

Shannon Technology and Energy Park (STEP) Power Plant

Environmental Impact Assessment Report – Volume 2

Chapter 16 Waste Management

Shannon LNG Limited

April 2024

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16. Waste Management

16.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) details the findings of an assessment of the effects of the Proposed Development with respect to waste management.

This chapter sets out the relevant aspects of the current state of the environment and the future receiving environment and goes on to consider the impact of the Proposed Development on waste management.

For the purpose of this EIAR, waste is defined as per the European Waste Framework Directive (Directive 2008/98/EC) as “any substance or object which the holder discards or intends or is required to discard” (EU 2008).

The scope of this waste management assessment includes:

- Waste generated by the construction and operation of the Proposed Development which includes the proposed Combined Cycle Gas Turbines (CCGT) gas-powered Power Plant capable of up to 600 MW of electricity generation, 120 MWh (1-hr) battery energy storage system (BESS), Above Ground Installation (AGI), and associated plant, equipment and infrastructure including a substation.
- Any potential cumulative impacts arising from wastes generated by the Proposed Development in combination with other projects.

The decommissioning phase waste impacts have not been assessed as outlined in **Section 16.3.4**.

The Site is located in the townlands of Kilcolgan Lower and Ralappane, between Tarbert and Ballylongford, Co. Kerry. The application Site boundary (‘red line’) encloses an area of approximately 41 hectares (ha) and is entirely owned by the Applicant.

Full details on the background, Site history and the Proposed Development is provided in **Chapter 02** (Description of the Proposed Development) and the Planning Statement submitted with this planning application.

16.1.1 Competent Expert

Michael Berney, Associate Director, BSc (Hons), MSc (Eng), MCIWM. Michael has 18 years’ experience in environmental consultancy, predominantly in the field of waste management in the United Kingdom (UK) and internationally. He has a firm understanding in the provision of technical planning application and architectural design support, through the development of Operational Waste Management Plans, and Waste Chapters as part of Environment Impact Assessments for a broad variety of developments.

16.2 Regulatory, Policy and Guidance Framework

The following legislation, policy, and guidance is relevant to the waste assessment.

16.2.1 Legislation and National Planning Policy

16.2.1.1 EU Legislation

Waste framework legislation establishes the legal structure for the prevention and management of waste. The European Commission (EC) has prepared waste framework legislation to govern this broad approach and the principles for managing waste across all Member States.

16.2.1.1.1 European Green Deal

The European Green Deal (EC, 2022) aims to transform the EU into a modern, resource-efficient, and competitive economy, ensuring:

- No net emissions of greenhouse gases by 2050.
- Economic growth decoupled from resource use.
- No person and no place left behind.

The European Green Deal aims to improve the well-being and health of citizens and future generations by providing longer lasting products that can be repaired, recycled, and reused.

16.2.1.1.2 Circular Economy Action Plan

The EC's Circular Economy Action Plan (CEAP) (EC, 2020) provides a future-oriented agenda for achieving a cleaner and more competitive Europe by presenting a set of interrelated initiatives needed for accelerating the transformational change required by the European Green Deal (EC, 2022). Section 4 of the CEAP highlights the importance of addressing waste exports from the EU and details the European Commission's aims to:

- Ensure that the EU does not export its waste challenges to third countries.
- Restrict exports of waste that have harmful environmental and health impacts in third countries.
- Strengthen controls of shipments of waste and improve sustainable management of waste in these countries.

The CEAP also highlights the importance of monitoring and reporting progress and aims to transform waste management practices in construction, minimise waste generation and maximise resource efficiency.

16.2.1.1.3 EU Construction and Demolition Waste Protocol and Guidelines

As part of the Circular Economy Package the European Commission has developed these guidelines to increase confidence in the C&D waste management process and to trust the quality of C&D recycled materials (EC, 2016). This will be achieved through:

- Improved waste identification, source separation and collection.
- Improved waste logistics.
- Improved waste processing.
- Quality management.
- Appropriate policy and framework conditions.

