on the ecological environment and consultation with relevant statutory bodies (e.g. National Parks & Wildlife Service (NPWS) and Vincent Wildlife Trust (VWT)).

A comprehensive range of field surveys were carried out between June 2020 and April 2021 to inform the impact assessment[1]. These included;

- habitat and flora surveys;
- otter surveys;
- badger surveys;
- bat surveys;
- other mammal surveys (including pine marten/red squirrel surveys);

[1] Field surveys were also undertaken in 2018. The results from these surveys are used to compare how the site has changed/unchanged since 2018, and are not used to inform the impact assessment.

- breeding and wintering bird surveys (including dedicated hen harrier vantage point surveys);
- reptile habitat surveys; and
- amphibian habitat surveys.

The following key ecological receptors were identified within or occurring within the zone of influence of the proposed development site;

- a range of habitats valued as being from local high to international importance, including Annex I habitats;
- mammals, including; bats (lesser horseshoe bat – a Qualifying Interest species for Special Areas of Conservation in the vicinity), otter (a Qualifying Interest species for Special Areas of Conservation in the vicinity), badger, pine marten, red squirrel, Irish hare, pygmy shrew, and Irish stoat;
- amphibians;
- reptiles;
- fish (including Qualifying Interest species, salmon and lamprey, for a Special Area of Conservation in the vicinity);
- invertebrates;
- white-clawed crayfish; and
- breeding and wintering birds (including Special Conservation Interest species for Special Protection Areas in the vicinity).

In addition, European and nationally designated sites were identified as key ecological receptors. The proposed development site does not overlap with any European or nationally designated sites. However, a hydrological pathway exists between the Spancelhill Stream and European and national sites downstream, and the proposed development is utilised by a number of Qualifying Interest and Special Conservation Interest species from nearby European sites. Due to this hydrological connection, and as the conservation objectives of these designated sites could be compromised as a result of the proposed development (in the absence of mitigation), a Natura Impact Statement has been prepared as part of this planning application. This NIS will inform and assist the competent authority, Clare County Council, in carrying out its Appropriate Assessment as to whether or not the proposed development will adversely affect the integrity of any European sites, either alone or in combination with other plans and projects.

The Spancelhill Stream flows along the north western border of the site, before exiting the site through a culvert under the M18 Motorway to Ennis. Spancelhill Stream then flows c. 2.1km downstream until it reaches the River Fergus, which then ultimately discharges into the Fergus Estuary c. 4.9km downstream. The River Fergus overlaps with the Lower River Shannon SAC where the Spancelhill Stream joins the River Fergus, and the Fergus Estuary overlaps with the River Shannon and River Fergus Estuaries SPA and the Fergus Estuary and Inner Shannon, North Shore pNHA c. 4.9km downstream. During construction or operation, contaminated surface waters or a change in the water regime could potentially be transferred to downstream European and national sites via this connection, and subsequently effect the QI species and habitats designated as part of these European and national sites. A distant hydrological connection also exists via the Spancelhill Stream and the River Fergus with Dromore Woods and Loughs SAC, located c. 4.4km north of the proposed development. This site is upstream of the development; however otter and lesser horseshoe bats are Qualifying Interest species of this site, both of which are mobile species and present within the proposed development, and therefore the proposed development has the potential to effect the conservation objectives of this European site (in the absence of mitigation).

Similarly, Old Domestic Building (Keevagh) SAC located c. 4.3km south east and Old Domestic Buildings, Rylane SAC located c. 5.9km north east of the proposed development, is designated for populations of lesser horseshoe bat. As this species uses the proposed development for foraging and/or commuting, the proposed development has the potential to affect the conservation objectives of these European sites, prior to mitigation.

The proposed development is also used as an *ex-situ* feeding site for a number of SCI bird species. Birds identified during surveys include; coot, mallard, gadwall, teal, and black-headed gull. All of the aforementioned species, apart from black-headed gull, are SCI species of Ballyallia Lough SPA c. 2.7km north west of the site. Black-headed gull and teal, are both SCI species for the River Shannon and River Fergus Estuaries SPA, located c. 5.1km south west of the site. Teal is also an SCI species for the River Shannon and River Fergus Estuaries SPA and Corofin Wetlands SPA, c. 10.7km north west of the site. Hen harrier surveys were carried out within the proposed development site, whilst no individuals were recorded, hen harrier is a Special Conservation Interest species for the Slieve Aughty Mountains SPA, located c. 4.5km north west of the proposed development, and was therefore included in the assessment of potential effects within the NIS.

Potential impacts arising from the proposed development during the construction phase are considered to be; habitat loss and fragmentation, habitat degradation/effects on QI/SCI species as a result of hydrological impacts, habitat degradation as a result of hydrogeological impacts, habitat degradation as a result of air quality impacts, habitat degradation as a result of introducing/spreading non-native invasive species, disturbance and displacement impacts; and direct injury/mortality. Potential impacts arising from the proposed development during the operational phase are considered to be: surface water run-off of sediment and/or pollutants, habitat degradation as a result of air quality impacts, disturbance and displacement of fauna species, and artificial lighting impacts.

As part of the mitigation strategy, the proposed landscape plan has been developed in order to retain as much of the existing landscape as possible, and where this is not possible, extensive compensatory planting of native hedgerows and woodland planting is proposed. Diverse native meadow mix planting and management and enhancement of existing meadows is also proposed which will benefit the overall biodiversity of the proposed development site. The inclusion of an already constructed attenuation pond and the proposed addition of an additional SuDS basin and swale incorporated into the design will greatly reduce the impact the proposed development will have on the Spancelhill Stream and local receiving environment. A Landscape and Biodiversity Management Plan has been produced as part of this planning application *'to provide landscape, visual and environmental screening and enhancement measures through planting and design'* (Clare County Council, 2019). This plan will provide a practical and comprehensive guide that can be referred to and consulted by the local authority, the developer, and their appointed contractors, and the future operator of the Data Centres.

A comprehensive suite of mitigation measures has been proposed, in addition to considerations included within the design of the proposed development *i.e* surface water protection controls, avoidance of bat roosts within the design, lighting designed specifically to avoid disturbance/displacement of sensitive receptors (bats, nocturnal mammals, birds), and avoidance of buffer zones and areas of sensitive habitats (Annex I habitat). All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect biodiversity and the receiving environment. Considering the elements included within the design of the proposed development, and the implementation of the mitigation measures in the associated planning application documents to avoid or minimise the effects of the proposed

development on the receiving environment, no significant residual effects on biodiversity are predicted as per the CIEEM guidance.

8.0 AIR QUALITY AND CLIMATE

This chapter of the EIA Report evaluates the impacts which the proposed development may have on air quality and climate. In terms of the existing air quality environment, baseline data and data available from similar environments indicates that levels of nitrogen dioxide, carbon monoxide, particulate matter less than 10 microns and less than 2.5 microns are generally well below the National and European Union (EU) ambient air quality standards.

The existing climate baseline can be determined by reference to data from the EPA on Ireland's total greenhouse gas (GHG) emissions and compliance with European Union's Effort Sharing Decision "EU 2020 Strategy" (Decision 406/2009/EC). Data from the EPA in 2020 indicates that Ireland had total GHG emissions for 2018 of 60.93 million tonnes carbon dioxide equivalent (Mt CO_2eq). This is 5.59 Mt higher than Ireland's emission ceiling for 2018 as set under the EU's Effort Sharing Decision (ESD), 406/2009/EC. Emissions are predicted to continue to exceed the targets in future years.

Air Quality

During the construction phase there is the potential for dust emissions to impact nearby sensitive receptors resulting in potential dust soiling and human health impacts. Best practice mitigation measures have been proposed for the construction phase of the proposed development in order to mitigate potential dust impacts. Provided the mitigation measures outlined within Chapter 8 are implemented construction dust impacts will be short-term, negative, localised and not significant to nearby sensitive receptors.

Air dispersion modelling of operational phase emissions from the proposed development was carried out using the United States Environmental Protection Agency's regulatory model AERMOD. The aim of the study was to assess the contribution of operational emissions of NO_2 from the proposed development to off-site levels of this pollutant. Both the methodologies of the USEPA and UK Environment Agency were included within the assessment as per guidance issued by the Irish EPA.

<u>USEPA Methodology</u>

The modelling assessment has found that ambient NO_2 concentrations as a result of the continuous operation and schedules testing of the energy centre gas engines and of the emergency operations and scheduled testing of the data centre back-up diesel generators are in compliance with the relevant ambient air quality limit values at all locations at or beyond the site boundary.

For the proposed development (Worst-Case) Scenario, worst-case emissions from the site assuming continuous operation of the energy centre gas engines, scheduled monthly testing of the engines and the data centre back-up generators as well as emergency operation of the back-up generators for 100 hours per year will lead to an ambient NO_2 concentration (including background) which is 72% of the maximum ambient 1-hour limit value (measured as a 99.8th%ile) and 92% of the annual limit value at the worst-case location at or beyond the site boundary. The impacts to air quality from operation of the proposed development are therefore deemed long-term, slight, localised and negative.

For the proposed development (Likely Average Operation) Scenario, worst-case emissions from the site assuming continuous operation of the energy centre gas engines, scheduled monthly testing of the engines and the data centre back-up generators as well as emergency operation of the back-up generators for 100 hours per year will lead to an

ambient NO_2 concentration (including background) which is 72% of the maximum ambient 1-hour limit value (measured as a 99.8th%ile) and 86% of the annual limit value at the worst-case location at or beyond the site boundary. The impacts to air quality from operation of the proposed development on human health are therefore deemed long-term, slight, localised and negative.

UK EA Methodology

The results for the Proposed Development (Worst-Case) Scenario indicate that in the worst -case year, the standby generators can operate for up to 99 hours per year before there is a likelihood of an exceedance of the ambient air quality standard (at a 98th percentile confidence level). However, the UK guidance recommends that there should be no running time restrictions placed on these generators which (aside from testing) are only used to provide power on site only during an emergency scenario.

Climate

Based on the scale and temporary nature of the construction works, the potential impact on climate change and transboundary pollution from the construction of the proposed development is deemed to be short-term and not significant in relation to Ireland's obligations under the EU 2030 target.

No significant on-site CO_2 emissions will occur as a result of the proposed development. During normal operations electricity to power the site will be sourced from the energy centre. Whilst the use of electricity for the proposed development would result in emissions of approximately 657,000 tonnes CO_2eq per annum the overall impact to climate is deemed indirect, negative, long-term and slight.

Human Health

The dust mitigation measures as outlined in the CEMP that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is short-term and imperceptible with respect to human health.

As demonstrated by the dispersion modelling results, pollutant concentrations with the proposed development operational are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health.

Sensitive Ecosystems

The dust mitigation measures as outlined in the CEMP that will be put in place during construction of the proposed development will ensure that the impact is likely to be short-term and imperceptible with respect to the protection of sensitive habitats and plants.

As demonstrated by the dispersion modelling results, pollutant concentrations with the proposed development operational are compliant with all National and EU ambient air quality limit values at nationally and internationally designated ecological sites and, therefore, will not result in a significant impact on sensitive habitats. Thus, the impact to air quality from operation of the proposed development on designated habitat sites is therefore deemed long-term, imperceptible, localised and negative.

In addition, all onsite sensitive habitats are in compliance with the appropriate N critical loads based on worst-case operational assumptions.

9.0 NOISE AND VIBRATION

This chapter assesses the anticipated noise and vibration impact associated with the proposed development at nearby noise sensitive locations.

The existing noise climate has been surveyed at nearby noise sensitive receptors over the course of typical day and night-time periods. Road traffic movements, both distant and local, were noted as the most significant source of noise during both daytime, evening and night-time periods. Other noise sources included other typical noise sources expected in a semi-urban environment (e.g. pedestrian activity, dogs barking, distant agricultural noise etc.)

When considering a development of this nature, the potential noise and vibration impact on the surroundings must be considered for each of two distinct stages: the short-term impact of the construction phase and the longer-term impact of the operational phase.

During the construction phase of the proposed development there will be some impact on nearby noise sensitive properties due to noise emissions from site activity and traffic. The application of noise limits and limits on the hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum. The resultant impact is *moderate*, *negative and short-term*.

The primary sources of noise during the operational phase of the proposed development will be long-term and include the introduction of additional building services plant for general site operation, additional building services plant (i.e. generators) for emergency site operation and the introduction of additional vehicular traffic on existing public roads. Proprietary noise and vibration control measures will be employed in order to ensure that emissions from building services plant do not exceed the relevant criteria at nearby noise sensitive locations. Any change in noise levels associated with additional vehicles at road junctions in the vicinity of the proposed development is expected to be imperceptible. The resultant noise impact is *moderate negative* and *long-term* while being within all adopted noise criteria.

No significant sources of vibration will be present during the operational phase. There are therefore no predicted vibration impacts at neighbouring dwellings during the operational phase. The resultant vibration impact is *imperceptible*, *neutral* and *long-term*.

10.0 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

A series of design measures, which were inherent to the design of the proposal, have ensured that the proposal fits with the surrounding character and context. The LVIA takes cognisance not only of the proposed built development, but also of the proposed landscaping.

The six data centre buildings have been located centrally to the site in order to reduce visibility from the Tulla road and the residences located there. As such, the buildings are located in the generally lower elevations of the site. They have also been orientated to correspond with the overall slope of the landform from east to west. This ensures that the key undulating characteristic and overall landform is maintained in views from the wider landscape. The buildings have been carefully situated to avoid ecological and archaeological buffer zones around the site. This siting also ensures the peripheral vegetation is retained. All the existing waterbodies have also been retained. The building

elevational treatments consist of architectural metallic wall panels that graduate from dark blue to light blue as the façade rises. This pattern helps to lose the building into the sky, reducing the massing of the building.

The ancillary buildings of the Energy Centre, Substation and Vertical Farm are located in the east of the site at the base of the larger hill, from which the ground level increases significantly. This siting ensures that there will be no potential for views of these buildings from the east and limits the visual impact on views of the horizon from the north and west.

The proposed woodland planting along the boundary to the R352, Tulla Road screens the proposed development from the adjacent properties and the road users. The woodland planting elsewhere across the site also aid in reducing actual visibility of the proposed development and provides an attractive setting to the development. The woodlands also enhance the biodiversity of the site. The proposed meadow grasslands across the site provide a landscaped area of transition between the proposed building layout and the surrounding countryside and pastoral farmland.

The LVIA, by reference to field surveys and viewpoint analysis, has identified that the site is relatively visually discrete from the wider landscape despite its large scale. Views of the proposed development are not available from the east due to the existing topography. Views of the proposal from the R352 and the wider landscape to the south are contained by a combination of the existing and proposed woodland planting in the south of the site.

Viewpoint A from the east (Appendix 10.1) demonstrates the restricted visibility of the proposal due to the existing topography. Viewpoints 5 and 6 (Annex 10.1, Figures 10.15a to 10.16b), along with Viewpoints C to G (Appendix 10.1), also demonstrate the restricted visibility in views from the west. As evidenced by these views, the landscape and visual effects will largely be *longterm negative* resulting in *not significant* to *slight significance.*

To the north, although the built form will be visible, Viewpoint 4 (Annex 10.1, Figures 10.14a & b) demonstrates how the combination of the proposed bunds and woodland planting will reduce the visible extents of the visible. This viewpoint demonstrates the worst-case scenario for potential visibility of the proposed development in the wider landscape. The visual effect is assessed to be *longterm, negative* with a *moderate* significance.

During construction visibility will mainly be limited to the construction cranes and the emerging buildings. The initial groundworks to form the bunds and the early woodland planting will for the most part screen all ground levels construction works from view.

As a result of the landscape and visual impact assessment, it is considered that the site has the landscape capacity to accommodate the proposed development, taking account of the existing and proposed landscape framework and the following reasons:

- The LVIA has identified that there will be no ‘Significant’ or higher impacts on the landscape and visual receptors as a result of the proposed development;
- The proposal is in keeping with the zoning and designation in Variation No.1 to the Clare County Development Plan 2017-2023;
- The proposal responds to the existing landscape context and landform, ensuring that the woodland designated as ‘Buffer Space’ on Clare County Council's Zoning Map PLP-18-0001-2 (12/03/2019), Tooreen Lough and the ring fort Recorded Monument are not altered as part of the development; and

- The proposal improves and increases the habitats and biodiversity through the addition of the bunds, the additional woodland and the new meadow grasslands.

The adoption of the design measures (described in this report, the Landscape Design Strategy report and the Landscape and Biodiversity Management Plan) will integrate the proposal into the surrounding context. This is evidenced by the absence of any significant landscape and visual impacts, the limited extents of potential visibility and the broader findings of the LVIA.

The lands are zoned in the Variation to the County Development Plan for development as proposed and the proposals provide for an appropriate and high-quality response to the permitted land use.

11.0 ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

This chapter assess the potential impacts, if any, on the archaeological, architectural and cultural heritage resource. The proposed development is located within 23 fields bordered to the west by the M18 and to the south by the R352. There are seven recorded archaeological sites within 250m of the proposed development, one of which, a cashel (RMP CL034-007) is situated within the northern portion of the site. Of the seven sites, five represent recorded monuments, whereas two are included in the SMR only as records of previous archaeological investigations. SMRs are not subject to statutory protection.

There are no buildings included on the Record of Protected Structures for Clare or the NIAH Building Survey in or within 250m of the proposed development area. Similarly, no Architectural Conservation Areas are located within the study area. One demesne landscape has been identified within the study area, which comprises Tooreen House, located to the immediate south.

A review of the aerial photographic coverage and historic mapping, along with the field inspection, has resulted in the identification of a number of Cultural Heritage Sites and Areas of Archaeological Potential. CH 1-4 comprise the site of vernacular structures and the site of a lime kiln, all of which are marked within the historic mapping. Today only CH 1 and 2 possess upstanding remains. AAPs 1-5 relate to small loughs/ponds within the area (which are a characteristic of drumlin landscapes) along with a stream in the western part of the site, which follows the path of the townland boundary between Toureen and Cathernalough. A large portion of this townland boundary is located within the proposed development area, but much of it is defined by a denuded stone wall and mature trees. No other features or structures of archaeological, architectural or cultural heritage significance were identified.

Ringfort CL034-007 will be preserved in-situ as part of the development with any potential direct impacts screened out as part of the design process. Works associated with the access roads will impinge within c. 27m of the ringfort, but the site will not be directly impacted by construction activities.

AAPs 1-5 will not be affected by the construction of the proposed development. Similarly, CH 1, 2 and 4 remain outside of the footprint of the proposed works. CH 3 (site of lime kiln) will be subject to a direct, negative impact. Assuming buried remains survive beneath the current ground level, the impact (prior to mitigation) may be significant in nature.

Although no other previously unrecorded sites of archaeological, architectural and cultural heritage significance were identified during the assessment, it remains possible that previously unrecorded archaeological remains survive beneath the current ground level with no surface expression. Prior to the application of mitigation, it is possible that

construction activities may result in a direct negative impact on same. Impacts may vary in scale from moderate to profound.

The construction of the proposed development will result in the removal of a section of townland boundary in between Toureen and Cathernaboy. Prior to the application of mitigation, this represents a direct negative moderative impact upon the cultural heritage resource.

A full geophysical survey and programme of archaeological testing will be carried out prior to the commencement of construction. The works will be carried out under licence to the Department of Housing, Local Government and Heritage. This work will be carried out in order to identify any remains associated with CH 3, along with any buried archaeological remains within the landscape that may be affected by the proposed development. Further mitigation may be required, dependant on the results of the assessment, such as preservation in-situ/by record and/or archaeological monitoring. Any further mitigation will require the approval of the National Monuments Service of the Department of Housing, Local Government and Heritage.

A full written and photographic record will be made of the section of townland boundary to be impacted upon by the development. This will be carried out at the same time as the archaeological testing assessment.

Whilst the recorded ringfort (CL034-007) will be preserved in-situ, the operation of the proposed development will result in an indirect negative impact on the setting of the monument, due to the proximity of the data centre and distribution roads. The impact is moderate negative. A full photographic record of the landscape setting of ringfort CL043-007 will be made prior to the commencement of construction.

No other impacts have been identified during the operation of the proposed development, which relate to the archaeological, architectural or cultural heritage resource.

Following the completion of mitigation measures, there will be no predicted impacts on the archaeological, architectural and cultural heritage resource as a result of the construction of the development.

Following the completion of mitigation measures, there will be a slight negative indirect impact on ringfort CL034-007, due to the proximity of the operating development.

Following the completion of the mitigation measures described in this chapter, there will be no significant negative residual impacts upon the archaeological, architectural or cultural heritage resource.

12.0 TRAFFIC AND TRANSPORTATION

This chapter assesses the traffic impact of the proposed development for both the construction and operational stages of the development. The assessment considers the impacts that the traffic generated by the proposed development would have on the local highway network.

Study Area & delivery routes

The site is located approximately 4.5 kms to the east of Ennis Town Centre and is accessed from the Regional R352 Tulla Road, which is a key commuter route, radiating from the town.

Just to the west of the site the M18 motorway travels north to south under-passing the Tulla R352 Road approximately 1 km west of the proposed Art Data Centre access junction. Access to and from the M18 is provided from the R352 Tulla Road via 2 roundabouts (East Clare Roundabout the Tulla Road West Roundabout). These roundabouts together with the M18 and the proposed access junction on the R352 Tulla Road comprise the study area for the detailed traffic impact assessment.

Three local quarries have been identified for the supply of sand, stone and cement, while assumptions were made for the origins of other construction materials. It is anticipated that the vast majority of construction traffic is forecast to travel to and from the site via the M18 followed by the Tulla Road.

Estimates of trip patterns for employees were made based on traffic pattern observed on the study network, with Ennis forecast to provide a significant proportion of employees for the Art Data Centre when operational.

Traffic impact on local network

Construction phase

It is estimated that the Art Data Centre will be constructed over a 6.5 year period (80 months), commencing in December 2022, with construction forecast to be complete in July 2029. During this period it is estimated that up to 53,396 deliveries will be made to the site, with a maximum of 115 made in any one day, with a daily average of 32 daily trips forecast.

At any one time it is estimated that up to 800 daily car trips will be generated by construction staff, with an average of approximately 400 forecast for the duration of the construction period. While these trip rates were adopted for the purpose of the assessment, it is intended that a significant proportion of construction staff will travel to the site by buses provided by the contractor, which will form one element of a construction traffic management plan, aimed at minimising traffic impacts during construction.

