14.0 WASTE MANAGEMENT

14.1 INTRODUCTION

This Chapter of the EIAR comprises an assessment of the likely impact of the proposed development from the waste generated from the development as well as identifying proposed mitigation measures to minimise any associated impacts.

A site-specific Construction and Demolition Waste Management Plan (C&D WMP) has been prepared by AWN Consulting Ltd to deal with waste generation during the demolition, excavation and construction phases of the proposed development and has been included as Appendix 14.1. The C&D WMP was prepared in accordance with the 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government in July 2006.

The Chapter has been prepared in accordance with EPA Guidelines on the Information to be contained in EIAR (2017, Draft)

These documents will ensure the sustainable management of wastes arising at the Development site in accordance with legislative requirements and best practice standards.

14.2 METHODOLOGY

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports. A summary of the documents reviewed, and the relevant legislation is provided in the C&D WMP provided in Appendix 14.1 and in sections 14.2.1 and 14.10 of this chapter.

This Chapter is based on the proposed development , as described in Chapter 2 (Description of the Proposed Development) and considers the following aspects:

- Legislative context;
- Construction phase (including demolition, site preparation and excavation);
- Operational phase; and
- Decommissioning Phase

A desktop study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 14.6

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 6 of this EIAR (Land, Soils, Geology and Hydrogeology).

14.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 14.1).

Figure 14.1: Waste Hierarchy (Source: European Commission)

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, *Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland*, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the

Irish and international waste context changing in the years since the launch of the previous waste management plan, *A Resource Opportunity,* in 2012. The need to embed climate action in all strands of public policy aligns with the goals of the European Green Deal.

The strategy for the management of waste from the construction phase is in line with the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*, published by the Department of Environment, Heritage and Local Government (DoEHLG) in 2006. The guidance document, *Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers* (FÁS & Construction Industry Federation, 2002), was also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the *Southern Region (SR) Waste Management Plan 2015 – 2021*, *BS 5906:2005 Waste Management in Buildings – Code of Practice*, the Clare County Council (CCC) County Clare Waste Management Bye-Laws 2018, the EPA National Waste Database Reports 1998 – 2018 and the EPA National Waste Statistics Web Resource.

14.2.2 Terminology

Note that the terminology used herein is generally consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
b) the adverse impacts of the generated waste on the environment and human health; or
c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes

the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

14.3 RECEIVING ENVIRONMENT

The proposed development includes 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.

In terms of waste management, the receiving environment is largely defined by CCC as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *Southern Region (SR) Waste Management Plan 2015 – 2021*, which sets out the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Plan sets a specific target for C&D waste of "*70% preparing for reuse, recycling and other recovery of construction and demolition waste*" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

The National Waste Statistics update published by the EPA in August 2020 identifies that Ireland's current progress against this C&D waste target is at 77% and our progress against 'Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)' is at 51%. Both of these targets are required to be met by 12 December 2020 in accordance with the requirements of the Waste Framework Directive; however, the EPA are yet to confirm that these were met.

The Clare County Development Plan 2017 – 2023 also sets policies and objectives for the CCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, CCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the Southern Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

There is a number of licensed, permitted and registered waste facilities in the Clare region and in the surrounding counties. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably

placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity, serviceability, and cost. Potential waste facilities have been identified in in section 14.3.1 and section 14.3.2.

14.3.1 Current C&D Waste Disposal / Recovery Routes

During the planning phase and prior to the appointment of waste contractors, waste destinations for C&D Waste cannot be supplied. These details are to be finally determined prior to demolition and construction beginning. Waste facilities have capacity and life span limitations that may not be available at the of construction & demolition phases of the development.

As well as EPA licensed facilities, there are currently a number of facilities in Clare and the counties surrounding the proposed Project in possession of a Waste Facility Permit or Certificate of Registration from the applicable County Councils which accept soils and inert waste from construction and demolition works. These facilities are all permitted or certified to operate Class 5, Class 6, and/or Class 7 waste activities as described in the Third Schedule of the Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821/2007).

The currently licensed or permitted facilities which can operate under these classes of activity and are closest to the proposed development are listed in Table 14.1. There are also registered sites that can receive waste from the development that are not included in the table due to their lower capacity limits, however they can still potentially be used by the yet to be selected waste contractor. All details were collected from the National Waste Collection Permit Office and Environmental Protection Agency websites (July 2021) and a full list of licensed, permitted and register sites can be found on the registers contained on these sites.

