Environmental Impact Assessment Report

Project: ART DATACENTRES – ENNIS CAMPUS

Data Storage & Energy Centre Facility and Substation Development

Prepared by: AWN Consulting, June 2022

Prepared for: ART Data Centres Limited

TABLE OF CONTENTS

NON-TECHNICAL SUMMARY

Environmental Impact Assessment Report

Project: ART DATACENTRES – ENNIS CAMPUS

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Volume 1 – Non-Technical Summary

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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.

As part of the Clarification for Further Information (CFI) response, May 2022, for the data storage facility application, the applicant is taking the opportunity to clarify the extent of the red line boundary for the electricity transmission development application to the ABP (due to the further development of the design of the electricity transmission development during the course of the planning process for the data storage facility development). The updates reflected in this update to the EIAR ensure consistency between the EIARs for both applications (both of which relate to parts of the same overall 'project' as set out above).

The following drawings present the project boundary for the EIA assessment and the redline boundaries for the data storage and energy centre facility application and the SID application.

Figure 1.1 The project boundary

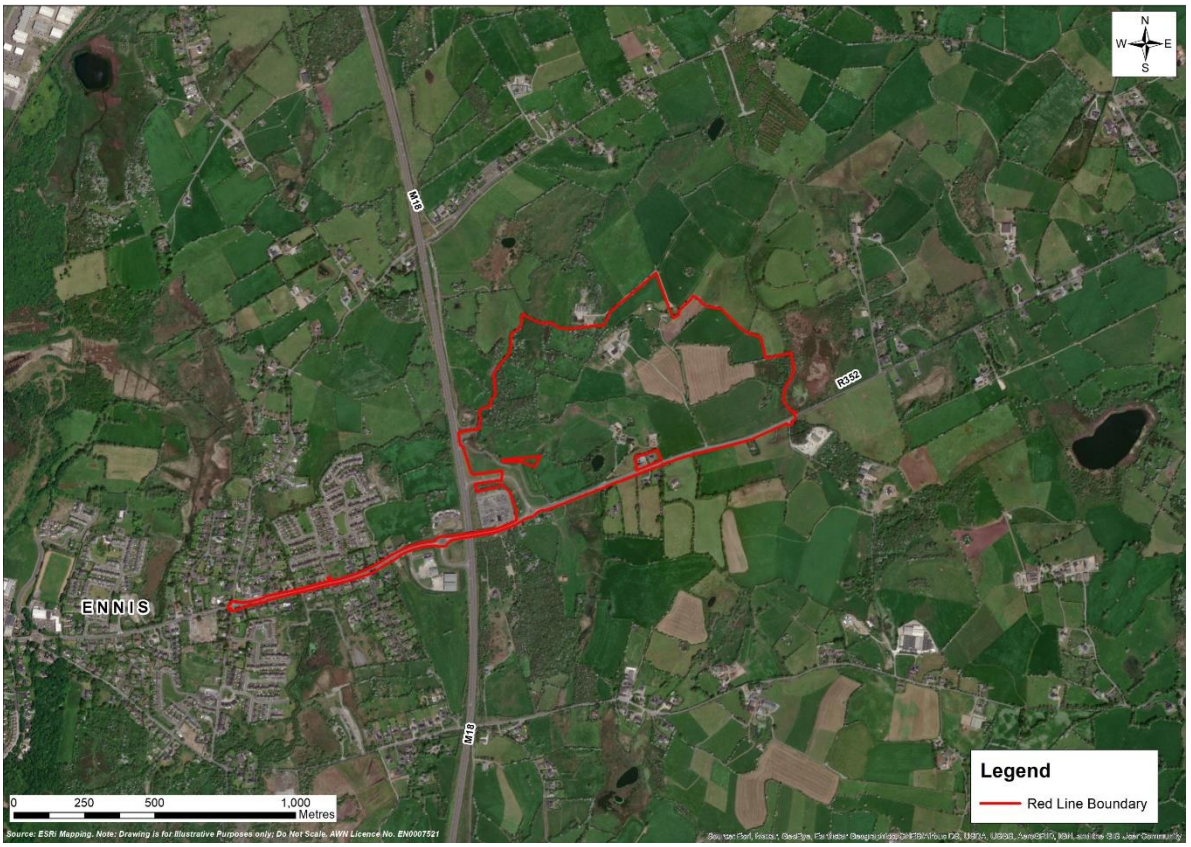

Figure 1.2 *The redline boundary for the data storage and energy centre facility application*