It is forecast that the traffic impacts on the surrounding road network during the 6.5 year construction phase will be *short term, negative and slight* in nature.

Operational phase

It is proposed that the Art Data Centre will be constructed in 3 phases, with each phase becoming operational on completion, with staff, visitors and deliveries traveling to and from the site. With staff working shifts throughout the 24-hour period, it is forecast that a maximum of 256 staff will be on site at any one time.

While a Staff Travel Plan will be in place to maximise the use of sustainable travel modes a worst case scenario of all staff travelling by car was assumed for the purpose of the traffic impact assessment.

When fully operational it is forecast that 32 HGVs will visit the site per day.

It is forecast that the traffic impacts of the Art Data Centre on the surrounding road network once fully operational will be *longterm, negative and slight* in nature.

13.0 MATERIAL ASSETS

This chapter assesses ownership and access, built services and infrastructure, which have not already been addressed elsewhere in this EIA Report.

Ownership and Access
There currently exists an agreement between the Applicant and the owner of the site. A letter of consent, to apply for development on the lands from the site owner, is included with the planning application.

The main access to the proposed development site will be off the Tulla Road along the southern boundary, with a secondary. access and egress for emergency use only off the Tulla road to the west of the main entrance.

Power and Electrical Supply
During construction, the power requirements will be relatively minor. It is proposed that a temporary power supply be established for the construction phase until a permanent supply is available. During full operation, the six data storage facilities will require up to 200 MW IT load. It is envisaged that phase 1 (80MW) will be provided by electrical power from the grid. The additional phases (120 MW) will be powered by the on -site gas powered energy centre or a combination of both. There is a high pressure gas main running north/south to the east side of the site. In conjunction with Gas Networks Ireland, a pressure reduction station (AGI) will be installed to provide delivery of gas for the generators to be located in the energy centre.

It is proposed to underground two existing overhead 110kV circuits to the Ennis substation as they come onto the site on the east side. A new substation will be created on the east site, partly for extending Eirgrids substation (the existing has no additional space) and for transforming down to 10kV / 20kV for distribution to the data centres. Dual feeders will be provided to each data centre via a set of underground ducts that will be created in the service roads.

In the event of a loss of power to the site, diesel-powered back-up generators will be activated to provide power pending restoration of mains power. Based on experience, the back-up generators will rarely be used.

Telecommunications
A variety of providers including Aurora, BT, ESB and PiPiper are available in the locality of the site and discussions are ongoing to create at least 3 fibre entries to provide resilience. The connection into the wider telecommunications network will be undertaken by a statutory telecommunications operator.

Surface Water Infrastructure
The proposed surface water drainage service to the development comprises various drainage components including attenuation to greenfield run-off rates, positive stormwater networks, attenuation systems and several Sustainable Drainage Systems (SuDS) elements. The proposed surface water drainage was designed in accordance with the SuDS Manual 2015.

Foul Drainage
A temporary trench excavation along the Tulla road will be undertaken to facilitate pipe laying for connection with the existing pumping station of Gort Na mBlath located approximately 550 m west of the main site. The wastewater ultimately discharges to Ennis North (Clonroadmore) WWTP Reg D0048.

There is no trade effluent proposed for this development. Consultation with CCC and review of the most recent Annual Environmental Report for the WWTP has confirmed that sufficient wastewater capacity is available. The designed Dry Weather Flow DWF of the development is 20.9 m^3/day. The proposed foul drainage service will incorporate

a foul pumping station and associated rising main which will also include a 24-hour emergency storage tank (in the unlikely event that the proposed foul pump malfunctions).

Water Supply
A 450 diameter mains runs along the Tulla Road and following a proposed upgrade for connection (within the existing road), has capacity to supply adequate water for the proposed development. Peak daily usage will be 48 l/s and average demand 11.2l/s (Adiabatic Cooling System) during high temperature condition) plus 1.2 l/s for domestic use. On the rare occasions that evaporative cooling is required (temperature of 27^0C) the requirement is 1,000 m^3 /day for the whole site.

The overall impact is assessed as *long-term* and *neutral, not significant impact* on land, power, water, wastewater and services.

14.0 WASTE MANAGEMENT

This chapter has been prepared to address the issues associated with waste management during the construction and operational phases of the Proposed Development.

During the construction phase, typical C&D waste materials will be generated which will be source segregated on-site into appropriate skips/containers, where practical and removed from site by suitably permitted waste contractors to authorised waste facilities. Where possible, materials will be reused on-site to minimise raw material consumption. Source segregation of waste materials will improve the re-use opportunities of recyclable materials off-site. Construction of new foundations and the installation of underground services will require the excavation of c.111,424 m^3 of material, it is anticipated that all of this excavated material will be able to be reused onsite. If any of the excavated materials are either unsuitable for use as fill, or not required for use as fill, they will be exported off site. Excavated material which is to be taken offsite will be taken for offsite reuse, recovery, recycling and/or disposal.

Demolition Phase
There will be waste materials generated from the demolition of the existing residential building, multiple farm buildings and some hardstanding areas on site, as well as from the further excavation of the building foundations. The Construction & Demolition Waste Management Plan (C&D WMP) provides an estimate of the main waste types likely to be generated during the Demolition phase of the proposed Development. These are summarised in Table 14.1.

Table 14.1 *Estimated off-site reuse, recycle and disposal rates for demolition waste.*

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	32.6	0	0.0	85	27.7	15	4.9
Concrete, Bricks, Tiles, Ceramics	184.7	30	55.4	65	120.0	5	9.2
Plasterboard	14.5	30	4.3	60	8.7	10	1.4
Asphalts	3.6	0	0.0	25	0.9	75	2.7
Metals	79.7	5	4.0	80	63.7	15	11.9
Slate	3.6	0	0.0	85	3.1	15	0.5
Timber	43.5	10	4.3	60	26.1	30	13.0

Asbestos	0.1	0	0.0	0	0.0	100	0.1
Total	**362.2**		**68.1**		**250.2**		**43.9**

Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

The C&D WMP provides an estimate of the main waste types likely to be generated during the construction phase of the Proposed Development. These are summarised in Table 14.2.

***Table 14.2**: Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	32.6	0	0.0	85	27.7	15	4.9
Timber	184.7	30	55.4	65	120.0	5	9.2
Plasterboard	14.5	30	4.3	60	8.7	10	1.4
Metals	3.6	0	0.0	25	0.9	75	2.7
Concrete	79.7	5	4.0	80	63.7	15	11.9
Other	3.6	0	0.0	85	3.1	15	0.5
Total	43.5	10	4.3	60	26.1	30	13.0

A carefully planned approach to waste management and adherence to the site-specific Construction and Demolition Waste Management Plan (Appendix 14.1) and the mitigation measures in section 14.6.1 of the Material Assets – Waste Management Chapter of the EIAR during the construction phase will ensure that the effect on the environment will be **short-term, neutral** and **imperceptible**.

Operational Phase

During the operation phase, waste will be generated from the Operator of the Development. Dedicated waste storage areas have been allocated throughout the development for the various uses and waste types. The waste storage areas have been allocated to ensure a convenient and efficient management strategy with source segregation a priority. Waste will be collected from the designated waste collection areas by permitted waste contractors and removed off-site for re-use, recycling, recovery and/or disposal.

An Operational Waste Management Plan (OWMP) will be developed prior to commencement of operations. The plan will seek to ensure the facility contributes to the targets outlined in the SR Waste Management Plan 2015 – 2021. Table 14.3 below

summarises the anticipated management strategy to be used for typical wastes to be generated at the data storage facilities.

Table 14.3 Anticipated Onsite Waste Management

Waste Type	Hazard Y/N	On-site Storage/Treatment Method (anticipated)	Method of Treatment or Disposal (offsite)
Packaging Waste	N	Segregated bins/skips	Recycle
Office Waste	N	Segregated bins/skips	Recycle
General Non-Hazardous Waste	N	Segregated bins/skips	Recovery
Empty Containers	N	Segregated bins/skips	Disposal to landfill
Canteen/Kitchen Waste	N	Segregated bins for compost, mixed recyclable and general waste	Compost food waste. Recycle mixed dry recyclable waste. Recovery of other general waste
Non-hazardous WEEE	N	Segregated bins for waste electric and electronic equipment	Recovery
Landscaping waste	N	Composting bins	Composting
Vertical Farm	N	Segregated bins/skips	Compost organic waste. Recycle mixed dry recyclable waste. Recovery of other general waste
Waste Oil	Y	Oil drum in external waste storage area	Recovery
Waste sludge from oil separator	Y	Storage tank connected to oil separator	Recovery or disposal
(Wet) Batteries	Y	Specialised container in waste storage area	Return to supplier
(Dry) Batteries	Y	Specialised container in waste storage area	Recovery

Provided the mitigation measures outlined in Chapter 14 are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be **long-term, imperceptible and neutral.**

15.0 INTERACTIONS – INTERRELATIONSHIPS BETWEEN THE ASPECTS

This chapter of the EIA Report addresses potential interactions and inter-relationships between the environmental factors discussed in the preceding chapters. This covers both the construction and operational phase of the proposed development.

The EIA Report chapters have already included and described assessments of potential interactions between aspects however this section of the assessment presents a summary and assessment of the identified interactions. The majority of interactions are neutral. The increase in employment and benefit to the local economy is considered a positive interaction between planning and population and human beings. Negative interactions include the short term impact of construction noise and traffic on human beings and biodiversity. No significant traffic delays are forecast during either construction or operation but due to increased traffic the impact on the local population will be longterm, negative and slight. The generator stacks required to meet air quality guidance will result in a permanently impact on the existing landscape. proposed development is well-sited and includes architectural and landscape proposals that will ensure the development is integrated into its setting, including the use of landscaped berms and woodland planting which will provide visual screening. Residual impact in terms of landscape amenity will be *long term*, negative and *moderate significance.*

16.0 CUMULATIVE IMPACTS

The EIA Report considers the potential cumulative impacts on the environment of the proposed development with other developments on adjoining properties and the cumulative impacts with developments in the locality (including planned and permitted developments).

The potential cumulative impacts are assessed for each environmental aspect and the predicted impact for each aspect for each scenario is described in each respective chapter of the EIA Report. With mitigation for each environmental aspect, it is predicted that there will be no significant long-term cumulative effects.

Environmental Impact Assessment Report

ART DATACENTRES – ENNIS CAMPUS

Ennis, Co. Clare

Volume 2 – EIAR Report

Prepared by: AWN Consulting, July 2021

Prepared for: ART Data Centres Limited

1.0 INTRODUCTION

1.1 PROPOSED DEVELOPMENT

This Environmental Impact Assessment (EIA) Report has been prepared on behalf of Art Data Centres Limited (herein referred as 'the Applicant') to accompany a planning application to Clare County Council (CCC) for a data storage and energy centre facility development on lands in the townlands of Tooreen and Cahernalough, Tulla Road, Ennis, Co Clare. The location of the proposed development is shown in Figure 1.1.

The development will consist of the following:

- The demolition of an existing farm dwelling house together with a number of farm outbuildings on the overall site;
- The construction of 6 No. two storey data storage facility buildings with three storey plant/office levels and associated ancillary development that will have a combined gross floor area of 118,740 sq.m. These data halls are 86 x 105 x 18m high and will consist of multi levels 9m slab to slab for the data halls and air handling units and 4.5m slab to slab for offices and ancillary plant and support. Each of the six data halls will include data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas, pump rooms plus water storage tanks and plant as well as backup (standby) generators for emergency use only (11 per building) situated along one elevation of the building. The diesel generators will have associated 8 m high flues. Each generator will also include a diesel belly tank with a single refuelling area to serve the proposed emergency generators.
- Two single storey buildings used for 20/10 kV switchgear control and ancillary (each approx. 20m x 6m x 6m height)
- A gas powered energy centre and Above Ground Installation (AGI). The energy centre will primarily comprise 18 no. lean-burn natural gas engines. Each generator will have its own flue of 25m height. The energy centre will be on a 110m x 100m plot and buildings within the compound will be 12 m high. The building will house an office and welfare facilities and associated parking.
- A two storey Vertical Farm Building. The vertical farm will be c. 50 x 50 x 12m high. It will comprise c. 60% growing space and 40% office area.
- Solar Panels and Rainwater harvesting included in the development.
- Undergrounding of two of the existing overhead 110kv circuits and ancillary development.
- Ancillary site development works, that will include attenuation ponds and the installation and connection to the underground public water supply, foul and storm water drainage network, and installation of utility ducts and cables. Other ancillary site development works will include hard and soft landscaping throughout the site, lighting, fencing, signage, central services road, security gate, 276 No. car parking spaces, and 108 no. bicycle parking spaces. The development will be enclosed with landscaping to all frontages including the retention of an ecological buffer area to the west.
- The development will be accessed from the Tulla Road (R352) with the provision of a new vehicular access road, together with an emergency access/egress road to the south west of the site.

Figure 1.1 Location of the Proposed Development

A full description of the development is provided in Chapter 2 (Description of the Proposed Development) of this EIA Report.

The data storage facility will facilitate the secure storage, and distribution of information to individuals, businesses and organisations.

The application is for a ten-year permission for a data storage facility campus. A 10-year permission is sought due to the nature of this specific development. The proposed development will respond to current and future use demands in the area. The logistics of the site and use of the buildings mean that their delivery must be programmed on a phased basis over the duration of a 10-year planning permission.

The planning permission will reinforce the planning objectives of the Variation No.1 to the CCDP 2017-2023. As described in the Variation. The 55ha area 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 structure, used primarily for the storage, management and dissemination of data and the provision of associated power electricity connections and energy generating infrastructure*."

These Local Authority ambitions have been captured and incorporated in the submitted documentation.

1.2 CONTEXT

1.2.1 Legislative Requirements

The requirement for EIA for certain types and scales of development is set out in the EIA Directives (2011/92/EU and 2014/52/EU), European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the bulk of which came into operation in September 2018), the European Communities (Environmental Impact Assessment) Regulations 1989-2006, Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001, as amended. It should be noted that this EIA Report is prepared in accordance with the 2011 EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive.

The EIA Directives list those projects for which an EIA is mandatory (Annex I) and those projects for which an EIA may be required (Annex II). With regard to Annex II projects, Member States can choose to apply thresholds or use case by case examination, or a combination of both, to assess where EIA is required. In Ireland, a combination of both has been applied.

The project proposed is not listed under Annex I of the EIA Directive and it is below the relevant threshold as set out in the Planning and Development Regulations 2001-2019 for Annex II projects. The threshold for "*industrial estate development projects, where the area would exceed 15 hectares"* as set out in Part 2 of Schedule 5 of the Regulations was considered to be the most relevant threshold in the context of the proposed development in the subject location.

XX I am wary of legal summaries in an EIAR as inevitably you will be criticised for not taking account of something – hence the deletion.

1.2.2 Format of the EIA Report

This EIA Report has been developed in accordance with the most relevant guidance, including:

- EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU)
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (Department of Housing, Planning and Local Government, 2018)
- *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017)
- *Guidance on the preparation of the Environmental Impact Assessment Report* (European Commission, 2017)
- *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015)

Using the Grouped Format Structure, the EIA Report examines each environmental aspect in a separate chapter. Each chapter generally covers the following:

- Receiving Environment;
- Characteristics of the Proposed Development;
- Potential Impacts of the Proposed Development;
- Do-Nothing Scenario;

- Remedial and Mitigation Measures;
- Predicted Impacts of the Proposed Development; and
- Cumulative Impacts of the Proposed Development.

A Non-Technical Summary of the findings of the EIA Report is provided as a separate document.

Cumulative impacts for each environmental topic are assessed in each chapter.

Interactions i.e. the interrelationship between each environmental aspect, are assessed as they occur in each chapter. The final chapter of the EIA Report, Chapter 15 shows where interactions have been identified and how they have been addressed.

1.2.3 Need for the Development

The Applicant is seeking to build a significant data storage facility development to meet growing global demand for Cloud Computing space. The digital economy is seen as key by Government and Enterprise for sustained growth from overseas investor in Ireland and there is a strong demand for more data storage facility space to meet demand in Ireland. The digital economy provides high value jobs and the location of this facility in County Clare will provide up to 1200 construction staff phased over a period of 7 years and 450-475 high quality jobs during operation. The vertical farm will provide c. 40 full time jobs.

1.3 CONSULTATION

The Applicant and the project team have liaised with the relevant departments of CCC in advance of lodgement of this application.

In addition, relevant specialists in the proposed development project team have liaised with statutory bodies (including the Water Services, Roads/Transportation, National Parks and Conservation, Irish Water, Eirgrid, ESB, Bord Gais) by correspondence during the course of the EIA Report preparation.

1.3 REGULATORY CONTROL

Industrial Emissions Directive 2010/75/EU

The Integrated Pollution Prevention and Control (IPPC) Directive was transposed into Irish law by the Protection of the Environment Act, 2003, and the Industrial Emissions Directive 2010/75/EU under the European Union (Industrial Emissions) Regulations 2013, S.I. 138 of 2013.

These Regulations primarily amend the EPA Act 1992 to introduce a system of licensable activities from both the Integrated Pollution Prevention and Control (IPPC) and Industrial Emissions (IE) directives. The First Schedule of EPA Act 1992 lists the activities that require an Industrial Emissions Licence from the EPA.

It has been concluded that the Energy Centre component of the proposed development will require an IE to operate. The proposed Energy Centre will require a licence under *Class 2.1 Combustion of fuels in installations with a total rated thermal input of 50 MW or more.*

The proposed Data Storage facility, emergency backup generators, and all other aspects of the proposed development have been reviewed against the First Schedule, and it is concluded that an IE licence is not required for these activities.

Medium Combustion Plant Directive

The European Union (Medium Combustion Plant) Regulations 2017 were signed into Irish law in December 2017. Their purpose is to limit emissions to atmosphere from boilers and other stationary combustion plants in the 1-50 Megawatt Thermal Input (MWth) range. It covers all fuel types. The Regulations transpose the Medium Combustion Plant (MCP) Directive (EU 2015/2193) which was adopted in 2015.

The stationary combustion plants on site (emergency generators) will exceed 1 MWth, and, accordingly, this plant will be registered in advance of the commissioning phase as required with the Environmental Protection Agency (EPA).

Emissions Trading Directive

The EU is committed to achieving a reduction of greenhouse gas emissions; this is being implemented by the EU Emissions Trading Directive (Directive 2003/87/EC). The EPA has been given the responsibility for implementing the Emissions Trading Directive in Ireland. The Directive establishes an allowance-trading scheme for emissions to promote reductions of greenhouse gases, in particular carbon dioxide.

The trading scheme applies to facilities with:

Combustion installations with a rated thermal input exceeding 20 MW

The rated thermal input of relevant on-site fuel consuming equipment (emergency generators) will exceed 20 MWth; therefore, a Greenhouse Gas (GHG) Permit is required for the operational phase of the proposed development. The GHG permit will be applied for by the operator in advance of the commissioning phase, as and when the site fuel consuming equipment exceeds a rated thermal input of 20 MW.

1.4 CONTRIBUTORS TO THE EIA REPORT

The preparation and co-ordination of this EIA Report has been completed by AWN Consulting and specialist subcontractors. Specialist inputs were provided by the following (Table 1.1).

Table 1.1 *Roles and Responsibilities in the EIA Report*

Role		Company
EIA Project Management		AWN Consulting
Engineering Design		ARC-MC, Clifton Scannell Emerson (CSEA) and Hurley Palmer Flatt
Architectural Design		ARC-MC
Planning Consultant		John Spain Associates
EIA Chapter No.	Chapter Title	Company and Consultant
	Non-Technical Summary	AWN – Input from each specialist
Chapter 1	Introduction	AWN – Teri Hayes

Chapter 2	Description of the Proposed Development	AWN – Teri Hayes
Chapter 3	Planning and Development Context and Alternatives	AWN – Teri Hayes and Jonathan Gauntlett
Chapter 4	Population and Human Health	AWN – Teri Hayes with specialist input from Damian Kelly and Jovanna Arndt
Chapter 5	Land, Soils, Geology & Hydrogeology	AWN Pat Groves and Colm Driver
Chapter 6	Hydrology	AWN – Pat Groves and Colm Driver
Chapter 7	Biodiversity (including AA Screening Report)	Scott Cawley – Siofra Quigley and Kate-Marie O'Connor
Chapter 8	Air Quality & Climate	AWN – Dr Edward Porter and Dr.Jovanna Arndt
Chapter 9	Noise & Vibration	AWN – Damian Kelly
Chapter 10	Landscape and Visual	Nicholas de Jong Associates - Samuel McKeever
Chapter 11	Archaeological, Architectural and Cultural Heritage	IAC Archaeology – Faith Bailey
Chapter 12	Traffic & Transportation	Alan Lipscombe Traffic and Transport Consultants Ltd.
Chapter 13	Material Assets	AWN – Teri Hayes
Chapter 14	Waste Management (including C&D Waste Management Plan)	AWN – Chonaill Bradley
Chapter 15	Interactions-Interrelationship between the Aspects	AWN – Teri Hayes

Project Director, Teri Hayes, BSc MSc PGeo. Teri is a Director with AWN Consulting with 25 years of experience in water resource management and environmental assessment and risk analysis. Teri is a professional member of the International Association of Hydrogeologists (Irish Group) – former president and a professional member of the Institute of Geologists of Ireland She has project managed and contributed to numerous environmental impact assessments and design of appropriate mitigation measures, acted as an expert witness at public hearings, lectured in EIA for post graduate classes and providing expert advice on EIA sections for planning authorities. Teri is experienced in projects with ecological sensitivities having worked on the Ennis Flood Study, Doonbeg golf club and Kildare By-pass. She is also familiar with the design and impacts of datacentre and energy project developments having worked on similar developments for most of the datacentre operators in Ireland.