***Table 14.1**: Potential destinations for Construction & Demolition Waste*

Facility / Applicant Name	Licence Number & Facility Type	Location
Potential Soil Recovery Facilities		
Tulligmore Quarry Solutions Limited	W0255-02	Tulligmore Quarry Solutions Limited, Tulligmore, Dripsey, Cork.
Lennon Quarries Limited	W0272-02	Lennon Quarries Limited, Tallagh, Belmullet, Mayo.
Mallow Contracts Limited	W0266-01	Mallow Contracts Limited, Lissard & Ballyhilloge, Mourneabbey, Co. Cork, Cork.
Potential Permitted Waste Facilities for Soil		
Cloonaughter Parteen Co Clare	WFP-CE-17-0001-01	Cloonaughter Parteen Co Clare
Clare Waste & Recycling Co. Ltd	WFP-CE-08-0002-03	Raheen Tuamgraney Co. Clare V94 WY67
Jim Bolton Sand and Gravel Ltd	WFP-CE-19-0001-01	Faheymore O'Briens Bridge Co Clare V94 F635
Kieran Kelly Haulage Ltd	WFP-CE-19-0002-01	Ballynacragga Newmarket-on-Fergus Co Clare
Lymar Contracts Ltd.	WFP-CE-20-0002-01	Caherea Lissycasey Ennis Co Clare
Potential Permitted Waste Facilities for Demolition and Construction Waste		
Clare Waste & Recycling Co. Ltd	WFP-CE-08-0002-03	Raheen Tuamgraney Co. Clare V94 WY67

Facility / Applicant Name	Licence Number & Facility Type	Location
Clean (Irl) Refuse & Recycling Company	WFP-CE-08-0003-03	Smithstown Industrial Estate Shannon Co Clare V14 HP89
Potential Waste Facilities Hazardous Waste		
Enva Ireland Limited	W0145-02	Enva Ireland Limited (Cork), Unit 9, Raffeen Industrial Estate, Raffeen, Monkstown, Cork.

14.3.2 Current Operational Waste Disposal / Recovery Routes

During the planning phase and prior to the appointment of operational phase waste contractors, waste destinations for the Operational Phase Waste cannot be supplied. These details will be finally determined prior to the operational phase beginning. Waste facilities have capacity and life span limitations that may change throughout the life of the operational phase of the development that cannot be controlled. There will be other operational limitations such as cost and serviceability capabilities of provider that will not be known until the waste contractor selection process is undertaken in the detailed design phase or prior to occupation of the development.

As well as EPA licensed facilities, there are currently a number of facilities in Clare and the counties surrounding the development in possession of a Waste Facility Permit or Certificate of Registration from the applicable County Councils which accept the same types commercial and municipal waste.

The currently licensed or permitted facilities which are closest to the proposed development are listed in Table 14.2. There are also registered sites that can receive waste from the development that are not included due to their lower capacities however they can still potentially be used by the waste contractor. All details were collected from the National Waste Collection Permit and Environmental Protection Agency website (July 2021) and a full list of licensed, permitted and register sites can be found on their registers.

Table 14.2: *Potential destinations for Operational Waste*

Facility / Applicant Name	Licence Number & Facility Type	Location
Potential Waste Facilities (Transfer Stations) for Operational Waste		
Starrus Eco Holdings Limited	W0058-01	Starrus Eco Holdings Limited (Sligo), Deepwater Quay, Sligo, Sligo.
Mr Binman Limited	W0061-01	Mr Binman Ltd, Luddenmore, Grange, Kilmallock, Limerick.
Bruscar Bhearna Teoranta	W0106-02	Bruscar Bhearna Teoranta (Carrowbrowne), Carrowbrowne, Headford Road, Galway, Galway.
The City Bin Co.	W0148-01	City Bin Co Ltd, Townlands of Carrowmoneash, Oranmore, Galway.
Potential Permitted Waste Facilities for Operational Waste		
Clare Waste & Recycling Co. Ltd	WFP-CE-08-0002-03	Raheen Tuamgraney Co. Clare V94 WY67
Clean (Irl) Refuse & Recycling Company	WFP-CE-08-0003-03	Smithstown Industrial Estate Shannon Co Clare V14 HP89

14.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A full description of the proposed development can be found in Chapter 2 (Description of the Proposed Development). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

14.4.1 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.

Further detail on the waste materials likely to be generated during the demolition works are presented in the project-specific C&D WMP in Appendix 14.3. The C&D WMP provides an estimate of the main waste types likely to be generated during the C&D phase of the proposed development . The reuse, recycling / recovery and disposal rates have been estimated using the EPA National Waste Reports and these are summarised in Table 14.3.

Table 14.3 *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**

14.4.2 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.