Figure 1.3 *The redline boundary for the SID application*

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.

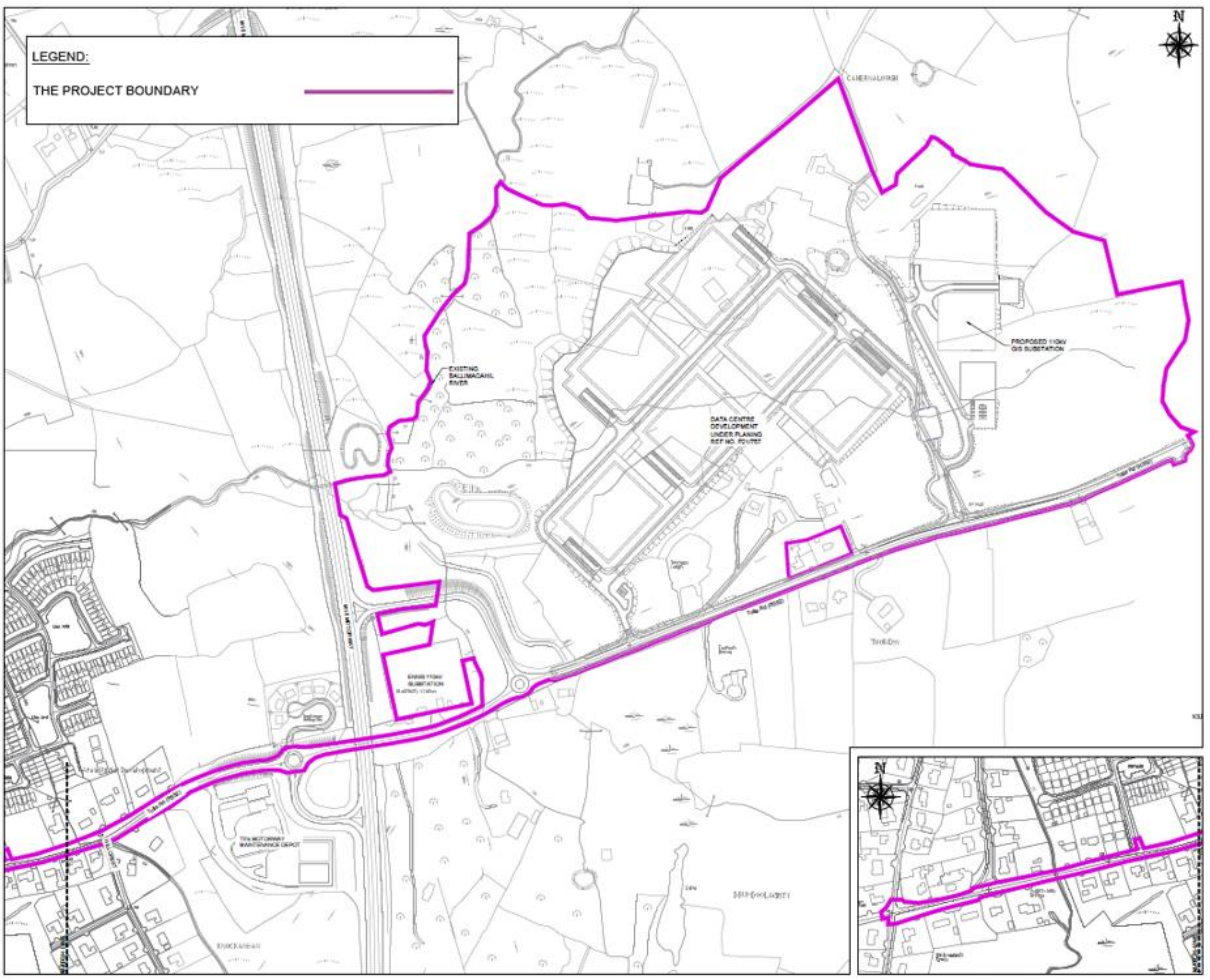

Figure 2.1 *Proposed layout.*

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.

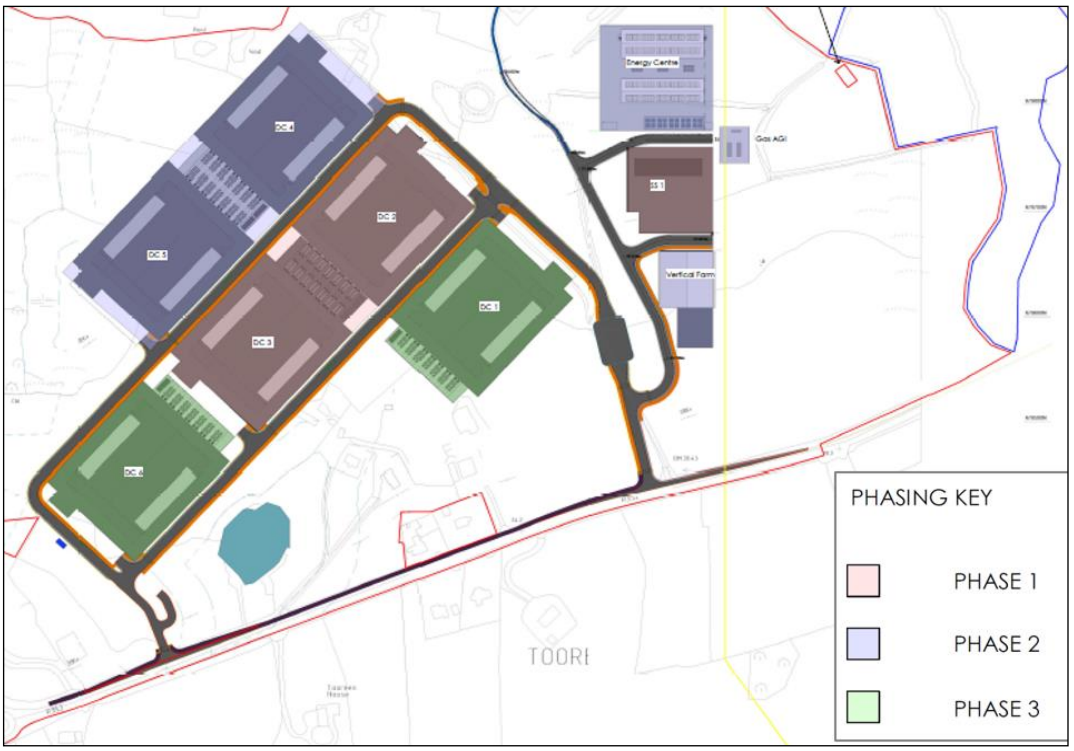

Figure 2.2 *Intended Construction Phasing for the proposed Masterplan (ART-ARC-SP-00-DR-A-0003).*

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".

In addition, the applicant has undertaken an assessment of alternative sites at a number of locations in Co. Clare. The assessment concluded that the sites are similar for most environmental considerations. However, primarily on the basis of material asset

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

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. 111,424 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. 135,600 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 15,900 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);
- 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).

[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.

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.

USEPA Methodology

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

<u>Construction phase</u>

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

Waste Type	Hazard Y/N	On-site Storage/Treatment Method (anticipated)	Method of Treatment or Disposal (offsite)
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.