Land, Soils, Geology, Hydrogeology & Hydrology

Pat Groves (*BSc, HDip EIA HDip Env Eng MSc Env. Hydrogeology*)**.** Pat is a Senior Hydrogeological Consultant with the Water Team at AWN, with over 18 years' experience in the field of environmental sciences including hydrogeology, soils, geology, geotechnical engineering, and impact assessment. His role at AWN includes responsibility for groundwater related projects including groundwater resource management and assessment, aquifer characterisation and source protection plans, groundwater modelling, hydrogeology and geology in EIAR. He is involved in project managing IPPC groundwater monitoring sites, contaminated land assessments, and

had an advisory role for the EPA National WFD Groundwater Monitoring Programme in 2012. His experience also includes the provision of hydrogeological conceptual site models (CSM) and ArcGIS mapping. Pat is member of the International Association of Hydrogeologists (Irish Group).

Colm Driver (*BSc MSc MIT*). Colm is an Environmental Consultant (Hydrogeologist) with AWN Consulting with over 5 years' experience in the field of environmental sciences including hydrogeology, soils, geology, geotechnical engineering, and impact assessment. His role at AWN includes responsibility for groundwater related projects including groundwater resource management and assessment, aquifer characterisation and source protection plans, contaminated land assessments, groundwater modelling, hydrogeology and geology in EIAR. His experience also includes the provision of hydrogeological conceptual site models (CSM) and ArcGIS mapping. Colm is a member of the International Association of Hydrogeologists (Irish Group), Irish Brownfield Network and Institute of Geologists Ireland.

Teri Hayes (as above)

Biodiversity/Appropriate Assessment,

Síofra Quigley B.Sc. (Hons) M.Sc. is a Consultant Ecologist with Scott Cawley. She obtained an honours degree in Zoology, from National University of Ireland Galway, and a Masters in Wildlife Biology and Conservation from Edinburgh Napier University. She has four years' professional experience working in the UK on large to small scale infrastructure projects, with governmental and private clients. Síofra is experienced in carrying out field surveys in several protected species, including bat, otter, badger, red squirrel, reptile, pine marten and mountain hare. She has also been involved in radio tracking mountain hares and bats, bat call analysis, badger bait marking, acting as an Ecological Clerk of Works, Phase 1 habitat surveys and reports (JNCC standard), and carrying out desk top studies. Since joining Scott Cawley, Síofra's work involves the preparation of reports, including Ecological Impact Assessment and Appropriate Assessment reports for residential, commercial, and infrastructural projects across Ireland.

Kate-Marie O'Connor B.A. (Hons) M.Sc. MCIEEM is an experienced ecologist with over eight years' experience in professional ecological consultancy. She holds an honours degree in Natural Sciences from Trinity College Dublin, specialising in Botany, and obtained a distinction in her Masters in Environmental Modelling, Monitoring and Reconstruction from the University of Manchester. She also holds an advanced diploma in Planning and Environmental Law from The Honourable Society of King's Inn. She is a Full Member of the CIEEM. Her experience as a principal ecologist has focused on the preparation of ecological assessments, most frequently for EIA and AA, with all the key elements of those processes including planning for and undertaking ecological baseline surveys, desk studies, analysis and presentation of data and results, undertaking assessment of impacts and identifying appropriate mitigation measures. She has worked on a range of public and private sector schemes in the UK and Ireland. Kate-Marie has a specialist interest in botany but is also competent in a range of fauna surveys (*e.g.* mammals including badgers, bats and otters, and newts).

Andrew Speer B.Sc. (Hons) Pg.D. Adv.Dp MCIEEM is a Technical Director at Scott Cawley Ltd. with over 14 years' professional ecological consultancy experience in ecological impact assessment. Andrew is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and holds an honours degree in Zoology from NUI Galway, a Postgraduate Diploma in Geographic Information Systems (GIS) from the University of Ulster and an Advanced Diploma in Planning and

Environmental Law from Kings Inns. He has extensive experience in the Appropriate Assessment (AA) process and has been the lead author for the preparation of numerous Screening for Appropriate Assessment Reports, Natura Impact Statements (NISs) and Natura Impact Reports (NIRs). Andrew also provides technical review and due diligence of Appropriate Assessment documentation for public and local authorities to aid their decision-making process as well as peer review of AA documentation prior to lodgement of planning applications.

Air Quality & Climate,

Dr. Edward Porter is Director with responsibility for Air Quality with AWN Consulting and has completed Chapter 9. He holds a BSc from the University of Sussex (Chemistry), has completed a PhD in Environmental Chemistry (Air Quality) in UCD where he graduated in 1997 and is a Full Member of the Royal Society of Chemistry (MRSC CChem), the Institute of Environmental Sciences (MIEnvSc) and the Institute of Air Quality Management (MIAQM). He specialises in the fields of air quality, EIA and air dispersion modelling.

Jovanna Arndt BSc PhD is a Senior Air Quality Consultant with AWN Consulting. Dr. Jovanna Arndt holds a BSc (Hons) in Environmental Science and a PhD in Atmospheric Chemistry from UCC and is a member of the Institute of Air Quality Management. Jovanna has specialised in air quality since 2010 and has extensive knowledge of air dispersion modelling of a variety of infrastructure projects, including power stations, and is experienced in monitoring and managing the associated air quality impacts.

Noise & Vibration, Damian Kelly BSc MSc is a Director and Principal Acoustic Consultant with AWN Consulting. Damian holds a BSc from DCU and an MSc from Queens University Belfast. He has over 18 years' experience as an acoustic consultant. He is a member of the Institute of Acoustics. He has extensive knowledge in the field of noise modelling and prediction, having prepared the largest and most complex examples of road and industrial noise models currently in existence in Ireland. He was also co-author of the EPA document "*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities" (2012)* and advised in relation to the noise limits applied to commercial developments by the various local authorities in the Dublin region.

Landscape and Visual Impact Assessment, Samuel McKeever MA (Hons) CMLI is a Senior Landscape Architect with Nicholas de Jong Associates with 14 years' experience in the private sector. He is a chartered member of the UK Landscape Institute. Samuel has over 11 years' experience of preparing Landscape and Visual Impact Assessments. These have included projects such as large scale windfarms in Scotland, offshore gas and oil exploration, transmission lines, residential developments and the New Istanbul Airport. Samuel is also highly experienced in Landscape Design having worked on numerous residential and mixed-use developments in Ireland, Northern Ireland, Scotland and England and a number of public realm spaces in Ireland.

Archaeology, Faith Bailey BA is an Associate Director, Project Manager and Senior Archaeologist and Cultural Heritage Consultant with IAC Archaeology. She holds an MA in Cultural Landscape Management (archaeology and built heritage) and a BA in single honours archaeology from the University of Wales, Lampeter. She is a licence eligible archaeologist, a member of the Chartered Institute of for Archaeologists, a member of the Institute of Archaeologists of Ireland and has over 18 years' experience working in the commercial archaeological and cultural heritage sector. As an EIAR

Archaeologist and cultural heritage consultant, she has been responsible for the production and delivery of a large number of archaeological and built heritage assessments and EIAR chapters associated with all sectors of development in the Republic and Northern Ireland. She has acted as the cultural heritage expert witness at multiple Oral Hearings, with the most recent examples being the Limerick-Foynes Road Scheme (2021) and Galway Ring Road (2020/21).

Traffic & Transportation, Alan Lipscombe (BAI, BA) is a traffic engineer with ten years' experience in the traffic and transportation field. This section of the EIAR has been prepared by Alan Lipscombe of Alan Lipscombe Traffic and Transport Consultants Ltd. Alan is a competent expert in traffic and transport assessments. In 2007 Alan set up a traffic and transportation consultancy providing advice for a range of clients in the private and public sectors. Prior to this Alan was a founding member of Colin Buchanan's Galway office having moved there as the senior transportation engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout the West of Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the NUI Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic and transport modelling, including over 20 wind farm developments, and is an accomplished analyst who has experience of a wide variety of modelling packages and methods.

Waste Management, Chonaill Bradley, BSc (Environmental Science) is an Associate Member of the Institute of Waste Management (AssocCIWM). He is a Senior Environmental Consultant in AWN and has over 7 years' experience in environmental consultancy experience in Waste Management and Environmental Impact Assessment. He has helped coordinated and prepare specialist inputs including the Waste Management Chapters, Operational and C&D Waste Management Plans and Construction environmental Management Plans for numerous EIS/EIA/EIAR's.

1.5 DESCRIPTION OF EFFECTS

The quality, magnitude and duration of potential effects are defined in accordance with the criteria provided in the EPA Draft *'Guidelines on the information to be contained in Environmental Impact Assessment Reports'* (2017) as outlined in Table 1.2.

Table 1.2. *Description of Effects as per EPA Guidelines (Draft, 2017), Table 3.3.*

Effect Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
	Neutral	A change which does not affect the quality of the environment
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An impact capable of measurement but without noticeable consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities

Effect Characteristic	Term	Description
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	Profound	An impact which obliterates sensitive characteristics
Duration of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day
	Temporary Effects	Effects lasting less than a year
	Short-term Effects	Effects lasting one to seven years.
	Medium-term Effects	Effects lasting seven to fifteen years
	Long-term Effects	Effects lasting fifteen to sixty years
	Permanent Effects	Effects lasting over sixty years
	Reversible Effects	Effects that can be undone, for example through remediation or restoration
Probability of Effects	Likely Effects	The effects that can reasonably be expected to occur as a result of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Type of Effects	Indirect Effects	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing'	The environment as it would be in the future should no development of any kind be carried out
	`Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic	Where the resultant impact is of greater significance than the sum of its constituents

1.6 ADDITIONAL ASSESSMENTS REQUIRED

This section addresses the additional approvals and assessments required under other EU Directives and legislation, which were undertaken:

- **Appropriate Assessment Screening Report** and **Natura Impact Statement** –has been completed for the Proposed Development, as required under the Habitats and Birds Directive (92/43/EEC and 79/409/EEC) and is appended to Chapter 8 Biodiversity as Appendix 8.1; and
- Flood Risk Assessment - A site specific flood risk assessment has been undertaken by CSEA for the site and is included with the planning documentation.

In addition, the following reports have been prepared::

- **Energy and Sustainability Statement** prepared by Hurley Palmer Flatt
- **Construction Environmental Management Plan** prepared by AWN which includes a **Construction Surface Water Management Plan** prepared by CSEA and **Construction Traffic Management Plan** prepared by Alan Lipscombe Traffic and Transport Consultants Ltd.
- **Landscape Management Plan** – Nicholas de Jong Associates

1.7 FORECASTING METHODS AND DIFFICULTIES IN COMPILING THE SPECIFIED INFORMATION

Forecasting methods and evidence used to identify and assess the effects on the environment for each environmental aspect are set out in each chapter.

Any challenges encountered during the assessment of individual factors are noted within the relevant chapters.

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 INTRODUCTION

The applicant is proposing to develop six data storage facilities, an energy centre an Above Ground Installation (AGI) building, vertical farm, a substation compound and associated ancillary development on a greenfield site (previously used for agriculture and hosting power transmission infrastructure) in the townlands of Tooreen and Cahernalough, Co Clare. The land is zoned as Enterprise (ENT3) and 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 (ref Clare County Development Plan 2017-2023).

This chapter presents the description of the project comprising information on the site, design, size and other relevant features of the project as required by the 2011 EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive (2014/52/EU) (herein referred to as the EIA Directive) and the Draft EPA "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports"* (2017) (herein referred to the as the EPA Guidelines 2017) and the EPA Draft "*Advice Notes for Preparing Environmental Impact Statements"* (2015) (herein referred to as the EPA Advice Notes 2015). The European Commission guidance '*Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report"* published by the European Union in 2017 was also considered in the preparation of this EIA Report.

This chapter summarises the proposed development and the lifecycle of the facility (construction, operation and decommissioning). The EIAR should be read in conjunction with the planning package that includes complete elevations and floor plans site, layout plans including utilities and building drawings and accompanying reports.

2.2 DEVELOPMENT SITE

The development footprint is c. 60 hectares (ha) and is located to the east of Ennis in the townland of Tooreen and Cahernalough with small sections extending west into the townlands of Ballymacahill and Knockanean. 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 and overhead powerlines connecting to the existing Ennis 110kv Substation that adjoins the western boundary.

Figure 2.1 below presents the lands subject to this planning application (red line boundary) and land ownership area (blue dashed line).

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 contains a number of existing dwellings and eight farm outbuildings. A number of these will be retained and some (one house and eight farm buildings) demolished as part of the proposed site redevelopment. Further information is included in the demolition report provided with this planning submission and also addressed in Chapter 13 (Waste) and the Construction Environmental Management plan (CEMP).

The site gradient is quite variable but overall falls from east to west/southwest with elevation c.15 meters ordinance datum (mOD) in the West and 46 mOD in the East Regional surface water drainage comprises the Ballymacahill River to the north/ west of the development site boundary and which flows in a NE to SW direction. The river is also known as the Spancilhill (EPA, 2021) and converges with the River Fergus farther to the SW which ultimately discharges into the Shannon Estuary.

Local drainage within the development boundary is less defined. Surface water features within the site boundary comprise a series of ponds to the north with variable seepage to ground, and Toureen Lough to the south near the R352. Spring discharges have been identified mainly to the west of the site and include a spring to the immediate east of Toureen Lough discharging to this feature, and a spring to the northwest of the lough which, it likely receives groundwater from a known swallow hole located farther east and south of the R352 road. Toureen Lough also discharges into the Ballymacahill River observed at a spring discharge.

2.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development comprises:

- 6 data centres buildings.
- A gas powered energy centre and Above Ground Installation (AGI).
- A new 110kV substation, two drop down masts and underground grid connection.
- Fibre connection,
- Connection and upgrade of foul sewer and mains supply extending along the existing R352.
- Undergrounding of two of the existing overhead 110kv circuits.
- Associated Infrastructure; roads, attenuation pond etc.
- Demolition of a single house and 8 farm buildings

Figure 2.1 presents the site layout for the proposed masterplan. The site layout reserves c. 10 ha of lands as ecological and archaeological buffer zones. The buffer zones were delineated following assessment undertaken as part of the area assessment within the Clare County Development Plan 2017 – 2023 (Variation No. 1). Further assessment has been undertaken by the project ecologist to protect ecology during construction and operation of the proposed development. The redline boundary includes c. 2.1 km of the existing Tulla Road for connection to sewer.

Two of the 110kV overhead circuits which currently traverse the site will be brought underground to the Ennis substation as they come onto the east side of the site.

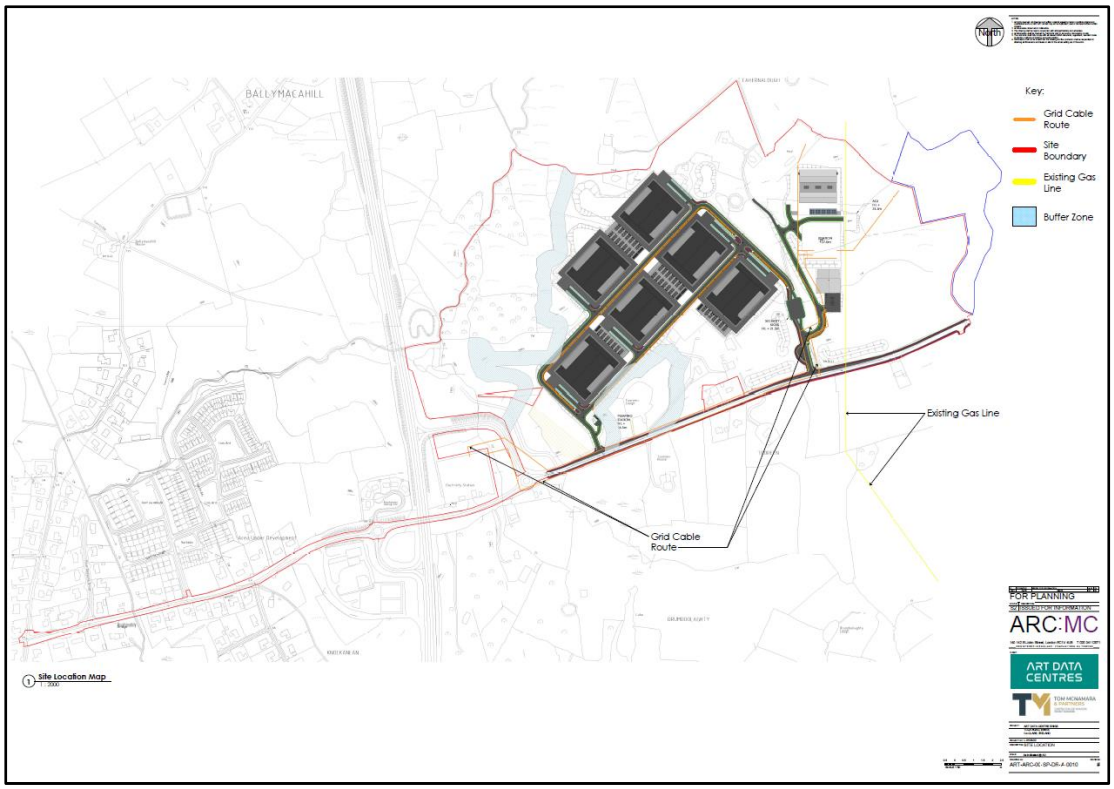


Figure 2.1 *Proposed layout. Blue line showing the ecological and archaeological buffer zones ((ART-ARC-SP-00-DR-A-002).*

The redline boundary including the works along the Tulla Road required for the sewage and water pipeline upgrade .

Proposed Development Phasing

A 10-year permission is sought due to the nature of this specific development and to match market demand over that period. The proposed development will respond to current and future use demands in the area. The logistics of the site and use of the buildings mean that their delivery must be programmed on a phased basis over the duration of a 10-year planning permission. The site will host six data storage facilities with associated energy supply facilities and the commercial reality is that the overall orderly development of the site will take longer than 5 years. Subject to planning approval, construction works are due to commence in June 2023. Three phases of construction are proposed with construction works completing by July 2029. Landscaping is proposed to commence in Oct 2022.

The anticipated phased development is set indicatively in Table 2.1 below.

Table 2.1 *Phasing of the Proposed Development*

Phase	Building Name	Construction Start	Duration (months)	Construction End
1	Primary Infrastructure Substation Datacentre 2 & 3.	June 2023	27	September 2025
2	Energy Centre Vertical Farm	September 2025	25	October 2027

	Datacentre 4 & 5.			
3	Energy Centre (Engines 7-18) Datacentre 1 & 6.	June 2027	25	July 2029

The expected construction phasing is shown in Figure 2.2 below.

Figure 2.3 *Intended Construction Phasing for the proposed Masterplan (ART-ARC-SP-00-DR-A-0003).*

2.3.1 Proposed Data Centre Development

A data storage facility is a centralised hub for the secure storage, management and distribution of electronic information to individual businesses and organisations. With the levels of online activity increasing rapidly this facility will enable the Applicant to meet its clients growing demands. The proposed data storage facilities offer clients the latest in power, and connectivity with hardened security to control access to client information.

Each data storage facility, when completed, will allow the Applicants' clients store their information at a secure and reliable facility off their premises more efficiently than traditional forms of in-house data storage systems. Data storage facilities are typically constructed on a relatively large scale which results in significant benefits in terms of economies of scale and energy efficiency.

Each data storage facility will require up to a maximum of 27 MW IT load (circa 34 MW total load). With 6 data storage facilities operating the total load will be 200 MW.

Data storage facilities have;

- high levels of reliability with built in redundancy systems;
- 24/7 monitoring of the facility and its systems by staff;
- lower network latency and higher bandwidth at lower cost;
- specialist network and facilities engineers typically not viably employed by individuals, businesses or organisations, and;
- high levels of energy efficiency.

Irish climatic conditions generally allow for data storage facilities to be cooled using air cooling however there will be an occasional requirement to use evaporative cooling. Typically, evaporative cooling is required when temperatures exceed 27°C (Approximately 2% of the year). When evaporative cooling is required the average rate of demand for the proposed development is estimated to be less than 1,000m^3 /day for the whole site. It is proposed to store the equivalent of 48 hours of rainwater at each data storage facility for the purpose of supplying the evaporative coolers prior to using the public water supply. Of the water supplied, only 40% will be discharged to the surface water system as the remainder will be lost to evaporation in the cooling process. This results in an average daily discharge of 400m^3/day. The peak rate of discharge for the proposed development will be 205 l/s. As the cooling water will only be required during periods of hot dry weather (i.e. temperature exceeds, 27°C), the discharge to the surface water network will not coincide with any rainfall events

As evidenced by the numerous other data storage facilities recently developed in Ireland, our temperate climate is ideally suited to data storage facilities. The naturally cool ambient temperature means the data halls require less cooling than if the facility were located in regions of the world subject to greater temperature and humidity variation.

A summary of the data storage facility is as follows:

- 6 no data halls. These are 86 x 105 x 18m high and will consist of multi levels 9m slab to slab for the data halls and air handling units and 4.5m slab to slab for offices and ancillary plant and support.
- Data halls are intended to have backup (standby) generators for emergency use only () situated along one elevation of the building. These will provide the necessary power to ensure the data halls operate optimally even in the event of a failure of supply. The diesel generators will have associated 8m high flues to meet air quality standards (Chapter 8 Air & Climate).
- For three of the six data centre storage facilities, fuel oil for the emergency generators is required. Each of these datacentres in their service yard, will have up to 7 bunded above ground bulk storage tanks for fuel oil (440m^3 per data storage facility), distribution pumps, overground delivery pipeline to the belly tanks for diesel fired standby generators within each data storage facility. The service yards are hard stand and located adjacent to the datacentre buildings.
- Storm drainage from the loading area at each service yard will discharge through an oil interceptor.
- Solar Panels and Rainwater harvesting included in the design.
- Warm air emissions partly used within the on site vertical farm.
- Admin area – for limited office and support services. These occupied areas will be provided with heating and cooling systems and hot water generation, using air source heat pumps to reduce energy and carbon emissions. If heat recovery can be used from the heat generated in the data halls, then this will

be used. In addition, wherever possible natural light will be provided via roof lights or “borrowed light”.

A total of c. 450-475 staff will be employed on site on the completion of the Art Data Centre Campus.

2.3.2 Proposed Substation Development, undergrounding of overhead lines and grid line.

A new substation will be created on the site, partly for extending Eirgrid’s substation (the existing has no additional space) and for transforming down to 10kV / 20kV for distribution to the data centres. Dual feeders will be provided to each data centre via a set of underground ducts that will be created in the service roads. The proposed substation development will comprise two elements, firstly an extension to Eirgrid’s existing Ennis Substation using 110kV Hybrid Gas Insulated Switchgear (GIS) (circa 1,800 square metres and 8 m high) and secondly a 110kV transformer substation compound (circa 2,300 square metres and 8 m high) dedicated to the Art Data Centre site. The two compounds will be separated and have their accesses for the Client and Eirgrid and will be afforded 24/7 access.