16.2.1.1.4 Basel Convention (Basel Convention, 1992)

The Basel Convention regulates transboundary movements of hazardous wastes and provides obligations upon its Parties to ensure that such wastes are managed and disposed of in an environmentally sound manner. The main principles of the convention are as follows:

- Transboundary movements of hazardous wastes should be reduced to a minimum, which is consistent with their environmentally sound management.
- Hazardous wastes should be treated and disposed of as close as possible to their source of origin.
- Hazardous waste generation should be reduced and minimised at source.
- Annexes I–VIII of the Basel Convention provide lists of waste categories requiring special consideration or controls, including disposal operations.
- Annex I outlines a list of waste categories to be controlled, Annex II details waste categories requiring special consideration and Annex III provides a list of important hazardous characteristics.

16.2.1.2 National Legislation and Policy

16.2.1.2.1 European Communities (Waste Directive) Regulations, 2011

The European Communities (Waste Directive) Regulations S.I. No. 126 of 2011 (as amended) (GOI, 2011) transpose the requirements of the European Waste Framework Directive (Directive 2008/98/EC) (European Parliament and The Council of the European Union, 2008), as amended by Directive (EU) 2018/851 (EU, 2018), into Irish legislation (herein after referred to as 'The Regulations'). The Regulations require that waste prevention programmes and waste management plans are established and that the waste hierarchy is applied. The waste hierarchy prioritises waste prevention, followed by preparing for reuse, recycling, other recovery (including energy recovery) and finally disposal.

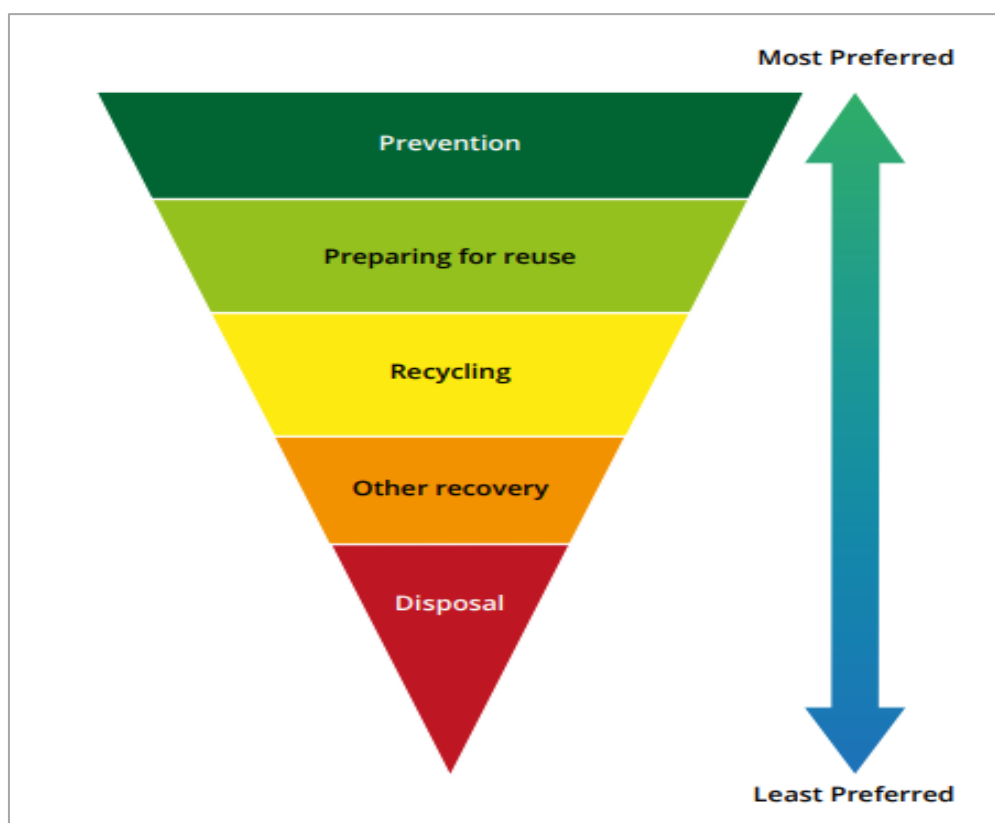


Figure 16.1: Waste Hierarchy

Source: EPA 2021b. *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*

For construction and demolition (C&D) waste, the Regulations (GOI, 2011) also require measures to be taken to achieve the following target:

- By 2020, the preparing for reuse, recycling, and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70% by weight.