There will also be soil, stones, clay and made ground excavated to facilitate construction of new foundations, underground services, and the installation of the proposed basements. The development engineers (Clifton Scannell Emerson Associates Consulting Engineers) have estimated that c. 111,424 m^3 of material will need to be excavated to do so. It is currently envisaged that all of the excavated material will be able to be retained and reused onsite for landscaping and fill. These estimates will be refined prior to commencement of construction.

If the material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste

Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011). For more information in relation to the envisaged management of by-products, refer to the C&D WMP (Appendix 14.1).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2019). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D WMP (Appendix 14.1). 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 14.4.

***Table 14.4**: 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	310.1	10	31.0	80	248.1	10	31.0
Timber	263.2	40	105.3	55	144.7	5	13.2
Plasterboard	94.0	30	28.2	60	56.4	10	9.4
Metals	75.2	5	3.8	90	67.7	5	3.8
Concrete	56.4	30	16.9	65	36.7	5	2.8
Other	141.0	20	28.2	60	84.6	20	28.2
Total	**939.8**		**213.3**		**638.1**		**88.3**

14.4.3 Operational Phase

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*. Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the Proposed development are summarised below.

Segregation of Waste Materials Onsite

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site.

Table 14.5 below summarises the anticipated management strategy to be used for typical wastes to be generated at the data storage facilities and the estimated waste to be generated.

Table 14.5 Anticipated Onsite Waste Management and Estimated Average Quantities

Waste Type	Hazard Y/N	On-site Storage/Treatment Method (anticipated)	Method of Treatment or Disposal (offsite)	Waste Volume (kg / week)
Packaging Waste	N	Segregated bins/skips	Recycle	165.0
Office Waste	N	Segregated bins/skips	Recycle	80.0
General Non-Hazardous Waste	N	Segregated bins/skips	Recovery	172.5
Empty Containers	N	Segregated bins/skips	Disposal to landfill	40.0
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	37.5
Non-hazardous WEEE	N	Segregated bins for waste electric and electronic equipment	Recovery	60.0
Landscaping waste	N	Composting bins	Composting	20.0
Vertical Farm	N	Segregated bins/skips	Compost organic waste. Recycle mixed dry recyclable waste. Recovery of other general waste	3,300.0
Waste Oil	Y	Oil drum in external waste storage area	Recovery	5.0
Waste sludge from oil separator	Y	Storage tank connected to oil separator	Recovery or disposal	5.0
(Wet) Batteries	Y	Specialised container in waste storage area	Return to supplier	20.0
(Dry) Batteries	Y	Specialised container in waste storage area	Recovery	20.0

Hazardous Waste

Hazardous waste may be generated from batteries, contaminated chemical drums and other packaging. If the packaging contains residues of or if it is contaminated by dangerous substances, it may be classed as a hazardous waste (depending on the volume and concentration of contaminants). If the drums are found to be unsuitable for re-use, they will be classed as a waste. Any waste classed as hazardous will be stored in a designated area (suitably bunded, where required) and will be removed off site by a licensed hazardous waste contractor(s).

Waste sludge from the petrol interceptors will be pumped out/removed as required by a suitably permitted/licenced contractor.

14.4.4 Decommissioning Phase

The Proposed Development may be decommissioned at some stage in the future. At that time, a demolition or refurbishment plan will be formulated for the decommissioning phase of the Proposed Development to ensure no waste nuisance occurs at nearby sensitive receptors.

14.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section details the potential waste effects associated with the proposed development .

14.5.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site demolition, excavation and construction. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with the European Union, regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *long-term, significant*** and ***negative***.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the Southern Region (SR) which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region and within Ireland. The majority of construction materials are either recyclable or recoverable. However, in the absence

of mitigation, the effect on the local and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 5 (Land, Soils, Geology, and Hydrogeology). It is not anticipated excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

14.5.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *long-term, significant*** and ***negative***.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. 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 in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

Waste contractors will be required to service the proposed development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *long-term, significant*** and ***negative***.

14.5.3 Decommissioning Phase

The greatest potential impact on waste during the decommissioning phase of the Proposed Development would be if the building waste to be demolished or refurbished.

The decommissioning of the proposed development will generate a range of non-hazardous and hazardous waste materials during site demolition / refurbishment. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to

lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with the European Union, regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *long-term, significant*** and ***negative***.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the Southern Region (SR) which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region and within Ireland. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

14.5.4 Do Nothing Scenario

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no demolition, excavation or construction or operational waste generated at this Site. There would, therefore, be a neutral effect on the environment in terms of waste.