In more detail the two compounds will incorporate the following:

New Eirgrid Compound

- 1 no outdoor hybrid Gas Insulated Switchgear (GIS) switchboard with 8 no. 110kV bays and rated for the system voltage of 110 kV;
- Two 110kV underground cables which will connect to a new above ground end tower (termination).These will connect to the existing circuits to Agannygal and Ardnacrusha via
- Two 110kV underground cables for feeding to the Art Data Centre substation
- Internal access roads and turning head;
- A circa 2.6-metre-high palisade fence;
- Drainage infrastructure; and
- All associated and ancillary site development works.
- It is intended that all of the above will be provided and adopted by Eirgrid.

Art Data Centre Compound

- 2 no. Midel oil-filled 100MVA step-down double wound 110/20/10kV power transformers positioned within bunded enclosures; (height circa 6 metres);
- 8 no. lightning protection masts (height circa 15 metres);
- Two single storey buildings used for 20/10 kV switchgear control and ancillary (each approx. 20m x 6m x 6m height)
- Internal access roads and turning head
- A circa 2.6-metre-high palisade fence;
- Drainage infrastructure; and
- All associated and ancillary site development works.

The proposed substation development will be supplied from two drop down masts located on the east of the site.

Undergrounding of existing overhead lines

As part of the provision for power, for the development, there will be two overhead cables rerouted underground to the new substation and subsequently routed to the existing Eirgrid substation via the Tulla Road.

New end masts will be built on the north east of the site, breaking into the existing lines and diverting the circuits via underground ducting to Ennis Substation. The route of the proposed grid line is partly within the site and along the Tulla road.

The 110 kV underground cable feeders will comprise 110 kV circuits installed underground in HDPE ducting in a trefoil arrangement. The 110kV cables will be a standard XLPE (cross-linked polyethylene) copper cable. XLPE does not contain oil, therefore there is no risk of migration of oil into ground in the event of a failure. The installation of the HDPE ducting will require the excavation of trenches along the final connection route. The trenches will typically run either side of the roadway along the length of the route, the separation of the 2 circuits will ideally be at least 3m depending on the existing ground conditions and existing underground services. The typical optimum depth of excavation required to facilitate installation of the ducting is 1.25m below ground level (bgl) but may increase to up to c. 3.0m at utility crossings. The typical optimum width of each trench is 0.6m, however this may vary depending on ground conditions and existing services.

Typical cross section of the trench utilising trefoil duct arrangement for the 110 kV cables is illustrated in Figure 2.4.

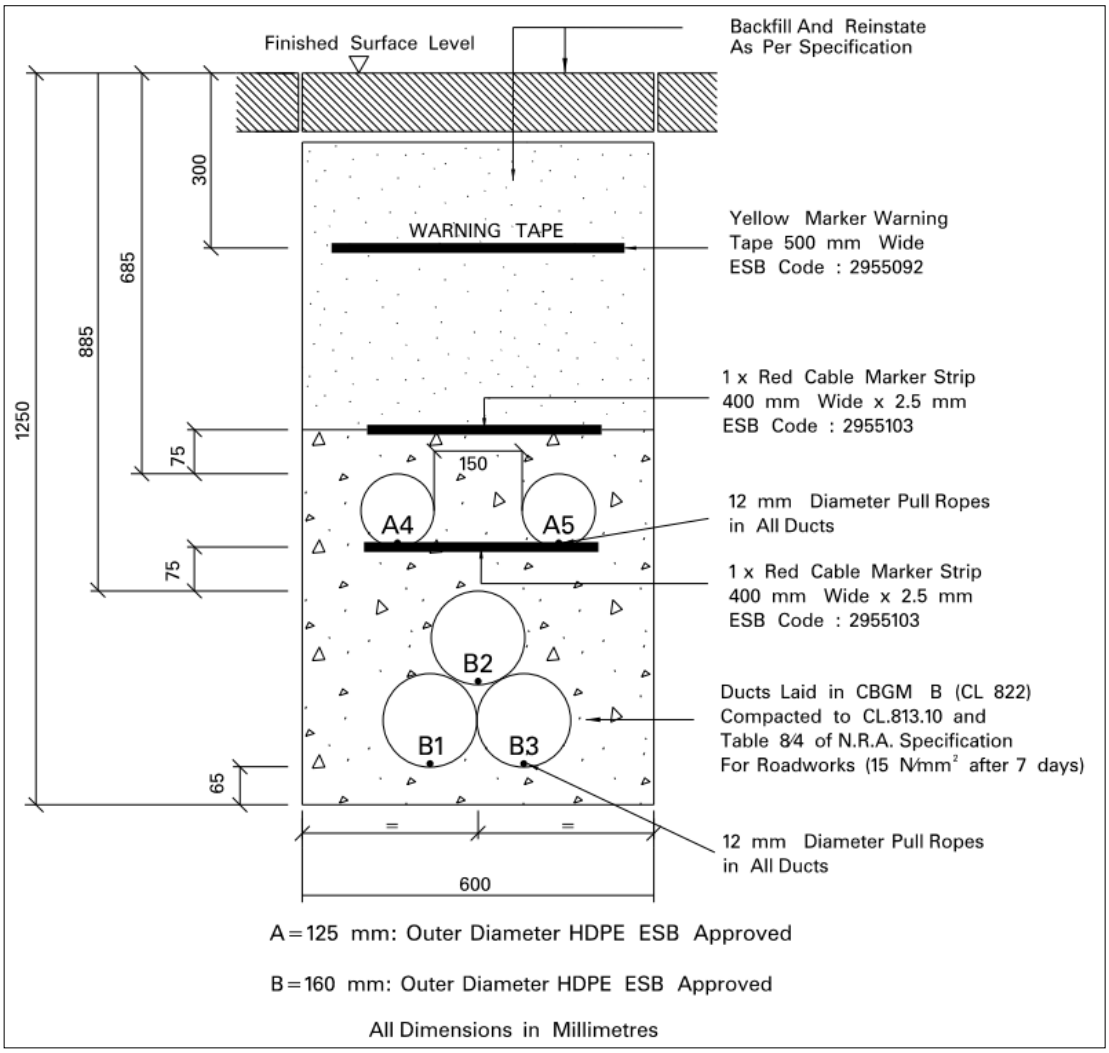


Figure 2.4 *Typical Cross Section of Trench Trefoil Duct Arrangement for 110 kV underground cables*

2.3.3 Proposed Energy Centre and Above Ground Installation Development

The energy centre will primarily comprise 18 no. lean-burn natural gas engines which are the most efficient form of internal combustion engines. Each generator will have its own flue of 25m height. These will be aggregated into 3 groups of flues to meet air quality requirements. Air modelling has been undertaken to confirm the flue discharge will meet air quality standards with selective catalytic reduction (SCR) abatement (Chapter 8 Air & Climate).

The energy centre will be fully self-sufficient in terms of its power and cooling requirements. Cooling is provided through roof mounted attenuated dry air coolers which will be behind a plant screen. The energy centre is to be connected to the adjacent national high pressure gas network. A pressure reduction station is included in the design to reduce the gas pressure for use in the energy centre.

The energy centre will be on a 110m x 100m plot and buildings within the compound will be 8 m high. The building will house an office and welfare facilities and associated parking.

For the energy centre where there will be continuous running generators, fuel oil and urea are the only required bulk chemicals required. The fuel oil will be used as back-up to the normal gas supply for the energy centre and will be located withing the service yard adjacent to the energy centre. Oil will be stored in bunded above ground bulk storage tanks for fuel oil (total of 1,440m^3 of fuel oil), distribution pumps, overground delivery pipeline to the day tanks for dual fuel fired generators. In addition, within the energy centre it is proposed to store up to 18m^3 of urea for use with the SCR mitigation in the exhausts of the generators.

2.3.4 Proposed Vertical Farm Development – Heat Recovery Use

It is proposed to recover the heat from the data halls in the datacentre buildings for use in the "Vertical Farm" for growing high value plants etc. These farms require heating to the water and air used to support the plants to promote growth internally, and so the heat from the data centres would be ideal and would not require the temperatures to be elevated any further, so no additional energy input.

The vertical farm will be c. 50 x 50 x 12m high. It will comprise c. 60% growing space and 40% office area. The farm will provide high value crops such as herbs.

The vertical farm will employ 40 full time roles and 10 additional part time. The farm will operate a single shift. Deliveries of raw materials and removal of product will result in c. 5 HGVs per day with pick up times likely to be 6.30 to 9 am.

2.3.5 Overall Site Design and Landscaping

The buildings have been located on the site to take maximum use of the undulating nature of the land by siting structures at lower levels to take advantage of topography to reduce visual impact of structures. The structures are set back from the Tulla Road and dwellings by c. 100m (closest residence is 107 m) and will be screened by the introduction of new landscaping and woodland. The buildings have also been positioned outside of ecological and environmental protected areas with suitable buffer zones. The site will operate as a "dark site" in order to minimise light spill impacts.

The site perimeter will consist of berming and landscaping incorporating local species discussed further in Chapter 11 (Landscape) and required security infrastructure . Although the proposed development will incur loss of existing hedgerows, the proposed landscaping design, once established, will include new hedgerows planting in the order of three times the current extent. The proposed landscape design will focus on enhancing local biodiversity by incorporating native species and pollinator planting. As outlined in Chapter 10 and the CEMP, landscaping will commence ahead of the main construction works to ensure early establishment.

2.4 SITE UTILITIES AND INFRASTRUCTURE

2.4.1 Electricity

The six data storage facilities will require up to 200 MW load. This requirement will be provided by power from the national grid, an energy centre with gas generators and emergency backup provided by diesel generators.

A power application with Eirgrid for 83.5MVA is in their Pre-planning Stage 1 Process.

The six data storage facilities will be powered by a combination of power from the grid

via the existing Ennis Substation adjoining the site and the energy centre, which is proposed to be constructed adjacent to the high pressure gas line that runs through the site. The applicant intends to construct the energy centre to respond to flexibility to the evolving energy market, in particular to ensure there will be sufficient capacity to have the security of supply and also respond to any future grid capacity constraints.

A maximum of three data storage facilities will also have diesel powered back-up generators, as a contingency power measure in the event of a loss of electrical power supply loss from the Ennis primary substation. The likelihood of all of these generators being required to run is extremely low, no more than once in 10 years, however each set will require to be tested typically for up to 2 hours, once a month. Each set will have strict acoustic attenuation to ensure that overall noise levels on the site are not increased. These data storage facilities will have 84 backup generators which will be lined along one elevation of each datacentre building. These will provide the necessary power to ensure the data halls operate optimally even in the event of a failure of supply from the energy centre. The diesel generators will have associated circa 8m high flues to meet air quality standards. Each diesel generator will be served by a double lined belly tank. With the main oil storage within the service yards of each datacentre. An overground fuel line will extend from the bunded fuel storage within the service yard provided for each building.

In the event of the gas supply failing, the three data storage facilities which are provided with power by the gas powered engines will continue to be provided with power resupplied with on-site stored diesel as the engines with have a dual fuel capability. The engines which will typically be of between 5 and 10MW per set, will have flues combined together with an expected height of circa 8m high to meet air quality standards.

2.4.2 Water Demand

A 450 diameter mains runs along the Tulla Road and following a proposed upgrade for connection (within the existing road), has capacity to supply adequate water for the proposed development. Peak daily usage will be 48 l/s and average demand 11.2l/s (Adiabatic Cooling System) during high temperature condition) plus 1.2 l/s for domestic use. On the rare occasions that evaporative cooling is required (temperature of 27^{o}C) the requirement is 1,000 m^3 /day for the whole site.

Consultation with CCC has confirmed that sufficient water capacity is available and a PCE application has been submitted to Irish Water (IW).

2.4.3 Site Drainage

Foul water

A temporary trench excavation along the Tulla road will be undertaken to facilitate pipe laying for connection with the existing pumping station of Gort Na mBlath located approximately 550 m west of the main site. The wastewater ultimately discharges to Ennis North (Clonroadmore) WWTP Reg D0048.

There is no trade effluent proposed for this development. Consultation with CCC has confirmed that sufficient wastewater capacity is available and a pre-connection enquiry PCE application form has been submitted to Irish Water (IW). The designed Dry Weather Flow DWF of the development is 20.9 m^3/day. The proposed foul drainage service will incorporate a foul pumping station and associated rising main which will

also include a 24-hour emergency storage tank (in the unlikely event that the proposed foul pump malfunctions).

Surface water

The proposed surface water drainage service to the development comprises various drainage components including positive stormwater networks, attenuation systems and several Sustainable Drainage Systems (SuDS) elements. The proposed surface water drainage was designed in accordance with the SuDS Manual 2015.

The hardstand area of the site is 17.3 ha and attenuation has been designed on site for the 1:100 yr. flood event including consideration of a 20 % allowance for climate change. An over flow sub-surface pipeline will discharge at current discharge rates (greenfield) to the Ballymacahill River. Drainage will be from a single lined attenuation pond.

Rainwater run-off from the roofs of the six datacentres will be collected and will feed water harvesting tanks with any excess overflow into the common road drainage network. This water will be available as cooling water. Other SuDs measures will include permeable paving and swales. These drains and swales will discharge to a surface water attenuation pond where the discharge will be controlled using a "Hydrobrake Optimum" vortex flow control device to limit the maximum discharge to 50 l/s during the 1/100 year storm (the calculated Qbar value attributed to the site is 61l/s). The attenuation pond to be constructed to retain a constant volume of water to promote settling and reduce conveyance of suspended solids and other particles to the receiving waters. An attenuation volume of 9293 m^3 is designed as part of the proposed development. A Class (I) bypass separator with a suitable capacity will be installed downstream of the proposed hydrobrake. The function of the separator is to intercept pollutants (any petroleum /oil) and prevent their entry to the Ballymacahill River. As such there is no potential for increase or flooding or impact on water quality as a result of the proposed development. Further details are provided in Chapter 7 of the EIAR and within the CSEA engineering report prepared for planning.

2.4.4 Telecommunications

Fibre will be provided from a number of sources for security of supply. Each fibre provider will need to lay ducts to make connections to their existing systems.

2.4.5 Natural Gas

The site is traversed by a high pressure Gas Networks Ireland gas pipeline. An AGI will be constructed to facilitate supply for the energy centre.

2.4.6 Roads and Site Access Road Infrastructure

The development site is currently accessed from Tulla Road directly to the south. The site has good connection to the M18/N18 national motorway that connects the cities of Limerick and Galway.

The main access to the proposed development site will be off the Tulla Road along the southern boundary, with a secondary access and egress for emergency use only off the Tulla road to the west of the main entrance. These entrances will connect to an internal road network that will serve two purposes public 24/7 access to the Vertical Farm, Sub stations, Energy Centre, and Gas AGI; and to provide a secure private road

network circumnavigating the Data Centres for staff access, connection between buildings and for the delivery of equipment and materials.

The proposed access arrangements and potential traffic safety impacts are considered in Chapter 12 (Traffic and Transportation).

Off Site Traffic Movements

The proposed development will result in an increase in traffic owing to staff movements and the delivery of materials to and from the site during construction and the operational phase.

During the construction phase it is estimated that up to a maximum of 115 deliveries will be made to and from the site in any one day, with a daily average of 32 daily HGV trips to and from the site forecast. At any one time it is estimated that up to 800 daily car trips will be generated by construction staff, with an average of approximately 400 forecast for the duration of the construction period. While these trip rates were adopted for the purpose of the assessment, it is intended that a significant proportion of construction staff will travel to the site by buses provided by the contractor, which will form one element of a construction traffic management plan, aimed at minimising traffic impacts during construction.

Data centres have a comparatively low level of traffic e.g. it is forecast that a total of 493 staff members will travel to/from the site each day when fully operational. With staff working shifts throughout the 24-hour period, it is forecast that a maximum of 256 staff will be on site at any one time. When fully operational it is forecast that 32 HGVs will visit the site per day.

The wider area has excellent links to the national primary routes. Further details in relation to the potential impact of the proposed development (construction and operation) in terms of traffic are presented in Chapter 12 Traffic and Transportation.

2.4.7 Fuel Oil

In the event of a loss of power supply, the emergency generators are designed to automatically activate and provide power to the data storage facility. The generators will be supplied by low sulphur diesel.

Fuel oil for the emergency generators is the only required bulk chemical required on site. Three of the six datacentres in their loading bay, will have up to 7 bunded above ground bulk storage tanks for fuel oil (440m^3 for three data storage facilities), distribution pumps, overground delivery pipeline to the belly tanks for diesel fired standby generators within each data storage facility.

All bunds will be capable of containing 110% of the volume of the largest drum/tank within the bund or 25% of the total volume of the substance stored and will designed in accordance with the EPA's guidelines for the storage and transfer of materials for scheduled activities (EPA, 2004). Fuel oil will be delivered to the site by HGV road tankers, with an average of three tankers expected to be travelling to and from the site per month. A dedicated tanker unloading area will be provided at each of these service yards which will be surrounded by a drainage channel to capture any run-off. A class 1 oil-water full retention separator will be installed to capture any oil in the run-off from the pad. Tanks will be fitted with high level alarms to reduce the potential for overfilling.

The energy centre will have back up fuel storage with up to 20 bunded above ground bulk storage tanks for fuel oil (total of 1,440m^3 of fuel oil). The total fuel store will be 2900 m^3 or 2,494 tonnes.

2.4.8 Lighting

External lighting – all of the service roads and pathways will be provided with low illumination levels of downward only lighting for use on an occasional basis, they will not be turned on normally and controlled from the gate house for specific usage. Vehicles coming to the site will use headlights to access the buildings. External plant areas will also be fitted with external lighting and task lighting sockets, but again these will be used for emergency maintenance support. There will also be lighting to the admin areas of each data centre building, so some limited spill of lighting will occur to the admin area facades, but this will be limited and all lighting will be PIR controlled. In terms of security, the whole site will be covered by CCTV cameras but will not require external lighting to be on to operate, instead they will use infra-red coverage to allow the cameras to operate. Lighting is for safety reasons and not operational at night unless in an emergency and for site evacuation. There will be no light spill on any features suitable for bat foraging and commuting

2.5 SUSTAINABILITY MEASURES TO REDUCE ENERGY AND PROMOTE A LOW CARBON MODEL

The measures that are being proposed to reduce energy usage, promote a low carbon model and support sustainability are outlined in the Energy and Sustainability Statement prepared by Hurley Palmer Flatt and provided with planning. A summary is provided below.

Data Centre Buildings

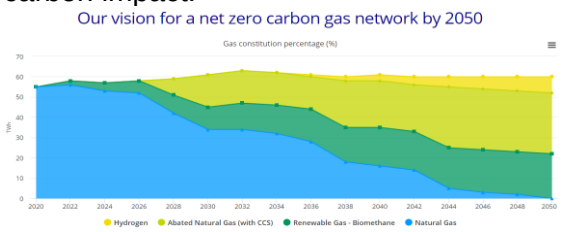
- Cooling – the cooling systems are to be based on direct or indirect air handling plants which will maximise the use of external air to cool the internal areas of the data centre. This technique is recognised in the data centre industry as being one of the best and more efficient methods for cooling resulting in low Power Usage Efficiency (PUE) levels of below 1.2. During summer periods, it is recognised that temperatures could increase above allowable internal environmental limits, thereby requiring a peak lopping process using adiabatic cooling. This will require a water supply to each air handling unit, water demand will be dependent on the external wet bulb temperatures, which is only likely to be required for a few weeks in the summer periods. Extensive rainwater storage will be provided adjacent to each data centre building to meet as much of this peak demand, supplemented by town water supplies as required.
- Solar panels – PV panels will be installed on the roofs of each of the data centre buildings. Final proposed layout and quantum are being worked on now, but each system of PV panels will directly feed the electricity being consumed in each building
- Admin areas – each data centre building will have an admin area for limited office and support spaces. These occupied areas will be provided with heating and cooling systems and hot water generation, using air source heat pumps to reduce energy and carbon emissions. If heat recovery can be used from the heat generated in the data halls, then this will be used. In addition, wherever possible natural light will be provide via roof lights or “borrowed light”.

Site Wide Systems

- Heat recovery use – this has been considered carefully. Recovery of the heat from the data halls in the data centre buildings is possible but it has to be recognised that the heat is relatively low grade at temperatures of around 30 to 40 degrees C. At these temperatures, transporting the heat any significant any distance (e.g. off-site) would further reduce the quality of the heat. To export heat off-site to say a local district heat network, the temperatures would need to be lifted to at least 60 degrees, this would require water based heat pumps (reverse cycle), but these will require further energy (electrical input) to allow the compressors to run to lift the temperatures. Given that there is no current or proposed use for the heat nearby to the site, alternative uses of the heat have been considered, this includes the inclusion of a "Vertical Farm" for growing high value plants etc. These farms require heating to the water and air used to support the plants to promote growth internally, and so the heat from the data centres would be ideal and would not require the temperatures to be elevated any further, so that no additional energy input is required.
- External lighting –Dark site as described above..
- SuDs systems are implemented throughout the site.

Low Carbon Infrastructure

- Initial Energy / Power Source – the site is to be provided with an 80MW+ connection to the existing Ennis Eirgrid substation, this will still leave capacity at the substation for growth of the Ennis town over at least 25 years. To facilitate this connectivity, the substation will be extended onto the data centre site as the existing site has insufficient space to be extended (it is islanded by the road network).
- Hydrogen Usage – the initial provision of generation on site will be based on using Natural Gas from Gas Networks Ireland (GNI). GNI have announced that they are already looking at injecting green or blue hydrogen into their network to improve their carbon impact, as per their Vision 2050. The graph below shows how the use of natural gas will reduce to 0% by 2050. The engines on-site will be specified to work on Natural Gas or Hydrogen or any mix in between in order to future proof the plant and to take the opportunity to reduce the carbon impact.