To support the implementation of the waste hierarchy, the Regulations (GOI, 2011) also:

- **Article 27:** give provision for an operator to determine that a material is a by-product and not a waste, where certain conditions are met and if approved by the Environmental Protection Agency (EPA).
- **Article 28:** give provision for determining end-of-waste status, when a waste may cease to be a waste when it has undergone a recovery operation.

The assessment of waste within this chapter has taken account of the waste hierarchy in the management of waste, including the provisions under Article 27 and Article 28, and of the targets for recovery of non-hazardous C&D waste.

16.2.1.2.2 Climate Action Plan 2024

Following on from Climate Action Plan 2021, Climate Action Plan 2024 (DECC, 2023) includes a suite of measures at different stages of implementation to help reduce waste and support the transition towards a circular economy. These include:

- Strengthening the regulatory and enforcement frameworks for the waste collection and management system, to maximise circular economy principles.
- Enactment of the Circular Economy and Miscellaneous Provisions Act 2021.
- Publication of the Whole-of-Government Circular Economy Strategy 2022-2023, including focus on awareness raising, Green Public Procurement, and international partnerships.
- Develop a Bioeconomy Action Plan.
- Develop new and expanded environmental levies to encourage reduced resource consumption and incentivise higher levels of reuse and recycling.
- Establish a circular economy innovation scheme.
- Publication of the National Food Waste Prevention Roadmap 2023-2025.

16.2.1.2.3 Circular Economy and Miscellaneous Provisions Act 2022

The Circular Economy and Miscellaneous Provisions Act 2022 (House of Oireachtas, 2022) provides for the following:

- The making by the Minister for the Environment, Climate and Communications of a circular economy strategy.
- The establishment of the Circular Economy Fund; to make provision in relation to the Environment Fund.
- The establishment by the EPA of a circular economy programme.
- For the use by local authorities of closed-circuit television and mobile recording devices in certain circumstances and for that purpose to amend the Waste Management Act 1996 and the Litter Pollution Act 1997.
- Inclusion of targets in respect of reused and repaired products and materials in waste management plans.
- The operation of the national waste collection permit office.
- Waste recovery levy.
- Making by the Minister for the Environment, Climate and Communications of regulations to regulate end-of-waste and by-product notifications to the EPA.
- Giving further effect to Directive 2008/98/EC of the European Parliament and of the Council of 19th November 2008.
- To amend the Waste Management Act 1996.
- Prohibition on certain licences relating to coal, lignite, and oil shale and for that purpose to amend the Minerals Development Act 1940 and the Minerals Development Act 2017.
- Applications to the EPA for licences, reviews of licences or revised licences in circumstances where an order under section 181(2)(a) of the Planning and Development Act 2000 has been made, or is proposed to be made, by a Minister of the Government for development comprising or for the purposes of the activity to which the application relates and for that purpose to amend the EPA Act 1992; to give further effect to Directive (EU) 2019/944 of the

European Parliament and of the Council of 5 June 2019 and for that purpose to amend the Electricity Regulation Act 1999; and to provide for related matters.

16.2.1.2.4 Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025

A Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025 (DECC, 2020) ('the WAP') sets out Ireland's approach to transitioning to a circular economy.

For C&D waste, the WAP supports the provisions and targets of the European Communities (Waste Directive) Regulations (GOI, 2011) by undertaking to streamline the decision-making processes for by-product notifications and end-of-waste and updating best practice guidance in line with the waste hierarchy.

This document has been considered within the assessment as it sets out the priority approaches for the construction sector to support delivery of the national C&D waste recovery target.

The WAP calls for the replacement of the existing Regional Waste Management Plans with a single National Waste Management Plan containing targets for reuse, repair, resource consumption and a reduction in contamination. The single plan will aim to build on the progress from 2015, strengthen national capacity and delivery while retaining a regional focus for implementation. Development of this National Waste Management Plan is currently ongoing with the draft closed for public consultation in 2023.