14.6 REMEDIAL AND MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

14.6.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development :

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG, 2006), and is included as Appendix 14.1. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and construction phases of the proposed development .

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the C&D WMP (Appendix 14.1) in agreement with CCC, or submit an addendum to the C&D WMP to CCC, detailing specific measures to minimise

waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will be required to fully implement the C&D WMP throughout the duration of the proposed construction and demolition phases.

A quantity of topsoil, sub soil, clay and made ground will need to be excavated to facilitate the proposed development. Project Engineers have estimated that excavated material will not need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Waste Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition, excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Article 27 will be used.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, and the SR Waste Management Plan 2015 – 2021. It will also

ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

14.6.2 Operational Phase

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins, skips or other suitable receptacles in a designated, easily accessible areas of the site.

The Operator / Buildings Manager of the Site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of the below mitigation measures, ensuring a high level of recycling, reuse and recovery at the Site of the proposed development.

The following mitigation measures will be implemented:

- The Operator / Buildings Manager will ensure on-Site segregation of all waste materials into appropriate categories, including (but not limited to):
  - Organic waste including Vertical Farm organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste Oil;
  - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
  - Batteries (non-hazardous and hazardous);
  - Light bulbs; and
  - Cleaning and Farming chemicals (pesticides, paints, adhesives, resins, detergents, etc.).
- The Operator / Buildings Manager will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The Operator / Buildings Manager will ensure that all waste collected from the Site of the proposed development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The Operator / Buildings Manager will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the proposed development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, *the Litter Pollution Act 1997*, the *SR Waste Management Plan 2015 – 2021* and the CCC Waste Management Bye-Laws 2018. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

14.6.3 Decommissioning Phase

The following mitigation measures will be implemented during the decommissioning of the proposed development:

- Prior to commencement, the appointed Contractor(s) will be required to prepare a Demolition or Refurbishment Waste Management Plan (DR WMP) in

agreement with CCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.

- The Contractor will be required to fully implement the DR WMP throughout the duration of the decommissioning.

In addition, the following mitigation measures will be implemented:

- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Waste Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition / refurbishment works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities;
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

14.7 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

14.7.1 Construction Phase

A carefully planned approach to waste management as set out in Section 14.6.1 and adherence to the C&D WMP (Appendix 14.1) during the construction phase will ensure that the predicted effect on the environment will be ***short-term, imperceptible*** **and** ***neutral.***

14.7.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 14.6.2 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be ***long-term, imperceptible and neutral.***

14.7.3 Decommissioning Phase

A carefully planned approach to waste management as set out in Section 14.6.3 and adherence to a DR WMP during the demolition / refurbishment phase will ensure that

the predicted effect on the environment will be ***short-term, imperceptible*** **and** ***neutral.***

14.7.4 Conclusion

Assuming the full and proper implementation of the mitigation measures set out herein and, in the C&D WMP (Appendix 14.1), no likely significant negative effects are predicted to occur as a result of the construction or operational of the proposed development.

14.8 RESIDUAL IMPACTS

The implementation of the mitigation measures outlined in Section 14.6 will ensure that high rates of reuse, recovery and recycling are achieved at the Site of the proposed development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

14.9 CUMULATIVE IMPACT ASSESSMENT

The following considers the cumulative impacts of the proposed development along with permitted and operating facilities in the surrounding area in relation to Material Assets Waste Management.

14.9.1 Construction Phase

Multiple permissions remain in place (see Chapter 3 Planning and Alternatives for list) for both residential and commercial developments within the vicinity of the proposed development. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase. Due to the high number of waste contractors in the Clare region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be ***short-term, not significant*** and ***neutral***.

14.9.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place and the potential for more future development in the area. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible** and **neutral**.

14.10 REFERENCES

1. Waste Management Act 1996 (No. 10 of 1996) as amended.
2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Southern Region Waste Management Plan 2015 – 2021 (2015).
5. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
6. Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
7. Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
8. Department of Environment, Heritage and Local Government, Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006).
9. FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
10. Clare County Council (CCC), Clare County Development Plan 2017-2023 (As varied) (2017)
11. CCC, County Clare Waste Management Bye-Laws (2018)
12. BS 5906:2005 Waste Management in Buildings – Code of Practice
13. Planning and Development Act 2000 (No. 30 of 2000) as amended
14. Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)
15. Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
16. EPA, *European Waste Catalogue and Hazardous Waste List* (2002)
17. EPA, National Waste Database Reports 1998 – 2018.
18. US EPA, *Characterisation of Building Uses* (1998);
19. EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015)