- Low Carbon Energy – Connecting to the Eirgrid network gives the opportunity to use low carbon energy that is now generated across the island of Ireland through wind generation and photo voltaic solar farms. These renewable sources of energy currently provide up to 40% of the total supply at any one time. This will increase significantly over the next decade or so as more and more renewable capacity is added to the network.
- On Site Generation – the connection to the existing Ennis substation is to be supplemented by gas powered generation in the energy centre to bring the total capacity to circa 200MW. The energy centre will be constructed as the data centre buildings come onstream, with the usage of the first 80MW supply being the priority. All of the gas engines will have SCRs fitted to their exhausts to reduce emissions to very low levels.

2.6 EXISTENCE OF THE PROJECT

Under the current Draft EPA Guidelines on the information to be contained in EIA Reports, the description of the existence of the project is required to define all aspects of the proposed lifecycle of the facility under the following headings:

- Description of Construction;
- Description of Commissioning;
- the Operation of the Project;
- Changes to the Project (including Decommissioning); and
- Description of Other Related Projects.

The following sections present a description of each of these aspects.

2.6.1 Description of Construction

The construction of the data storage facilities will comprise four main stages, namely;

- Site preparation works;
- Building Structure Construction;
- Building Envelop Construction; and
- Internal Fit Out (including Mechanical & Electrical (M&E)) and commissioning.

A brief description of the construction works proposed is set out below.

Working Hours

The construction of the facility will be completed during normal construction hours i.e. 8am to 6pm Monday to Friday. Work outside these hours will only occur in exceptional circumstances for specific tasks and subject to obtaining the agreement of the Planning Authority in that regard.

Staffing and traffic

The construction population on site will be c. 600 staff with an estimated peak of 1200 staff in year 2027 due to the overlap of phases of development. Site staff will include management, engineers, construction crews, supervisors and significant maintenance contractor employment. Based on a modest estimate that the average car occupancy will be 1.5 and no transport by bus, this will result in a maximum number of 800 cars generated by construction staff on site at any one time. It is estimated that 40% and 5% of the daily total will arrive at, and leave from the site during the AM peak hour from 08:00 to 09:00, with the reverse applying to the PM peak hour from 17:00 to 18:00. An Outline Travel Plan is provided with Chapter 12.

For each phase a maximum of 115 HGV trips will be generated to / from the site, with a daily average of 46 trips per day for Phase 1, 13 trips for Phase 2 and 23 trips for Phase 3, as set out in Chapter 12, Table 12.6.

2.6.1.1 Site Preparation Works

The primary activities required during site preparation will be establishment of the contractors' compound and cutting and filling of various parts of the site to provide the necessary base level for construction. It is estimated that this will take approximately 6 months. Landscaping will be undertaken during the initial phase of construction to reduce visual impact.

The contractor compound and car parking for contractors will move as the development proceeds through the different phases. Planned locations are outlined in the CEMP and drawing ART-ARC-SP-00-DR-A-004. No off site parking is required. The compounds will provide office, portable sanitary facilities, equipment storage, parking etc for contractors for the duration of the works. The construction compounds will be fenced off for health and safety reasons so that access is restricted to authorised personnel only. Other works required will include surveying and setting out for structures, rerouting of services, vegetation removal, archaeological recording works and setting up of the construction site with fencing, site compounds etc.

In advance of site preparation, a strategy will be developed in order to efficiently move spoil generated from cutting excavations and soil imported to locations where landscaping is required around the facility Approximately 111,424 m^3 of material will need to be excavated and it is planned that all of the excavated material will be able to be retained and reused onsite for landscaping and fill. Landscaping will occur upon completion of the data centres and will include seeding of the construction car parks and hedgerow planting of the gaps that provided access to the car parks.

The contractor will be required to comply with the CEMP (surface water management and pollution prevention plan) provided with planning. Measures including fencing off and installation of silt fences around ecological buffer zones will be undertaken to prevent any works being undertaken in these areas or the discharge of silty water from works areas.

2.6.1.2 Noise, Vibration and Dust Nuisance Prevention

With regard to construction activities, reference will be made to BS5228: Noise control on construction and open sites, which offers detailed guidance on the control of noise and vibration from demolition and construction activities. Mitigation measures will include the following:

- limiting the hours during which site activities are likely to create high levels of noise are permitted, e.g. soil/rock excavations (if required);
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise, and;
- monitoring typical levels of noise during critical periods and at sensitive locations.

Noise control measures will be employed. These will include:

- selection of plant with low inherent potential for generation of noise;
- erection of barriers as necessary around items such as generators or high duty compressors, and;
- siting of noisy plant as far away from sensitive properties as permitted by site constraints.

The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of dust produced will be deposited close to the generated source.

In order to ensure that no dust nuisance occurs, a series of measures will be implemented.

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic only.
- If required, any area/road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. Indeed, on any un-surfaced site road, this will be 15-20 kph, and on hard surfaced roads as site management dictates.
- In dry conditions vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Wheel washing facilities will be provided for vehicles exiting the site in order to ensure that mud and other wastes are not tracked onto public roads.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- If required, topsoil mounds will be seeded with grass to prevent dust blow off.
- At all times, these procedures will be strictly monitored and assessed. In the event of dust emissions occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

2.6.1.3 Water Discharges

Welfare facilities will be provided for the contractors on site during the construction works. These facilities may be connected to the existing foul drainage system on site or portable sanitary facilities will be provided with waste collected and disposed of appropriately.

Any surface water run-off collecting in excavations will likely contain a high sediment load. This will be diverted to settlement ponds and will not be allowed to directly discharge directly to open water courses.

2.6.1.4 Material Sourcing, Transportation and Storage

Materials

Key materials will include steel, concrete, glass, composite cladding, piping, electrical cabling, process equipment and architectural finishes. A ‘Just In Time’ delivery system will operate to minimise storage of materials on site.

Sourcing

Where possible it is proposed to source general construction materials from the local area to minimise transportation distances. Specialised data storage facility and energy centre equipment will likely be imported from abroad.

Storage

Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination. Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage.

Transportation

Construction materials will be brought to site by road. Construction materials will be transported in clean vehicles. Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape material along the public roadway. A description of likely transport routes is included in Chapter 12 traffic and transportation.

2.6.1.5 Building Construction Works

Once site preparation is completed, building construction and commissioning for construction and commissioning of each data storage facility will take up to 24 months with the total campus being developed based on client requirements over an estimated 7-year construction period.

Foundations and Structure

Following the completion of site preparation, all structures will require shallow spread foundations. The proposed depth of the excavations is anticipated to be 2-5m with piled foundations where required. Building structures will comprise structural steel frames with concrete floors on metal decks.

Cut and Fill

An estimate of the cut and fill requirement are as follows:

Table 2.2 *Cut and Fill*

	Volume (m^3)
Cut	107,376
Fill	211508
Net imported material (granular material, concrete, capping, asphalt, topsoil)	104,131

Much of the excavated material will be re-used for landscaping works. Infill materials for construction will comprise clean inert fill and capping material etc.

Waste Management during Construction

Chapter 14 contains a detailed description of waste management relating to construction of the proposed development. An outline construction and demolition

waste management plan is provided with planning. A more detailed Construction and Demolition Waste Management Plan will be prepared prior to construction by the contractor to ensure best practice is followed in the management of waste from the proposed development.

Power Supply

Power supply for the purposes of construction will be provided by a temporary grid feed of 10-15 MVA.

Roads, Services and Landscaping

The internal road system will initially be composed of hard cored material, rolled and compacted sufficiently to support initial construction including civil/structural sub grade works.

An early phase of landscape planting will be undertaken following the initial cut and filling works to include planting of trees in selected sensitive areas. Early growth and development in these areas will promote a good screening of construction works into operational phase.

Planting will be with native species and includes wild flower meadows to maximise opportunities for protecting biodiversity. There will be a loss of some existing hedgerows to facilitate development but the landscaping design will result in replacement of c. three times the existing extent of hedgerows. Details of the landscaping is provided In chapter 10

2.6.1.6 Construction Impacts and Mitigation Measures

Each of the following EIAR chapters (Chapters 3 to 15) include an assessment of the potential impact of construction works on the relevant aspects of the environment and set out the relevant mitigation measures relating to that aspects.

A detailed contractors Construction Environmental Management Plan (CEMP) will be put in place to ensure mitigation outlined in the CEMP and EIAR accompanying the application are implemented by the contractor during construction works. The CEMP will also include emergency response procedures in the event of a spill, leak, fire or other environmental incident related to construction. A copy of the CEMP is included with planning. The CEMP includes a Flood Risk Assessment, a surface water management and pollution prevention plan and a construction traffic management plan.

The primary potential impacts from construction which require mitigation are;

- Management of run-off water in terms of silt;
- Effects on the road network (due to construction workers and other staff attending site during preparation, construction and commissioning phases;
- Impacts on the flora and fauna of the site i.e. changes to site for construction resulting in loss of habitat, and;
- Impacts on human beings in terms of nuisances relating to the air quality of the environs due to dust and other particulate matter generated from excavation works and impacts on the noise environment due to plant and equipment involved in construction.

Mitigation measures to address potential impacts and are included in the CEMP and presented in each individual EIAR chapter.

2.6.2 Description of Commissioning

Once the physical structures are in place, specialist contractors will be mobilised to complete the commissioning of the data storage facility and energy centre. Commissioning is expected to take approximately 4 weeks per 4MW of IT Infrastructure. As the construction phase will be complete prior to commissioning, site construction staff will be demobilised.

2.6.3 Operation of the Project

The majority of this detail is provided in sections 2.3 to 2.5 above.

Once operational, each data storage facility will "go live" and serve data customers on an ongoing basis. The server systems and the supporting infrastructure will be monitored by site staff and faults identified and remedied as required. Staff are primarily required onsite for security, ongoing monitoring and maintenance of electrical equipment.

Vertical Farming

One of the primary outputs from the data centre buildings will be excess warm air which will be removed continually by motorised fans in the AHU system. All fans will have variable speed controls on fan motors. This warm air will be partially used to support the on-site vertical farm. The farm will generate 700 tonnes per year (13 per week) of products – mostly high value crops such as herbs.

Operational Hours and Employment

It is proposed that between 400- 450staff (and maintenance engineers) will be on site each day when the data centre and Energy Centre is fully operational. The vertical farm will have an additional 40 staff.

It is anticipated that the data centre facility will operate on 2 no. 12 hour shift basis (7am to 7pm, 7pm to 7am). Working hours are expected to be 24 hours a day, 7 days a week. The farm will operate on a single shift only.

Waste Generation

Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion into recycled products (e.g. paper mills and glass recycling). A more detailed description is provided in Chapter 14 Waste.

Chapter 14 contains a description of waste management relating to the proposed development. A detailed Operational Waste Management plan will be prepared in advance of the commencement of the activity at the site to ensure best practice is followed in the management of waste from the proposed development.

Noise Generation

Acoustic modelling has been undertaken to ensure compliance with noise guidelines. Mitigation is incorporated in the building structure (Chapter 10, Noise).

Emissions to Air

The Proposed Development (Data Centre and Energy Centre) will have a data centre with a total of 84 no. back-up generators with associated stacks which will be built to a height of 8 m above ground level. The energy centre will have 18 no. lean-burn natural gas engines, with the associated stacks built to a height of 25 m above ground level.

It is anticipated that the back-up diesel generators for the data storage buildings will rarely be used, however they will be maintained for emergency readiness by being tested once a month, two at a time sequentially i.e. each generator will be turned on once per month for one hour to maintain operational readiness when required waste exhaust gases will be vented to air via the stacks along the edge of the buildings. The diesel mode for the energy centre engines will also be tested. Each one will be turned on for a maximum of one hour, once per month.

Air dispersion modelling has been undertaken using the United States Environmental Protection Agency's regulated model AERMOD. The modelling of air emissions from the site was carried out to assess concentrations of pollutants at a variety of locations beyond the site boundary.

A number of modelling scenarios were investigated for the purposes of this assessment. Both normal day-to-day testing operations were considered as well as emergency operations. The assessment of the impact of these emissions and the modelling scenarios is presented in (Chapter 7 Air & Climate).

2.6.4 Changes to the Project (including Decommissioning)

It is intended that the proposed development will have a long lifespan. Regular maintenance and upgrading of the facility over time will enable it to continue to meet future demands.

Upon closure it is anticipated that the facility will be suitable for re-use or sold to a third party as would any other industrial site. All plant and equipment would simply be decommissioned, removed and recycled/disposed as appropriate.

At present, there are no changes anticipated to the proposed development over its expected lifetime.

2.6.5 Description of Other Related Projects

A list of the other developments in the vicinity of the Proposed Development is provided in Chapter 3 (Planning and Development Context) of this EIA Report. There are no identified significant projects which would result in a significant cumulative impact on the receiving environment

2.7 SUSTAINABILITY ENERGY EFFICIENCY & RESOURCE USE

The applicant is committed to running its business in the most environmentally friendly way possible. The proposed development has been designed to take into account these policies with energy efficiency central to the decision-making process,

minimising power and water consumption. The measures that are being proposed to reduce energy usage, promote a low carbon model and support sustainability are outlined in the Energy and Sustainability Statement prepared by Hurley Palmer Flatt and provided with planning. A summary is provided above in section 2.4

2.8 HEALTH AND SAFETY

2.8.1 Design and Construction Health and Safety

The facility has been designed in accordance with the Safety Health and Welfare at Act 2005 and the Health and Safety and Welfare at Work (General Application) Regulations SI 299 of 2007 and associated regulations.

The plant has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience.

2.8.2 General Operational Health and Safety

Prior to start up a comprehensive set of operational health and safety procedures will be established (based on those used at other similar facilities). This will ensure a smooth roll out of operations at the facility.

2.9 MAJOR ACCIDENTS/DISASTERS

The 2014 EIA Directive and associated Draft EPA EIA Guidelines requires that the vulnerability of the project to major accidents, and/or natural disasters (such as earthquakes, landslides, flooding, sea level rise etc.) is considered in the EIA Report. The site has been assessed in relation to the following external natural disasters; landslides, seismic activity and volcanic activity and sea level rise/flooding as outlined below. The potential for major accidents to occur at the facility has also been considered with reference to Seveso/COMAH.

Landslides, Seismic Activity and Volcanic Activity

There is a negligible risk of landslides occurring at the site and in the immediate vicinity due to the topography and soil profile of the site and surrounding areas. There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity. Further detail is provided in Chapter 6 Land, Soils, Geology & Hydrogeology.

Flooding/Sea Level Rise

The potential risk of flooding on the site was also assessed. A Stage 1 Flood Risk Assessment was carried out and it was concluded that the area proposed for the data centre development is not at risk of flooding. Furthermore, it is not expected that the proposed development would adversely impact on flood risk for other neighbouring properties. Further detail is provided in Chapter 7 Hydrology The Flood Risk Assessment provided with planning (Engineers Report).

Seveso/COMAH

The only substance stored on site controlled under Seveso/COMAH will be diesel for generators. The quantity of diesel which qualifies a given establishment for the

application of lower-tier and upper-tier requirements under Directive 2012/18/EU is 2,500t and 25,000t respectively.

The development is proposed to store less than 2500t of diesel at any time and therefore the facility will not be a Seveso/COMAH facility. The only substance stored on site controlled under Seveso/COMAH will be diesel for generators and the amounts proposed do not exceed the relevant thresholds of the Seveso directive. There are no SEVESO sites within the zone of Influence of the proposed development.

An Emergency Response Plan will be developed and implemented at the energy centre in consultation with local emergency services.

Minor Accidents/Leaks

There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction and operational phases. However, the implementation of the design and mitigation measures set out in Chapters 6 and 7 and the CEMP will ensure the risk of an accident is low and that the residual effect on the environment is imperceptible.

2.10 POTENTIAL IMPACTS OF THE DEVELOPMENT

The proposed data storage development is to be located on lands zoned for a datacentre development.

The development, when operational, will generate limited additional traffic, air, noise and water emissions, wastes generation from activities etc.

During construction, there is the potential for nuisance impacts from traffic, dust, and noise, if not carefully managed. The Applicant will require contractors to undertake works in compliance with a Construction Environmental Management Plan (CEMP) provided with planning to ensure each of these potential impacts are minimised. The CEMP will include mitigation measures included in this EIAR.

Each chapter of this EIA Report assesses the potential impact of the construction and operation of these developments on the receiving environment. Please refer to each specialist EIA Report chapter respectively

2.10.1 Residual Impacts

The residual impacts of the proposed development following the implementation of mitigation measures have been addressed in each of the chapters.

2.10.2 Do Nothing Scenario

Each of the chapters addresses the Do-Nothing scenario as required in the EPA 2017 guidelines. The Do-Nothing scenario is to retain the site as greenfield and also considers future development due to zoning.

2.11 RELATED DEVELOPMENT AND POTENTIAL CUMULATIVE IMPACTS

The proposed development is for six data storage facilities and single storey energy centre on a greenfield site. These will be built on a phased basis to meet customer

demand. On completion, the current site area will be fully built out. In each of the chapters, the impact of the entire planned development has been considered.

Cumulative impacts are those impacts that relate to incremental / additive impacts of the planned development in addition to historical, present or foreseeable future actions. Cumulative impacts can be considered as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

The EPA guidelines (2017) defines cumulative impacts as "*The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects".* The guidance is clear this assessment is required because a single activity can have a minor impact on its own, however, when combined with other impacts (minor or significant), it can have a cumulative impact that is collectively significant. It may also be relevant to consider the possible potential environmental loadings resulting from the development of zoned lands in the planned project's immediate vicinity.

European Union guidance (2017) states that *"It is important to consider effects not in isolation, but together; that is, cumulatively.*" Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from:

- *the interaction between all of the different Projects in the same area; and*
- *the interaction between the various impacts within a single Project*

Each specialist chapter considers the potential cumulative impact of the Proposed Development with the any future development (as far as practically possible) on the site and the cumulative impacts with developments in the locality (including planned and permitted developments). A list of the other developments considered is provided in Chapter 3 (Appendix 3.1) Planning and Development Context.

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 where 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 lifeline 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 31st 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 11th 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".

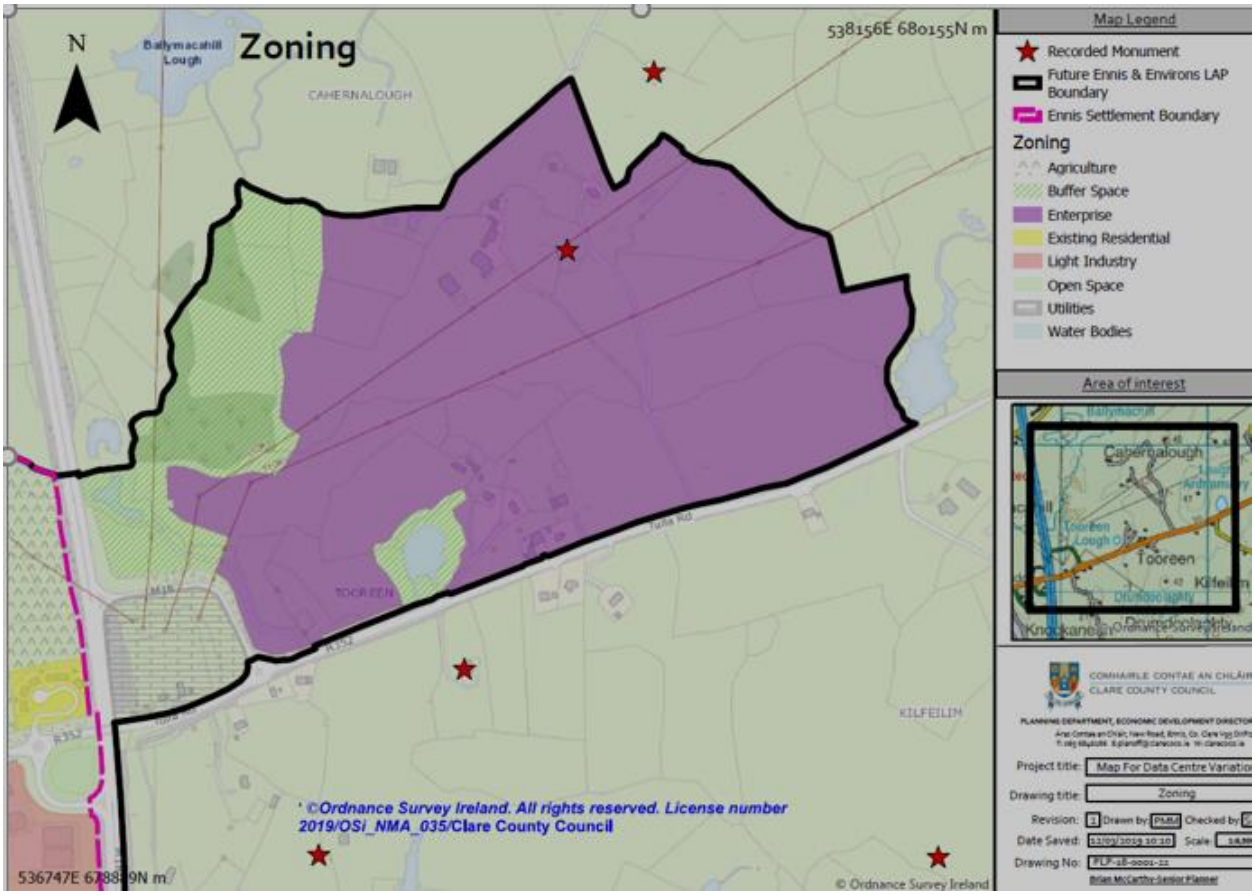


Figure 3.1 *Zoning Map showing the site of the Proposed Development zoned for Enterprise (purple) and buffer zones (hatched green) (Source: Clare County Development Plan 2017 – 2023 Variation 1 ; Maps Ennis Settlement Plan zoning map March 2019))*

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
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)

	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 . 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 (Biodiverstiy) 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. 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 Horseshow 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. 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. 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

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 01st through August 31st).	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 (Biodiversty) 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

CDP OBJ 17.3	Sustainable Developments 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 sting and design and promote the use of low carbon materials.
CDP OBJ 17.4	Design and Built Environment To encourage and facilitate excellence in the siting and design of new buildings in the county and particularly through contemporary and innovative architectural solutions; To encourage and facilitate high standards of energy efficiency; To facilitate and promote the use of appropriate low carbon materials in all future developments and embrace the principles of sustainable design; To run a Design Scheme to encourage excellence in the built environment.
CDP OBJ 18.3	Development of a Low Carbon Economy To promote County Clare as a Low Carbon County as a means of attracting Inward Investment to the County and Mid-West region; To facilitate measures to establish a low carbon economy and society by 2020; To facilitate the development of energy sources which will achieve low carbon outputs; To support sustainable modes of transport such as walking and cycling through promotional strategies and the provision of infrastructure where required; To work to Implement the provisions of *Ireland's Transition to a low carbon Energy Future 2015 – 2030* as they relate to County Clare.
CDP OBJ 18.4	Energy Efficiency To assist in reducing the County's dependence on imported fossil fuels and to develop a low carbon economy by; 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; 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; 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; Facilitating the provision of installations for powering the electric vehicles at convenient locations across the County

CDP OBJ 18.5	Distributed Heat 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; The increased use of heat generated from indigenous, low carbon, renewable resources (bioenergy, solar, geothermal etc.); The utilisation and distribution of useful waste heat from large thermal processes; 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.).