16.2.1.2.5 National Hazardous Waste Management Plan (NHWMP) 2021-2027

The NHWMP sets out a strategic plan for best practice in hazardous waste management in Ireland to protect the environment and human health. Best practice management of hazardous waste will be achieved through the following:

- Drive priority prevention actions by industry and the public to reduce the generation of hazardous waste.
- Support the identification of adequate and appropriate collection infrastructure for all hazardous wastes with a view to mitigating environmental and health impacts.
- Endorse the proximity principle such that hazardous wastes are treated as close to the point of production as possible – including within Ireland, taking into account geographical circumstances or the need for specialised installations for certain types of waste.
- Support effective regulation of the movement and disposal of hazardous waste in line with national policy priorities.
- Promotion of safe reuse and recycling pathways in support of the circular economy.

16.2.1.2.6 Draft National Waste Management Plan for a Circular Economy (the 'Draft Plan')

The Draft Plan (mywaste, 2023) sets out a framework for the prevention and management of waste in Ireland for the period 2023 to 2029. Its primary aims are to encourage sustainable consumption, prevent the generation of waste, improve the capture of materials to optimise circularity, and enable compliance to policy and legislation.

All three Regional Waste Management Planning Offices (Southern, Eastern / Midlands, and Connacht Ulster) are currently engaged in the publication process with submissions and observations from the public consultation to be taken into consideration for its development.

16.2.2 Regional and Local Planning Policy

16.2.2.1 Kerry County Development Plan 2022-2028

The Kerry County Development Plan (CDP) 2022-2028 (KCC, 2022) sets out the overall planning and sustainable development strategy for the county. The Kerry CDP:

- Replaces the Kerry CDP 2015-2021.
- Incorporates existing Town Development Plans (as extended and varied).
- Requests the review of Local Area Plans (LAPs) for Tralee, Killarney, and Listowel Municipal Districts within 12 months of the adoption of the CDP.

Kerry's transition to a circular economy is cited as being one of the key areas for informing the CDP's Core Strategy, recognising that all resources are scarce and the importance of reuse, renewal, and repair principles to minimise waste generation. In support of circular economy principles, this means that waste should be managed using the following waste hierarchy approach (in order) before disposal as the outcome:

1. Prevention.
2. Preparation for reuse.
3. Recycling.
4. Recovery.

Additionally, the CDP includes the following relevant Waste Management Policy Objectives (POs):

- **KCDP 13-27:** Implement the Regional Waste Management Plan, focusing on waste reduction, reuse, recycling, and sustainable disposal of residual waste.
- **KCDP 13-28:** Facilitate the implementation of the current Regional Waste Management Plan, including any replacement or amending plans. Emphasise the adoption of the waste hierarchy and maximise waste diversion from landfills.

There are no specific POs within the CDP for the management of C&D waste, however, there is a section on C&D waste that emphasises the need to apply the waste hierarchy approach and alignment with the 70% target for reuse, recycling, and recovery of C&D waste in Ireland by 2020 set out by the European Communities (Waste Directive) Regulations 2011.

16.2.2.2 Southern Region Waste Management Plan 2015-2021

For the purposes of waste management planning, Ireland is divided into three Regional Waste Management Planning Offices: Southern, Eastern Midlands, and Connacht Ulster. Waste Management Plans for the three regions were published in May 2015. The Proposed Development is located within the Southern region.

The Southern Region Waste Management Plan 2015-2021 (SWR, 2015) provides the framework for the prevention and management of wastes in a safe and sustainable manner.

The National Waste Management Plan for a Circular Economy (**Section 16.2.1.2.5**) will replace the Southern Region Waste Management Plan 2015-2021. The Proposed Development will be subject to the framework of the National Waste Management Plan for a Circular Economy (mywaste, 2023) once it is published by the Regional Waste Planning Offices.

16.2.2.3 Circular Economy Checklists for Construction

This series of Circular Economy Checklists (SWR, 2021) have been developed by the Southern Waste Region. The aim of the checklists is to raise awareness of the Circular Economy with key actors within the construction sector who all have a role to play in making the sector more circular and provide some early considerations to contemplate.