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 24th June 2020, 3rd March 2021 (site walkover),25th March 2021, 30th April 2021(consultation with CCC Water Services and Road Design), May 21st and June 8th 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.

3.6 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.

3.7 ALTERNATIVES

3.6.1 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.

3.6.2 Alternative Locations

Alternative locations have already been considered under the SEA completed for Variation No 1 (adopted March 2019), of the Clare County 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 11 and 12). Seven sites were subsequently 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. 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".

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.

3.6.3 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.

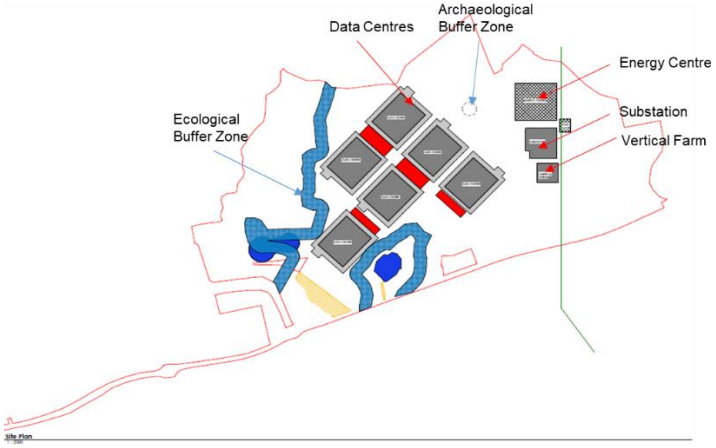


Figure 3.2 *Proposed Layout (Layout 1 –"the proposed layout")*

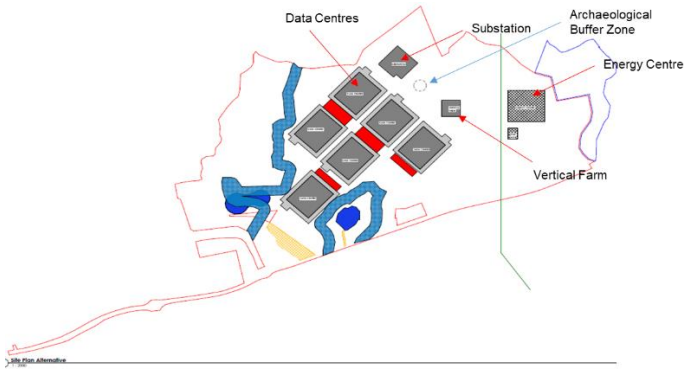


Figure 3.3 *Proposed Layout (Layout 2) Alternative location of Substation and Vertical farm*

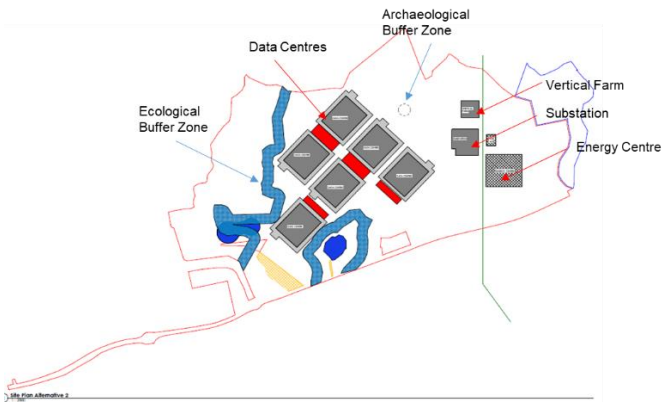


Figure 3.4 *Proposed Layout (Layout 3) Energy centre located further south than Option1 (Proposed Development)*

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 Chapter8 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.).

3.6.4 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_2 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_2 emissions have been addressed.

Energy Efficiency

A number of alternative energy efficiency measures have been considered to achieve overall CO_2 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 set out in the *Energy and Sustainability Statement* (section 4.6), a number of potential uses of waste heat have been considered.

- Combined Heat and Power (CHP) have been considered as unviable due to several limited reasons such as limited demand for hot water and space heating for offices and ancillary areas, distribution distances and unwanted heat losses etc.
- Connection to an area wide heat network. There is very little heating load and consequently limited requirement to receive heat from a District Heat Network. Given that there are no known exact locations selected for future district heating networks in the vicinity of the proposed development, and the limited heat demand on site in the data centre development itself. A connection to a district heat network is not excluded for the final design.
- However, the opportunity to export wase 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 NOx 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 NOx 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.

Pollutant/ Year	Averaging Period	Process Contribution NO_2 ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Predicted Environmental Concentration NO_2 ($\mu g/m^3$)	Limit Value ($\mu g/m^3$)	PEC as a % of Limit Value
NO_2 / 8 m stacks	Annual mean	22.7	14	36.7	40	92%
	99.8th%ile of 1-hr Means	111.5	28	139.5	200	70%
NO_2 / 12 m stacks	Annual mean	22.2	14	36.2	40	91%
	99.8th%ile of 1-hr Means	105.5	28	133.5	200	67%
NO_2 / 15 m stacks	Annual mean	21.9	14	35.9	40	90%
	99.8th%ile of 1-hr Means	103.2	28	131.2	200	66%
NO_2 / 20 m stacks	Annual mean	21.6	14	35.6	40	89%
	99.8th%ile of 1-hr Means	98.6	28	126.6	200	63%
NO_2 / 25 m stacks	Annual mean	21.2	14	35.2	40	88%
	99.8th%ile of 1-hr Means	92.5	28	120.5	200	60%
	99.8th%ile of 1-hr Means	20.8	14	34.8	40	87%
NO_2 / 30 m stacks	Annual mean	86.1	28	114.1	200	57%
	99.8th%ile of 1-hr Means	22.7	14	36.7	40	92%

Table 3.1 Assessment of alternative stack heights.

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.

APPENDIX 3.1

CLARE COUNTY COUNCIL PLANNING SEARCH (Planning permissions still under review or granted post 21st of April 2016, and

within 2km of the proposed site)

Planning Reference No., Applicant & Location	Development description	Decision & Decision Date
20158 / PL03.309568 J.J. Fahy Roslevan, Ennis, Co Clare	To construct 22 no. houses, to include the following: (a) 3 no. two-bedroom detached bungalows; (b) 4 no. blocks to include a total of 8 no. three - bedroom semi-detached houses; (c) 3 no. blocks of 3 no. terrace type houses to include 2 no. three bedroom and 1 no. four-bedroom house in each terrace (9 no. houses in total) (d) 2 no. three-bedroom detached houses. Connect to public foul sewer. Surface water to discharge to stream. Connect to public water supply, connect to public services (telephone and electricity). PERMISSION is also required to access the development via development previously granted under Planning Ref. 99/232 Previous permission granted on this site under Planning Ref No. 06/161	At the time of writing, a decision had not yet been published.
21153 Cormac Finn & Declan Finn Doire Mor, Knockaderry, Ennis, Co Clare	For a residential development comprising 21 no. two storey houses including; 3 no. detached four bedroom units, 8 no. detached four bedroom units, 8 no. semi detached four bedroom units, 4 no. semi detached three bedroom units, 6 terraced three bedroom units, modifications to front gardens (only) of the existing houses nos. 11-14 Doire Mor together with vehicular and pedestrian access and al associated site works and modifications to the existing stormwater outfall, form Doire Mor, to enable the stormwater discharges be re-directed to the existing public stormwater sewer on the Tulla Road,	Decision to grant by Clare County Council subject to conditions on 16th April 2021
2141 St Josephs Doora Barefield GAA Club Gurteen, Doora, Co Clare	To extend the existing Astro Turf playing pitches to include for an additional 40m x 25m Astro Turf pitch, metal posts and fencing to the perimeter of the new playing pitch, two additional lighting poles along with associated lights and all ancillary site works both above and below ground	Decision to grant by Clare County Council subject to conditions on 2nd March 2021
20172 Finn Homes Limited The Maples, Oakleigh Woods, Ennis, Co Clare	For development comprising 16 no. Semi-detached residential units, vehicular and pedestrian access to the proposed development via the Maples housing estate, and all associated site development works on lands at The Maples, Oakleigh Woods, Ennis, Co Clare. The proposed development is divided in two separate sites: A) Western site comprises the following: 2 no. 3 bedroom semi-detached houses, 4 no. 2 bedroom semi-detached houses, Domestic connections to existing watermain, Domestic connections to existing foul and surface sewer extension: B) Eastern site comprises the following: 6 no. 3 bedroom semi-detached houses, 4 no. 4 bedroom semi-detached houses, 50m new vehicular road extension of the existing "The Maples" road with footpath lanes, Watermain extension, Foul and surface sewer extensions, Domestic connections to watermain, foul and surface sewer extensions.	Decision to grant by Clare County Council subject to conditions on 20th January 2021
208006 Clare County Council Tulla Road, Roslevan, Ennis, Co Clare	Proposes to carry out the following development. The construction of a new housing estate development consisting of: a) 8 no. residential units comprising of: 5 No. 3-bedroom, two-storey semi-detached dwellings; 3 No. 2-bedroom single storey semi-detached dwellings; b) 17 ancillary car parking spaces within the development. c) The construction of vehicular and pedestrian access points to the site. d) Alterations to ground levels to accommodate the development. e) Varied boundary treatments and landscaping works. f) Surface water management will include hydrocarbon interceptor and soakaway. g) All ancillary site works. In accordance with the Habitats Directive, Appropriate Assessment Screening has been carried out on the project. An Environmental Impact Assessment (EIA) screening determination has been made	Decision to grant by Clare County Council subject to conditions on 12th October 2020

Planning Reference No., Applicant & Location	Development description	Decision & Decision Date
	and concludes that there is no real likelihood of significant effects on the environment arising from proposed development.	
20190 Datcha Construction Ltd Roslevan, Tulla Road, Ennis , Co Clare	For a residential development comprising 25 no. residential units (1 no. detached house, 2 no. 4 bedroom semi-detached houses, 6 no. 3 bedroom semi-detached houses, 6 no. 2 bedroom semi-detached houses, 2 no. blocks comprising a ground floor two bedroom apartment with a first floor one bedroom apartment over a semi-detached house and 1 no. block comprising a ground floor two bedroom apartment with a first floor one bedroom apartment over and two terrace houses), accessed via the Cluain Ros Leamhan development and all ancillary site development works. Ancillary site development works include a new connection to the public water main, foul and surface water drainage, access roads, footpaths, vehicle parking, landscaping, boundary treatments and site development works above and below ground	Decision to grant by Clare County Council subject to conditions on 30th June 2020
19961 Commissioners of Public Works on behalf of Dept. of Education & Skills Scoil Náisiúnta Cnoc an Ein, (Knockannean National School), Knockanean, Ennis, Co Clare V95FW42	The development will consist of the demolition of existing boundary walls, demolition of existing single storey six classroom school building of 685sq.m demolition of existing open shed of 25sq.m and demolition of prefabricated classroom building of 207 sq.m. The existing 4no. Classroom block constructed in 2011 with a gross floor area of 370sq.m will be retained and integrated into the new school. The new development consists of new two storey primary school building with a gross floor area of 1720sq.m. New accommodation consists of 8no. new Classrooms, a General Purpose Room and ancillary accommodation. In addition, site works include the replacement of the existing gated entrance with 2no. new gated vehicular and 2 no. new separate pedestrian entrance off the Knockanean Road boundary, serving 24 no. on site car parking spaces and associated set down areas, pedestrian pathways, together with 2 ball courts, play areas, a bin store, a bicycle shelter, gas tank enclosure, 3no. flagpoles, connection to existing foul drainage treatment system, separate surface water drainage, signage, landscaping and all associated site works on an overall site area oof 1.34 hectares. The building will be set back 63.285m from the Knockanean Road	Decision to Grant by Clare County Council subject to conditions on 23rd June 2020

Planning Reference No., Applicant & Location	Development description	Decision & Decision Date
19196 / PL03.306960 Datcha Construction Ltd Roslevan, Tulla Road, Ennis, Co. Clare	Development comprising 68 no. residential units, (1 no. detached house 18 no. semi-detached houses 41 no. terrace houses, 1 no apartment block (2 storey apartment block comprised of 8 no. 2 bedroom apartments) , accessed via Cluain Ros Leamhan development and all ancillary site development works on lands at Roslevan, Tulla Road, Ennis, Co Clare. Ancillary site development works include a new connection to the public water main, foul and surface water drainage, access roads, footpath, vehicle parking landscaping, boundary treatments and site development above and below ground.	Decision to grant by ABP subject to revised conditions on 26th November 2020.
1962 Cignal Infrastructure Ltd Roslevan Tld, Ennis, Co. Clare	To construct an 18 metre high multi-user monopole carrying telecommunications equipment, together with associated equipment and cabinets enclosed within a 2.4m palisade fence compound at Avenue United Football Club	Decision to grant by Clare County Council subject to conditions on 17th September 2019
19277 Tony Sheedy Knockasibbole, Doora, Co. Clare	To construct a new slatted unit and underground slurry storage tank and all associated site works	Decision to grant by Clare County Council subject to conditions on 31st May 2019

Planning Reference No., Applicant & Location	Development description	Decision & Decision Date
19244 Drumquin Construction Ltd Tulla Road, Roslevan, Ennis, Co Clare	To 1) RETAIN development consisting of (a) foundations for dwellings on sites 1,2,13,14,15,16,17,18,23,24,25 & 26. (b) Substructure works on sites 1,2,23,24,25 & 26 ; 2)Permission for development which will consist of the construction of 27 no dwelling houses as follows (a) 2 no. detached 2 storey dwelling houses with additional attic accommodation (b) 18 no. semi detached 2 storey dwelling houses (c) 4 semi detached no 2 storey dwelling houses with additional attic accommodation (d) 3 no detached bungalow (e) Ancillary site works and connection to services previously granted under P16-298.	Decision to grant by Clare County Council subject to conditions on 24th May 2019
18726 Cup Print Block F, Ballymaley Business Park, Gort Road, Ennis, Co. Clare	For development which will consist of the completion of a partially constructed light industrial/warehouse building granted under planning ref: 07-497 including all ancillary site works.	Decision to grant by Clare County Council subject to conditions on 30th January 2019
18137 Datcha Construction Ltd Roslevan, Tulla Road, Ennis, Co. Clare	To construct 25 no. dwelling houses consisting of the following: 3 no. Terraced Houses Type A, 8 no. Terraced Houses Type B, 6 no. Terraced Houses Type C, 8 no. Terraced Houses Type D. Connect to public water supply, connect to foul and surface water sewers and carry out all ancillary site works. Provide temporary road access to the vacant site within the " Cluain Ros Leamhan" development. Previous Planning permission ref. no. P04-200 refers.	Decision to grant by Clare County Council subject to conditions on 14th December 2018
18550 Cup Print Unit 2 & 3 Block B, Ballymaley Business Park, Gort Rd , Ennis	For development which will consist of alterations and an extension to an existing light industrial/warehouse building including all ancillary site works	Decision to grant by Clare County Council subject to conditions on 29th September 2018
18429 Michael Cullinan and Ciara O'Neill Knockaskibbole, Doora, Co. Clare	For development which will consist of the construction of a dwelling house, garage, a proprietary wastewater treatment system and ancillary site works	Decision to grant by Clare County Council subject to conditions on 25st September 2018
17960 James Carolan Knockanean, Tulla Road, Ennis, Co. Clare	For development which will consist of 9 No. two storey dwelling houses (which includes 4 No. with additional attic accommodation) ancillary site works and connection to public services	Decision to grant by Clare County Council subject to conditions on 12th September 2018
18285 Aine Clune	To construct a dwelling house and garage with effluent treatment system, new entrance from public road and with all associated site works.	Decision to grant by Clare County Council subject to conditions on 16th August 2018

Planning Reference No., Applicant & Location	Development description	Decision & Decision Date
Knockaskibbole, Doora, Co Clare		
188003 Clare County Council Newpark Road, Roslevan, Ennis, Co. Clare	For a proposed development which will consist of: 8 No. dwelling houses with access road, public lighting and associated ancillary site development works	Decision to grant by Clare County Council subject to conditions on 14th May 2018
17400 Gildoc Ltd Roslevan, Tulla Road, Ennis , Co Clare	To construct 14 no. dwelling houses consisting of 2 no. two-storey detached dwelling houses and 12 no. semi-detached dwelling houses including ancillary site works and connections to public services	Decision to grant by Clare County Council subject to conditions on 28th September 2017
17541 Gort Leamhán Residents Committee Gort Leamhán, Roslevan, Ennis, Co. Clare	To construct a temporary 1.2m high 30m long " bow top railing panel" type fence for a period of ten years	Decision to grant by Clare County Council subject to conditions on 31st August 2017
17326 Cup Print Unit 2 & 3 Block B, Ballymaley Business Park, Gort Rd , Ennis	To renovate and extend existing light industrial/warehouse Units 2 and 3, Block B and to RETAIN existing compressor room as built, and all associated site works	Decision to grant by Clare County Council subject to conditions on 26th July 2017
17330 Spancilhill Fair & Show Association Muckinish, Spancilhill, Ennis, Co. Clare	To construct amenity area at Spancilhill Cross	Decision to grant by Clare County Council subject to conditions on 23rd July 2017
16298 Drumquin Construction (Barefield) Tulla Road, Roslevan, Ennis, Co. Clare	For residential development for the re-design and to amend a current planning permission as granted under Planning Ref. Numbers P12-21041 and P06-21046. The development will consist of the following a) omission of 18 no. apartments, b) omission of 4 no. semi detached houses 24-27 inclusive, c) inclusion of 2 no detached houses, d) inclusion of 4 no 3 bedroom terraced houses and 2 no semi detached houses in lieu of 18 no apartments, e) minor changes including changes to elevations of 8 no dwellings to that previously indicated in this location of the development, f) provision of entrance roadway, connection to public services including ancillary and associated site works, f) phasing of development (total of 16 no dwellings for this applications)	Decision to grant by Clare County Council subject to conditions on 23rd December 2016

Planning Reference No., Applicant & Location	Development description	Decision & Decision Date
16428 Joe and Eoin Hennessey Cappamore, Barefield, Co. Clare	To construct a slatted unit with underground slurry storage tanks for housing livestock on the farm	Decision to grant by Clare County Council subject to conditions on 19th July 2016
168003 Clare County Council Ballybeg, Clonroadmore,, Lifford, Dulick, Ballymaley, Ballycorey, Cloghleagh, Clonroad Beg, Co. Clare	For the following proposed development: Ennis - R458 Active Travel Town (Clareabbey to Ballymaley) Works to encourage walking and cycling are proposed on parts of the R458 at 11 junctions on the R458, Club Bridge junction and Kelly's Corner as follows: 1. Improve the provision of cyclist infrastructure at junctions ie. traffic signals and roundabouts. 2. Provide on road cycle lanes/advisory cycle lanes where possible, 3. Enhance connectivity for cyclists into and through Ennis Town along the R458, part of the R352 and the R871 taking in access to schools along the route. 4. Enhance safety at junctions for cyclists and other road users. 5. Provide new cycle parking. 6. Provide directional, informational and distance signage along the route. 7. Enhance pedestrian facilities eg dropped kerbs at uncontrolled crossings. 8. Connect to R458 route to West Clare Railway Greenway at Mill Road and at Woodquay. 9. Provide an Active Travel Amenity Hub	Decision to grant by Clare County Council subject to conditions on 17th July 2016
16141 Eirgrid plc Knockanean Townland, Tulla Road, Ennis, Co. Clare	For the proposed extension of the existing battery/control room building within the compound of the existing Ennis 110 kV Substation. The Ennis 110 kV Substation is located in the townland of Knockanean on the Tulla Road in Ennis, Co. Clare. The development will consist of an extension to the existing battery/control room, the removal of a redundant telecommunications pole and all associated site works	Decision to Grant by Clare County Council subject to conditions on 7th April 2016
16215 Conor Fanning Tulla Road, Roslevan, Ennis, Co. Clare	To Extend the Appropriate Period of Planning Permission 10-88 for a single storey medical centre with community pharmacy	Decision to grant by Clare County Council on 16th March 2016

APPENDIX 3.2

CLARE COUNTY COUNCIL REGIONAL PLANNING SEARCH

PREPARED BY AWN CONSULTING LTD.

Planning Reference No., Applicant & Location.	Development Description	Decision & Decision Date.
20420 Roche Ireland Limited Clarehill Td, Clarecastle, Co Clare (c. 5.75km south-south-west of the site)	To apply for a 10 year planning Permission for development which will consist of the phased demolition of all existing buildings, structures and infrastructure on, in, over and under the site of the existing Roche pharmaceutical plant at Clarehill td, Clarecastle, County Clare, including the existing wastewater treatment plant (WWTP) and all associated ancillary infrastructure, with the exception of the ESB compound on Clarehill, the cottage to the north of the site which fronts onto Patrick Street, existing hedgerows and tree cover, all tie in points to utilities and to discharge points at the site boundary, and site boundary fencing. The existing security hut at the main entrance to the site from Clarehill, the existing internal road network, and existing site utilities; including storm water network, water supply network, fire watermain, fire pump house and electrical transformers, will remain for the duration of the proposed development, to be removed upon completion of the proposed development. The phased demolition will require a fenced demolition contractor's compound, to include offices, welfare facilities, material storage areas, bunded storage, and all associated ancillary structures. The demolition contractor's compound will be accessed via the existing entrance from Clarehill, to include a wheelwash and weighbridge. The proposed development will also consist of the phased remediation of three Areas of Environmental Concern (AECs) within the site boundary namely AEC1, the main processing area; AEC2 in the vicinity of the WWTP and the landfill area. The phased remediation will include bulk excavation within temporary negative pressure enclosures, including decontamination units, backfilling of excavated areas, the use of vapour and groundwater extraction wells, and a modular vacuum plant. The proposed development will also include a fenced remediation contractor's compound, contractor's car park, and a container storage area. The remediation contractor's compound will be accessed via the existing access to the south of Clarehill, with new temporary security hut, wheelwash and weighbridge. The proposed development will also generally consist of: stockpiling areas within the site; the construction of internal temporary fencing; silt fencing, temporary extension to the existing stormwater drainage, water supply and firewater supply systems; existing medium voltage supply at 10kV; Please view Newspaper or Site Notice for the remainder of description	Decision to grant by Clare County Council subject to conditions on 23rd December 2020
19988 Roche Ireland Limited Clarehill Td, Clarecastle, Co Clare (c. 5.75km south-south-west of the porposed site)	To erect a modular office building to facilitate workers during the site decommissioning and to carry out all associated ancillary works. This application refers to an Establishment which holds an Integrated Pollution Control Licence and to which the European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2006 applies	Decision to grant by Clare County Council subject to conditions on 18th February 2020

Planning Reference No., Applicant & Location.	Development Description	Decision & Decision Date.
18717/ PL03.305434 Amarenco Solar Ennistymon Ltd Ballingaddy East, Ennistymon, Co. Clare (c. 26.2km west-north-west of the proposed site)	For a 5MW solar farm comprising approximately 22,200 photo-voltaic panels on ground mounted frames within a site area of c. 11.8 hectares, 2 no. single storey delivery station, security fencing, CCTV, new road access on the Ballingaddy East Road (L5124) and all associated ancillary development works	Following an appeal, ABP granted permission subject to conditions on 21st January 2020
20318 The Electricity Supply Board (ESB) Moneypoint Generating Station, Carrowdotia North and Carrowdotia South, Kilimer, Co Clare (c. 43.3km South West of the proposed site)	For development on a c. 2.7 ha site located within Moneypoint Generating Station, Carrowdotia North and Carrowdotia South, Kilimer, County Clare (Eircode V15 R963) which is licensed by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence (Ref. P0605-04) and an Upper Tier COMAH site and therefore falls under the requirements of the Control of Major Accident Hazard Regulations(COMAH) Regulations, 2015. The development, which will be located within a fenced compound c. 0.4 ha, will consist of a up to 400 MVA (electrical rating) synchronous condenser which shares the existing 400 KV/17 kV transformer and 400kV underground cable belonging to the existing coal fired unit 2. The following plant will be included within the compound: (a) main building (c. 420sq.m., c. 15m high) to house equipment including the synchronous condenser, flywheel, lube oil skid, air compressor and pumps. (b) supporting items of plant including; cooling equipment (c. 690sq.m., c. 3m high); c. 7m high modular containers to house electrical and control equipment (total area of c. 384sq.m.); auxiliary transformer (c. 48sq.m., 7m high) and electrical plant including an external circuit breaker (c. 66sq.m., c. 9m high); connections to existing site services networks including electrical, water and wastewater and an underground surface water attenuation tank connecting to existing surface water drains. (c) all other ancillary and miscellaneous site works including site clearance, site access, internal roads and development of areas of hard standing including a maintenance laydown area. (d) the development will be bounded by a c. 3m high chainlink fence. Site access will be by means of a new c. 2.7 m high palisade gate accessed from a new internal road within the station site. PERMISSION is also sought to continue the use of the existing underground cable grid connection, including the 400kV/17kV transformer and 400 kV underground cable belonging to the existing coal fired Unit 2 for use by the synchronous condenser into the future. Planning PERMISSION is being sought for a duration of 10 years. This application represents a relocation within Moneypoint of a similar application permitted by Clare County Council under Reg. Ref. P19/746. A Natura Impact Statement (NIS) has been prepared and accompanies this planning application.	Decision to grant by Clare County Council subject to conditions on 16th July 2020
19746 The Electricity Supply Board (ESB) Moneypoint Generating Station,	For development on a c. 1.8 ha site located within Moneypoint Generating Station, Carrowdotia North and Carrowdotia South, Kilimer, County Clare (Eircode V15 R963) which is licenced by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence (Ref.P0605-04) and Upper Tier COMAH site and therefore falls under the requirements of the Control of Major Accident Hazard Regulations (COMAH) Regulations, 2015. The development, which will be located within a fenced	Decision to grant by Clare County Council subject to conditions on 20th November 2020

Planning Reference No., Applicant & Location.	Development Description	Decision & Decision Date.
Carrowdotia North, Kilimer , Co Clare (c. 43.3km South West of the proposed site)	compound c. 0.94 ha. will consist of a 300 to 400 MVA (electrical rating) synchronous condenser, including the following elements: a) a Generator and Flywheel building (c. 962 sq.m., c. 15m high) to house equipment including the generator, flywheel, lube oil skid, air compressor and pumps; b) supporting items of plant located within the compound including *cooling equipment (c. 690 sq.m., c. 3m high); *c. 7m high modular containers to house electrical and control equipment (total area of c. 384sq.m); *a generator step-up transformer (c.150 sq.m c. 8m high), auxilary transformer (c. 48 sq.m., 7m high) and electrical plant including an external circuit breaker (c 66 sq.m., c. 9m high); *fire fighting water tank (c. 7m dia., c. 8m high, pump house (c. 21 sq.m., c. 3m high); and * an above-ground oil separator and collection pit (c. 72sq.m.) connections to existing site services networks including electrical, water and wastewater and an underground surface water attenuation tank connecting to existing surface water drains; c) all other ancillary and miscellaneous site works including site clearance; site access, internal roads and development of areas of hard standing including a maintenance lay-down area; and d) the development will be bounded by a c. 3m high chainlink fence. Site access will be by means of a new c. 2.7 m high palisade gate accessed from existing roads within the station site. Planning Permission is being sought for a duration of 10 years.	
In January 2021, ESB and Equinor submitted a Foreshore License application to the Department of Housing, Local Government and Heritage. (application is not yet available) (c. 103km South West of the proposed site and 16km offshore)	Moneypoint Offshore Wind Farm is ESB and Equinor's flagship floating offshore wind development project proposed in Ireland. If developed, the project will be delivered in two phases. The first phase, Moneypoint Offshore One is located 16km off the Clare /Kerry Coast. The expected capacity from the first phase is estimated to be 400MW with the final windfarm area likely to be in the order of 70km2. The second phase, Moneypoint Offshore Two would be located a further 20km west of Moneypoint Offshore One, taking the total project capacity to between 1GW – 1.5GW. The latter phase would have a likely area of 200km2. The expected capacity output of the project as a whole, could provide enough energy to power up to 1.5 million homes. The grant of a Foreshore license will convey the right to undertake preliminary survey work and site investigation studies for what could be the location of the Moneypoint Offshore One Wind farm and its grid connection route. Such site investigation studies relate to the cable corridor, cable landfall areas, and the indicative location of the site respectively. The results of the proposed survey work, in conjunction with other desktop studies, will assist in determining the feasibility of developing an offshore wind farm at this location. Should the site be deemed suitable for an offshore windfarm, ESB and Equinor aim to seek planning permission for the project at the appropriate time under the terms of the Marine Planning and Development Management Bill which is due to be enacted in 2021.	Application has not yet been formally accepted by the department (Project Information (moneypointoffshorewind.ie)
178007	For a proposed development at Glór, Causeway Link, Ennis, Co. Clare which will consist of: Construction of an extension	Decision to grant by Clare County Council

Planning Reference No., Applicant & Location.	Development Description	Decision & Decision Date.
Clare County Council Causeway Link, Ennis, Co. Clare (c. 3km South west of the proposed development)	adjoining to the existing glór theatre building to provide a new public library, gallery space and associated office space. The proposed structure will range from one to three storeys in height with a floor area of 2320sqm. Landscaping, public realm works and ancillary works are also proposed as part of the development. External works include the relocation of the existing road entrance to the public area car park and modifications to the existing car park layout to provide 97 car parking spaces and service bays for deliveries	subject to conditions on 19th February 2018
19231 Valley Healthcare Fund Infrastructure Investment Fund ICAV Braids Mill, Station Road, Old Gaol Road, Ennis, Co. Clare (c. 3.7km South West of the proposed site)	For a mixed use development consisting of (I) demolition of existing warehouse buildings and associated structures on site, (ii) a four storey primary care health facility with associated roof plant and photovoltaic arrays comprising a maximum gross floor area of 7,020 sq.m; (iii) retail unit with a gross floor area of 115sq.m; (iv) café / coffee shop with a gross floor area of 115 sq.m; (v) on site car parking and bicycle provision; (vi) additional off site car parking to serve the development with public car park access outside of operating hours and at weekends; (vii) associated building signage; (viii) ESB Substation and Gas skid; (ix) landscaping and all ancillary signage; and (x) all associated site development works	Decision to grant by Clare County Council subject to conditions on 5th December 2019
21226 Philip Doyle Station Road and Old Gaol Road, Ennis, Co Clare (c. 3.8km South West of the proposed site)	For revisions and amendments to a permitted mixed use development (P19/231) currently under construction at Station and Old Gaol Road, Ennis, Co Clare. Planning PERMISSION is sought for (1) an increase in floor area of the four storey primary care health facility and ancillary commercial units from 7,250sqm to 8,008sqm with the provision of an additional floor set back at roof top level; and (2) provision of additional deck of car parking within the existing permitted car park area to provide for 63 no. car parking spaces. Amendment works include (i) Relocation of permitted plant store from roof level to the ground floor within the confines of the existing building footprint; (ii) Provision of a fifth floor set back at roof top level with ancillary roof plant; (iii) Removal of permitted PV panels form roof level; (iv) Modification to the layout of permitted car park to reduce car parking from 62 no. to 57 no. spaces and provision of additional deck of car parking accommodating 63 no spaces; (v) Provision of additional bicycle parking spaces; and (vi) all associated site development works. RETENTION permission is sought for (a) Internal relocation of permitted lift shaft extending from ground floor to roof level (b) Minor changes to window and door treatment on the western and eastern facades; and (c) Relocation of permitted external ESB substation and switchroom within the site	Decision due by Clare County Council on 9th of May 2021
20658 MCRE Windfarm Ltd (MCRE) Cahermurphy, Knokcnahila More South,	For the development of a windfarm in the townlands of Cahermurphy, Knocknahila More South, Carrownagry South, Caheraghacullin and Drummin, together with the development of an underground grid connection cable to the National Grid in the townlands of Cahermurphy, Drummin, Doolough, Glenmore, and Booltiagh. The development will consist of 1. Construction of up to 10 no. wind turbines with a maximum overall blade tip height of up to 170 metres and associated hard strand areas. 2. 1 no. permanent meteorological mast with a maximum height of up to 100 metres. 3. 1 no. 38kV permanent electrical substation which will be constructed at one of two possible locations on site: either Option A in Carrownagry South townland or Option B in	Application received by Clare County Council on 18th September 2020. Decision on hold pending further information

Planning Reference No., Applicant & Location.	Development Description	Decision & Decision Date.
Carrownagry South, Caheraghacullin, Drummin, Doolough, Glenmore & Booltiagh Co Clare (c. 30.2km west-south-west of the proposed site)	Cahermurphy townland. The electrical substation will have 1 no. control building with welfare facilities, all associated electrical plant and equipment, security fencing, all associated underground cabling, waste water holding tank and all ancillary works. 4. All associated under-ground electrical and communications cabling connecting the turbines to the proposed on-site substation. 5. All works associated with the connection of the proposed wind farm to the national electricity grid via an underground cable to the existing Booltiagh 110kV substation. 6. Upgrade of existing tracks, roads and provision of new site access roads and hardstand areas. 7. Junction access road works. 8. 2 no. borrow pits. 9. 1 no. temporary construction compound. 10. Site Drainage. 11. Forestry Felling to facilitate construction and operation of the proposed development; and 12. All associated and ancillary site development works. The application is seeking a ten year planning permission and 30 year operational life from the date of commissioning of the wind farm. An Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) have been prepared in respect of the proposed development	
SC03.303105 Coillte Carrownagowan, Co. Clare (c. 24.2km east-south-east of the proposed site)	Application to ABP for Strategic development status for proposed wind farm of between 20 and 25 turbines with an approximate yield of 90 MW.	Approved for Strategic Development status by ABP on 1st of November 2019

4.0 HUMAN HEALTH AND POPULATION

4.1 INTRODUCTION

This chapter has been prepared to assess the likely impacts associated with Human Health and Population for the proposed development. In accordance with the *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017), *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015), and European Commission (EC)*, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (EU, 2017) this chapter has considered the *"existence, activities and health of people"* with respect to *"topics which are manifested in the environment such as employment and housing areas, amenities, extended infrastructure or resource utilisation and associated emissions"*.

- Population and Demographics;
- Socioeconomics;
- Population Health;
- Natural Resources;
- Tourism;
- Social Infrastructure;
- Health and Safety.

Impacts on humans from other issues such as natural hazards, soils, geology and hydrogeology, water, air quality, noise and vibration, traffic and landscape are discussed in their respective EIAR chapters:

- Chapter 6 - Soils, Geology and Hydrogeology;
- Chapter 7 –Hydrology;
- Chapter 9 –Air Quality and Climate;
- Chapter 10 –Noise and Vibration;
- Chapter 11 –Landscape and Visual Impact; and
- Chapter 13 – Traffic and Transportation.

Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross referenced in this chapter.

4.2 METHODOLOGY

As per Article 3 of Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU:

"*1. The environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*

(a) population and human health;

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape;

(e) the interaction between the factors referred to in points (a) to (d).

2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned."

A 2017 publication by the European Commission, *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*, considered that:

"*Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population*."

This chapter will follow these EC guidelines, and will examine the health effects relevant to the Proposed Development as they relate to a relevant, defined study area. The effects of the Proposed Development on the population and human health are analysed in compliance with the requirements of the EPA Draft EIA Report Guidelines 2017.

4.2.1 Assessment of Significance & Sensitivity

The assessment of significance of is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect.

Within any area, the sensitivity of individuals in a population will vary. As such, it would be neither representative of the population, nor a fair representation of the range of sensitivities in a population, were an overall sensitivity classification assigned to the population in question. As such, the precautionary principle has been adopted for this assessment, which assumes that the population within the study area is of a uniformly high sensitivity.

4.2.2 Magnitude of Impact

The magnitude of predicted impacts has been quantified in this assessment using the terms outlined in Table 4.1 below.

Table 4.1 *Description of magnitude of predicted impacts*

Magnitude	Description of Magnitude
High	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a major change to existing baseline conditions (adverse or beneficial)

Medium	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a moderate change to existing baseline conditions (adverse or beneficial)
Low	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a minor change to existing baseline conditions (adverse or beneficial)
Negligible	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would not result in change to existing baseline conditions at a population level, but may still result in an individual impact (adverse or beneficial)
No change	No change would occur as a result of the Proposed Development which would alter the exiting baseline conditions (adverse or beneficial)

4.2.3 Significance of Effects

The assessment of significance of effects in this assessment is a professional appraisal and has been based on the relationship between the magnitude of effects (Section 4.2.2) and the sensitivity of the receptor. Table 4.2 below provides a matrix on the measure of the significance of effects based on these parameters.

Table 4.2 *Matrix illustrating the significance of effects as determined by the relationship between the magnitude of impact and the sensitivity of receptors*

		Magnitude of Impact			
		Negligible	Low	Medium	High
Sensitivity of Receptor	Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Medium	Negligible or minor	Minor	Moderate	Moderate or major
	High	Minor	Minor or moderate	Moderate or major	Major

4.3 RECEIVING ENVIRONMENT

The Proposed Development is to be located on a primarily greenfield site (60 hectares) located on lands at Tooreen Ennis (Refer to Figure 1.1). The site includes areas of local environmental sensitivity and buffer zones have been incorporated in the Proposed Development to protect these habitats during construction and operation.

The area is primarily rural with a number of individual residents located along the surrounding roadways. The closest residents are along the southern boundary (R352).The M18 Motorway is located to the west of the site.

The surrounding area is described in further detail in Chapter 2 (Description of the Proposed Development).

4.4 EXISTING BASELINE CONDITIONS

The most recent census of population was carried out by the CSO on the 24th April 2016. The previous census was completed on the 10th of April 2011 and before that on 23rd April 2006. The census compiles data for the whole state as well as smaller individual areas including counties, cities, towns and electoral divisions. Taking into consideration the location of the Proposed Development, the census information on population, age profile, employment and social class, has been analysed in relation to the Clare County Council Region.

4.4.1 Population and Demographics

The latest census data shows that the population in the Clare County Council (CCC) area grew by only 1.3% between the years 2011 and 2016 compared with 3.8% nationally. Spancelhill, the electoral division (ED) for the site, saw a decline with a decrease of 0.8% (Table 4.1). Ennis Rural (ED), which is most significant population centre in the area grew the most by 2% and highlights the expansion of the town beyond the urban quarter. Projections for the national and the County populations are predicted to continue this trend of moderate to high population growth into the short-term future.

Table 4.1 *Population change at National, primary and secondary hinterland level from 2011 – 2016 (Source: www.cso.ie)*

Area	2011	2016	% Change 2011-2016
State	4,588,252	4,761,865	+ 3.8%
County Clare	117,196	118,817	+ 1.3%
Spancelhill (ED)	694	688	- 0.8%
Ennis Rural (ED)	17,359	17,709	+ 2%
Ennis Urban No. 1 - 4 (EDs)	4,965	4,962	- 0.06%

Age Profile

The age profile of the population in the area is an important parameter as it provides a good insight into the potential labour force, the demand for schools, amenities, other facilities and the future housing demand. Table 4.2 shows the age profiles Nationally and in Clare County for 2016.

Table 4.2 *Age profile at National and County level 2016 (Source: www.cso.ie)*

Area	0-14	15-24	25-44	45-64	65+	Total Persons
State	21%	12%	30%	24%	13%	4,761,865
County Clare	21.5%	11.5%	26.2%	26%	14.8%	118,817

This table shows that both Nationally and in the CCC area, the dominant age grouping is 25-44 at 30% and 26.2% of the total population, respectively, indicating a respectable young working age population in the area which is just below the national level. While older age groups 45-64 and 65+ are just above the national average.

The overall labour force population (15-64 age group) in CCC is 63.7% which is only 2.3% below the National level of 66%.

4.4.2 Socioeconomics

Employment

Table 4.3 presents the employment statistics in 2016 compared with 2011. The data shows that unemployment decreased significantly in the County, as well as nationally, reflecting the economic recovery in recent years.

Table 4.3 *Employment statistics Nationally and at County level in 2011 and 2016 (Source: www.cso.ie)*

	At Work	Looking for first regular job	Unemployed having lost or given up previous job	Total in labour force	% Unemployment
2011 Labour Force					
State	1,807,360	34,166	390,677	2,232,203	19
Clare County	45,606	737	9,805	91,115	11.6
2016 Labour Force					
State	2,006,641	31,434	265,962	2,304,037	12.9
Clare County	49,511	666	6,352	93,245	7.5

The 2016 census data shows that the majority of people in employment in the CCC area are in 'Managerial and Technical' employment (28.4%) with the least represented social class being 'Unskilled' workers at (3.3%).

At a local level, the dominant social class in the Spancelhill area is 'Managerial and technical' labour (39.2%) with 'Unskilled Workers' being the least representative (3.1%).

Education

Census data presenting the highest level of education completed by people living in the Spancelhill community and CCC is presented in Table 4.4. (*Note the table presents key milestone education levels and excludes lower secondary, technical or vocational qualification, advanced certificate/completed apprenticeship, higher certificate, ordinary bachelor degree/national diploma, Ph.D./higher or where information was not stated*).

Table 4.4 *Highest level of education completed locally and at County level in 2016 for key educational levels. (Source: www.cso.ie)*

Area	No formal education	Primary education	Upper secondary	Honours Bachelor's Degree, Professional qualification or both	Postgraduate Diploma or Degree	Total Persons
Spancelhill	0.6%	5.9%	19.4%	9.5%	10.4%	456
Clare County	1.4%	9.9%	20.3%	9.6%	7.8%	77,762

Labour Force Survey

The Labour Force Survey (LFS) is a large-scale, nationwide survey of households in Ireland carried out every three months. It generates labour force estimates which include the official measure of employment and unemployment for the state.

The results Nationally for Q4 2018 showed that there were 2,281,300 people employed in the State with 128,800 registered as unemployed. This represents a 2.3% increase in employment since the start of 2018 and an increase of 3.1% compared to the start of 2017 to Q4 in 2017.

In both Q4 2017 and 2018, the majority of people were employed in the wholesale and retail trade and repair of motor vehicles and motorcycles sectors, with industry, and human health and social work activities following closely.

Income

The below data, obtained from CSO Statbank (CIA01), demonstrate that the levels of total income per person County Clare are marginally lower than that within the State.

Table 4.5 *Total Income per Person (Euro) for Clare and the State (Source: CSO Statbank CIA01)*

	2010	2011	2012	2013	2014	2015
Clare County	23,743	22,347	22,926	22,086	22,275	23,386
State	24,840	24,596	25,273	24,910	25,388	26,698

A similar pattern of income distribution is observed in data on disposable income per person, where in the Clare County Local Authority district the disposable income per person was significantly lower than that of in the State in 2015.

Table 4.6 *Total Disposable Income per Person (Euro) for Clare and the State (Source: CSO Statbank CIA01)*

	2010	2011	2012	2013	2014	2015
Clare County	18,949	17,387	17,887	17,060	17,234	18,082
State	19,558	18,889	19,429	18,898	19,265	20,334

Deprivation

Deprivation in small areas is mapped using the Pobal HP Deprivation Index. This Index draws on data from censuses and combines three dimensions of relative affluence and deprivation: Demographic Profile, Social Class Composition and Labour Market Situation. Figure 4.1 below shows graphical representation of how the concepts of Demographic Growth, Social Class Composition and Labour Market Situation are measured by ten key socio-economic indicators from the Census of Population. In this EIA Report, the Relative Index Score is considered as the measure for deprivation, as these Relative Index Scores are rescaled such that the mean is 0 and standard deviation is 10 at each census wave. This allows for the provision of descriptive labels with the scores, which are grouped by standard deviation as seen in Table 4.7 below.

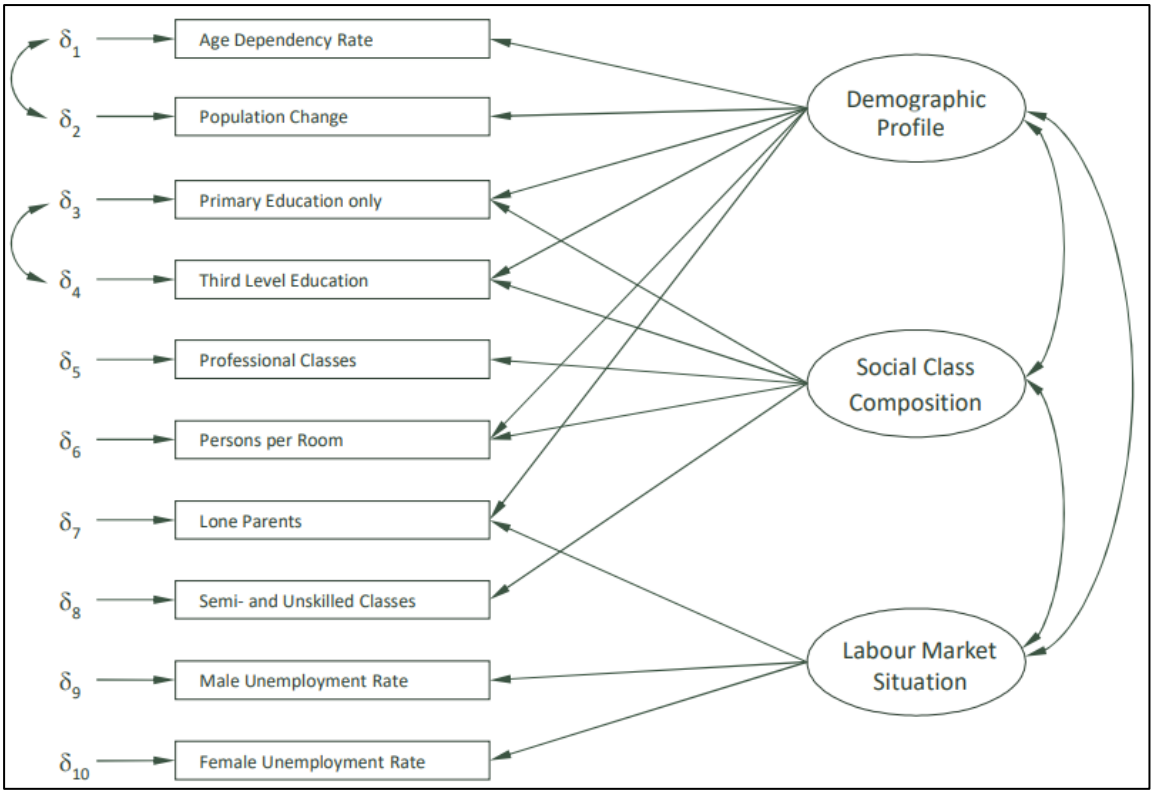


Figure 4.1 *Graphical representation of how the concepts of Demographic Growth, Social Class Composition and Labour Market Situation are measured by ten key socio-economic indicators from the Census of Population.*

Table 4.7 *Pobal HP Index Relevant Index Score labels (Source: Pobal HP Deprivation Index)*

Relative Index Score	Standard Deviation	Label
> 30	> 3	Extremely affluent
20 – 30	2 – 3	Very affluent
10 – 20	1 – 2	Affluent
0 – 10	0 – 1	Marginally above average
0 – -10	0 – -1	Marginally below average
-10 – -20	-1 – -2	Disadvantaged
-20 – -30	-2 – -3	Very disadvantaged
< -30	< -3	Extremely disadvantaged

The data in Table 4.8 show that the population living within the electoral division for the site, are generally classified as 'Marginally above average', with a Relative Index Score of 7.3

Table 4.8 *Pobal HP Index Relevant Index Score Figures at a local and County level (Source: Pobal HP Deprivation Index)*

	Relative Index Score	Pobal HP Description 2016
Clare County	-0.22	Marginally below average
Spancelhill (ED)	7.3	Marginally above average

4.4.3 Social Infrastructure

Residential Dwellings

The lands are currently used for agricultural purposes. The south and west of the site are bounded by the R352 (Tulla Road) and the M18 motorway. Ennis town and surrounding areas of urban fabric are located to the West, with small commercial and light industrial developments to the West and Northwest of the site. Agricultural land to the North, South and East are representative of the typical rural landscape in the area. The light industrial and commercial developments to the West comprise the Liffey mills, Hogan Motors, Breens Farm Machinery and Cummins Car centre/Dealership. Circle K, Topaz & O'Keeffes petrol stations, and O'Connors bakery and Liddys Eurospar shop which are located on the R352 west of the M18 overpass. The site is bound to the North and East by privately owned lands. The extent of these privately-owned lands are undeveloped farmlands and domestic properties. A halting site with 6 No. houses is located on the opposite side of the M18 motorway c. 200m West of the site.

Schools

There are a number of primary and secondary schools in the vicinity of the Proposed Development including:

- Knockanean National School in Knockanean, Ennis. c. 650m south of the site.
- An Daingin National School in Rosslevan c 1.5km West of the Site.

The closest third level institution in the area is Limerick Institute of Technology's Ennis campus located c. 3.5km to the southwest of the site.

Health

The nearest hospital to the site is Ennis General Hospital located c. 3.2km to the southwest of the site. The Ennis Medical Centre is also located c. 3.25 km southwest of the site along Francis street.

Security

There is a Garda station located on Abbey Street in Ennis c. 3.3km southwest of the site and a fire station on New road in Ennis (c. 2.9km to the southwest).

4.4.4 Landscape, Amenity and Tourism

In terms of landscape amenity of the Proposed Development site, there are no listed or scenic views, or tree preservation orders ~~protected trees~~ pertaining to the site, and no protected structures. The site is located within the 'Working Landscape' designation of the Clare County Development Plan 2017–2023 and outside of the 'Heritage Landscapes' designation. Working Landscapes are described in the Development Plan as…*intensively settled and developed areas within Settled Landscapes or areas with a unique natural resource*. There is also one Recorded Monument and Place (RMP) within the site, a 'Ringfort – Cashel' (SMR No. CL-034-007) in the northeast of the site as described in Chapter 12 Cultural Heritage and Archaeology of this EIA Report.

The primary areas of landscape amenity in the immediate vicinity of the Proposed Development site are located within the settlement of Ennis on the opposite side of the M18 motorway from the site. These are mainly small amenity greenspaces within the

various housing developments that comprise the settlement. The Oysterman's Marsh Natural Heritage Area (NHA) is located just over 5km away from the site.

The Landscape and Visual Impact Assessment (LVIA), Chapter 10 of this EIAR, did not identify any significant impacts upon the landscape or visual receptors as a result of the proposed development. As stated in Chapter 3, the lands are appropriately zoned in the Clare County Development Plan 2017–2023 Variation No.1 (11th March 2019) as ENT3 with the aim 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 buildings have been located within the landform in such a way as to minimise as far as possible any potential visual impact. Potential visual impacts have been further minimised by proposed berms and large extents of structure planting which will largely contain views of the proposed buildings to the area within the site. Further discussion is presented in Chapter 11 (Landscape and Visual).

Tourism is a major industry in the immediate environs of the Proposed Development site. The town of Ennis is seen as a gateway town to the west coast of Clare with attractions such as the Burren National Park and Cliffs of Moher accessible via a short drive. As a 'Gaelic medieval' town Ennis also hosts many significant historic features and attractions itself. Coupled with its narrow streets, collection of independent retailers, cafes, bars, landmark hotels, and a strong tradition of Irish Music the town has a lot to offer visitors as well as the surrounding communities.

The closest shopping centres include the Roslevan Shopping Centre c. 1.5km west-south-west of the site and the Ennis Shopping Centre c. 3km south west of the site. Several major hotels are located in Ennis town centre such as the 'Queens Hotel', 'Ashford Court' and 'Old Ground Hotel', as well as many other smaller accommodation providers located closer to the site such as 'Newpark House' located c. 1.6km west-south-west of the site.

4.4.5 Natural Resources

Natural resources and land use in the hinterland of the Proposed Development have also been considered as they may have implications for the development of the lands.

The site itself was previously in agricultural use. Historical Ordnance Survey (OS) maps indicate that much of the surrounding land has been in agricultural and fallow use for 20-30 years. The construction of the M18 motorway which was completed in 2007 is one development that has negatively impacted the natural resources of the surrounding area. Regardless of the M18, much of the agricultural resources in the surrounding area has been left intact over recent decades.

Data from the Geological Survey of Ireland indicates that there are no areas of geological heritage within the vicinity of the proposed site. In terms of extractive industries, the closest active quarries are the Quinn Limestone Quarry in Carrowmeer (c. 5.3km South of the site) and the Whelans Limestone Quarry at Fountain Cross (c. 6km west of the site). There are no anticipated impacts on these facilities from the Proposed Development. Further detail on extractive industries is presented in Chapter 5 (Land, Soils, Geology and Hydrogeology).

4.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The impact of construction, commissioning, operation and decommissioning of the Proposed Development are considered below.

4.5.1 Potential Impacts on Businesses and Residences

The main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIA Report as follows:

- Chapter 8– Air Quality and Climate
- Chapter 9 – Noise and Vibration
- Chapter 10 – Landscape and Visual Impact
- Chapter 11 – Traffic and Transportation

It is predicted that there will be a slight positive impact on local business activity during the construction phase with the increased presence of an average of 600 construction workers using local facilities with a peak construction number of 1,200 construction workers. The positive impact during the operational phase will be c. 400-450 employees and contractors anticipated for the datacentre and energy centre (staff will be present on a shift basis, numbers will vary throughout the day). The development of the on site vertical farm will generate employment of c. 40 staff.

During operation, there will be potential additional housing demand in the wider commuter area as a result of increased employment provided by the Proposed Development. It is also anticipated that the Proposed Development will have indirect positive effects on employment in terms of construction material manufacture, maintenance contracts, equipment supply, landscaping etc.

The potential increase in the temporary population of the area during construction as a result of the employment of workers from outside the wider Clare area that may choose to reside in the immediate and wider local area is likely to amount to only a small percentage of the workforce employed during the construction phase but will result in some additional trade for local accommodation and services. It is expected that the majority of the work force will travel from existing places of residence to the construction site rather than reside in the immediate environs of the site. However, some local employment from within the wider local area is expected.

Construction will have an indirect positive effect on support industries such as builder suppliers, construction material manufacture, maintenance contracts, equipment supply, landscaping and other local services. There will also be a need to bring in specialist workers on a regular basis that may increase the above estimated working population at times. Specialists are only likely to stay for shorter periods depending on the nature of the work. The construction phase therefore is considered to have the potential to have a moderate short to medium term positive impact on the economy and employment of the local and wider area.

The completed development will also have a positive impact in the provision of additional capacity in cloud computing and data storage, the demand for which remains high. The operator offers a broad set of global computer, storage, database, analytics, application and deployment services that help organisations (both locally, nationally and internationally) operate faster, lower ICT costs and scale applications. The

provision of these services will also improve individual's online experience and accessibility.

4.5.2 Potential Impacts on Human Health from Air Quality

As outlined in Chapter 8 of this EIA Report (Air Quality and Climate), National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are based on the protection of the environment as well as the protection of human health. Additional factors such as natural background levels, environmental conditions and socio-economic factors are also considered in the limit values which are set (see Chapter 8, Table 8.1). The ambient air quality standards established are designed to minimise harmful effects to health.

4.5.2.1 Construction Phase

As detailed in Chapter 8 (Air Quality & Climate), best practice mitigation measures are proposed for the construction phase of the Proposed Development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. The impact of construction and commissioning phase of the Proposed Development is likely to be *short-term* and *imperceptible* with respect to human health. Similar mitigation measures and impacts exist for decommissioning.

4.5.2.2 Operational Phase

As detailed in Chapter 8 (Air Quality & Climate), air dispersion modelling was undertaken to assess the impact of the Proposed Development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the dispersion modelling results, emissions from the site, assuming scheduled testing as well as emergency operation of the data centre back-up generators and the energy centre engines, are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health. Conservative assumptions were made when determining the input data for the air modelling assessment and the approach used in the study leads to an over-estimation of the actual levels that will arise. In relation to the spatial extent of air quality impacts from the site, ambient concentrations will decrease significantly with distance from the site boundary.

The stack heights for the proposed back-up generators have been modelled in an iterative fashion (i.e. with incremental increases in stack heights modelled) to ensure that an adequate height was selected to aid dispersion of the emissions and achieve compliance with the EU ambient air quality standards at all off-site locations (including background concentrations). Further details of the air dispersion modelling assessment can be found in Chapter 8. The impact of the operation phase of the Proposed Development is likely to be *long-term* and *imperceptible* with respect to human health.

4.5.3 Potential Impacts on Human Health from Noise & Vibration

Noise and vibration impacts associated with the Proposed Development have been fully considered within Chapter 9 of this EIA Report. Commentary on the impact

assessment and related noise levels are summarised below with respect to potential environmental health impacts.

4.5.3.1 *Construction Phase*

As detailed in Chapter 9 (Noise and Vibration), there will be some impact on nearby noise sensitive properties due to noise emissions from site activity and traffic. The application of noise limits and limits on the hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum. The noise impact is assessed to *be short-term* in duration with a *slight to moderate* significance considering the existing background low level of noise in this rural location. As reported, the noise impact will reduce to *slight* as construction moves above ground. Due to the distance between the site and the nearest sensitive locations, vibration impacts generated during construction are expected to be *short term* duration and *imperceptible* significance.

4.5.3.2 Operational Phase

As detailed in Chapter 9, noise modelling was undertaken to assess the impact of the Proposed Development of the site. As demonstrated by the modelling results, the predicted noise emissions associated with the Proposed Development of the site during the operational phases are within the relevant noise criteria considered suitable for the development considering the guidance outlined in EPA: *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016)*. These guidelines consider impacts on human health. As such the modelling has due consideration to human health, and has shown that although there will be an increase in noise as a result of the operation of the facility, this is not considered to have a significant impact on human health.

The Proposed Development will not generate any perceptible levels of vibration during operation and therefore there will be no impact from vibrations on human health.

4.5.4 Potential Impacts on Local Amenities and Tourism

In terms of landscape amenity of the Proposed Development site, there are no listed or scenic views, or protected trees pertaining to the site, and no protected structures. The site is located within the 'Working Landscape' designation of the Clare County Development Plan 2017–2023 and outside of the 'Heritage Landscapes' designation. Working Landscapes are described in the Development Plan as…*intensively settled and developed areas within Settled Landscapes or areas with a unique natural resource*. There is also one Site and Monument Record (SMR) within the site, a 'Ringfort – Cashel' (RMP No. CL-034-007) in the northeast of the site as described in Chapter 11 of this EIA Report.

The primary areas of landscape amenity in the immediate vicinity of the Proposed Development site are located within the settlement of Ennis on the opposite side of the M18 motorway from the site. These are mainly small amenity greenspaces within the various housing developments that comprise the settlement. The Oysterman's Marsh Natural Heritage Area (NHA) is located just over 5km away from the site.

The Proposed Development site is not considered to be significant or sensitive from a landscape and visual aspect. As stated in Chapter 3, the lands are appropriately zoned in the Clare County Development Plan 2017–2023 Variation No.1 (11th March 2019) as ENT3 with the aim 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 buildings have been located within the landform in such a way as to minimise as far as possible any potential visual impact. Potential visual impacts have been further minimised by proposed berms and large extents of structure planting which will largely contain views of the proposed buildings to the area within the site. Further discussion is presented in Chapter 11 (Landscape and Visual).

Tourism is not a major industry in the immediate environs of the Proposed Development site. As such it will have a negligible impact on tourism in the area.

4.5.5 Potential Impacts on Material Assets

The Proposed Development will require electrical power supply and gas supply from the national grid and the requirements for these supplies have been detailed in Chapter 14 (Material Assets) of this EIA Report.

4.5.6 Potential Impacts from Additional Traffic

An assessment of the additional traffic movements associated with the Proposed Development during the construction and operational phases is presented in Chapter 12 (Traffic and Transportation).

The increase in traffic volumes associated with the construction (see Section 12) and operational phases of development will not have any adverse transport-related environmental effects in terms of noise, air quality, vibrations, etc.

The traffic assessment shows that the additional traffic movements associated with the Proposed Development were found to be *short-term, negative* and *slight* for the construction phase and *long-term, negative* and *slight* for the operational phase.

The Stage 1 Road Safety Audit undertaken for the proposed development includes information on traffic collisions over the most recent 12 year period in the vicinity of the site. Based on the collision data analysis, it can be concluded that there are no accident black spots or notable accident patterns that would indicate a road safety design flaw on the road infrastructure surrounding the site. All minor issues identified in the Stage 1 Road Safety Audit relating to the infrastructure proposed as part of the development have been addressed.

4.5.7 Unplanned Events/Impacts on Health and Safety

The Proposed Development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (S.I. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. 299 of 2007) as amended and associated regulations. The plant has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience based on a number of similar existing facilities operated by the operator.

The Proposed Development has the potential for an impact on the health and safety of workers employed on the site, particularly during the construction phase. The activities of contractors during the construction phase will be carried out in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) as amended to minimise the likelihood of any impacts on worker's health and safety. The health and safety planning for the construction phase of the Proposed

Development will consider any appropriate measures to safeguard workers' health and safety with regards to Covid-19.

During the operational phase of the development, the operator will implement an Environmental Safety and Health (EH&S) Management System and associated procedures at the facility. Full training in the EH&S Management System and relevant procedures will be provided to all employees. The Operator will also implement any appropriate health and safety measures to safeguard workers' health and safety with regards to Covid-19.

The EIA Directive and associated EPA Guidance (2017) require that the vulnerability of the project to major accidents and/or natural disasters (such as earthquakes, landslides, flooding, sea level rise etc.) is considered in the EIA Report.

The site has been assessed in relation to the following external natural disasters; landslides, seismic activity, volcanic activity and sea level rise/flooding as outlined below. The potential for major accidents to occur at the facility has also been considered with reference to Seveso/Control of Major Accident Hazards (COMAH) Regulations.

There is a negligible risk of landslides occurring at the site and in the immediate vicinity due to the topography and soil profile of the site and surrounding areas. There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity.

The potential risk of flooding on the site was also assessed. A site-specific flood risk assessment was carried out by the project engineers, Clifton Scannell Emerson (CSEA) and localised flood zones have been identified relating to natural features on the site. These locations are within buffer zones proposed as part of the Proposed Development and will not impinge on any buildings or services. The Proposed Development design has adequate attenuation to ensure there is no potential impact on flood risk for other neighbouring properties. This is further discussed in Chapter 6 (Hydrology). The Proposed Development will not be a Seveso/COMAH facility. The only substance stored on site controlled under Seveso/COMAH will be diesel for generators and the amounts proposed do not exceed the relevant thresholds of the Seveso Directive. The Proposed Development site is not located within the consultation distance of any COMAH establishment that is notified to the HSA.

There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction and operational phases. However, the implementation of the mitigation measures set out in Chapter 5 (Land, Soils, Geology and Hydrogeology) and Chapter 6 (Hydrology) of the EIA Report and in the pollution prevention Plan outlined in the Construction environmental Management plan (CEMP) will ensure the risk of a minor/accident is low and that the residual effect on the environment is imperceptible.

4.6 REMEDIAL AND MITIGATION MEASURES

The impacts on the local population in terms of residents and businesses are considered to be mainly positive in the sense of creating direct employment opportunities and indirect additional business, both during the construction and operational phases.

Mitigation measures proposed to minimise the potential impacts on human health in terms of air quality and climate and noise and vibration are discussed in the relevant sections of Chapters 8 and 9, respectively.

Chapter 12 Traffic and Transportation addresses mitigation measures proposed to reduce the impact of additional traffic movements to and from the development.

Chapter 13 Material Assets addresses the impact of the Proposed Development on material assets and mitigation measures in place.

4.7 CUMULATIVE IMPACTS

Construction Phase

Due to the phasing of the project, there is a possibility that multiple developments in the area could run concurrently or overlap in the construction phase and contribute to additional impacts in terms of traffic, dust and noise. However, the mitigation measures highlighted above and included in the individual chapters of this EIAR along with the fact that any other significant construction project in the area would require an EIAR and consideration of the same/ similar mitigation measures would reduce the cumulative impact to receptors in the area. The construction phase of the proposed development together with any/all relevant other planned or permitted developments would have a positive impact in terms of employment. Contractors for the proposed development will be contractually required to operate in compliance with a project-specific Construction Environmental Management Plan (CEMP) which will include the mitigation measures outlined in this EIAR. It is considered that there would be no cumulative effects on human health.

The overall cumulative effect during construction is therefore concluded as *neutral imperceptible*, and *short-term* with respect to human health.

Operational Phase

The air, noise and traffic assessments indicate that the proposed development is not likely to result in significant adverse impacts either alone or in combination with any likely future projects. There are no significant cumulative impacts predicted for Human Health and Populations during the operational phase of the proposed development. The cumulative impact is predicted to be *long-term* and *imperceptible* with regards to human health.

4.8 RESIDUAL IMPACTS

It is expected that the Proposed Development will have a positive and long-term impact on the immediate hinterland through continued employment opportunities and the associated economic and social benefits.

There will be a loss of private agricultural land due to the Proposed Development but this land is zoned for development. As such there is no predicted adverse impacts with respect to socio-economic factors, land-use or the amenity value and tourism potential of the area.

All other environmental aspects relating to the human environment which have the potential to impact on the local population such as air quality and climate, noise and

vibration, traffic and material assets are addressed in Section 4.8 and in more detail in the relevant chapters of this EIA Report.

Measures outlined in Section 4.5.7 will be put in place to ensure the health and safety of all site personnel during both construction and operational phases.