16.2.3 Guidance

In the absence of specific guidance or requirements for waste in Environmental Impact Assessment (EIA) in Ireland, professional judgement is used to determine the magnitude and significance of effect, considering the following EIA guidance.

The following guidelines have been adhered to in the preparation of the Construction Environmental Management Plan (CEMP) and Resource and Waste Management Plan (RWMP), refer to **Appendix A2.3** and **Appendix A16.1** respectively.

16.2.3.1 EPA Guidelines on the Information to be Contained in Environmental Impacts Assessment Reports

The EPA Guidelines (EPA, 2022a) have been drafted with the primary objective of improving the quality of EIARs with a view to facilitating compliance (with the EIA Directive). By doing so they contribute to a high level of protection for the environment through better informed decision-making processes. They are written with a focus on the obligations of developers who are preparing EIARs. There are seven generalised degrees of effect significance that are commonly used in EIA:

- Imperceptible.
- Not Significant.
- Slight.
- Moderate.
- Significant.
- Very Significant.
- Profound.

When more specific definitions exist within a specialised factor or topic, these should be used in preference to these generalised definitions.

16.2.3.2 IEMA Guide to Materials and Waste in Environmental Impact Assessment. Guidance for a Proportionate Approach

The Institute of Environmental Management and Assessment (IEMA) “*Guide to Materials and Waste in Environmental Impact Assessment. Guidance for a Proportionate Approach*” (referred to as the IEMA Guidance herein, (IEMA, 2020)) provides guidance on the key terms, concepts, and considerations for assessing the environmental impacts and effects of materials and waste, as part of the EIA process. The guide is focused on the UK regulatory framework, although the principles are broadly applicable to EU jurisdictions, and have been used to inform the assessment methodology. However, it is not possible to use part of methodology which compares project waste arisings against national landfill capacity since remaining landfill void data for Ireland is not available - therefore, waste arisings are compared against national waste arisings. The approach to applying sensitivity has not been applied since waste

arisings are not compared to landfill void data. Magnitude of impact has been aligned with significance of effects thresholds in the IEMA Guidance as show in **Table 16.1**. It is not possible to fully align these significance effects thresholds with the EPA generalised definitions since the EPA Guidelines have seven generalised definitions and the IEMA Guidance has five thresholds.

16.2.3.3 EPA Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects

The EPA *Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects* (EPA, 2021b) provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design through to construction and deconstruction. The guidelines provide clients, developers, designers, practitioners, contractors, sub-contractors, and competent authorities with a common approach to preparing RWMPs. The guidelines address the best practice approach both prior to construction, including the stages of design, planning and procurement in advance of works on-site, and during construction, relating to the effective management of resources and wastes during construction or demolition operations.

16.3 Methodology

16.3.1 Study Area

The study areas for the assessment of impacts related to waste management have been defined in line with the IEMA Guidance. Two types of study area are defined in the IEMA Guidance:

- A 'Proposed Development Study Area' - relevant to waste generation.
- An 'Expansive Study Area' - relevant to management of waste.

16.3.1.1 Proposed Development Study Area

The study area for waste arising from the construction of the Proposed Development comprises the area defined by the Site of the Proposed Development, refer to **Chapter 02** (Description of the Proposed Development).

16.3.1.2 Expansive Study Area

The study area for assessing impacts of non-hazardous waste on waste arisings and inferred waste management capacity comprises Ireland due to the need to consider all available waste management infrastructure capacity. Waste management capacity is inferred from national waste arisings since data for national waste management capacity is not readily available.

The study area for assessing impacts of hazardous waste on waste arisings and on inferred waste management capacity also comprises Ireland, although it is noted that a proportion of hazardous waste arising in Ireland is managed outside of the country, refer to **Table 16.6**.

The baseline information on waste arisings in Ireland has been sourced from the most recent available data published by the EPA.

16.3.2 Methodology for Determining Construction and Demolition (C&D) Effects

The potential impacts of the Proposed Development with regards to waste management are the effects that waste arisings generated on-site will have on the capacity of waste management infrastructure in the study area and on meeting national targets for waste recovery.

The main construction and demolition phase impacts will be associated with the management of waste from:

- Demolition works (including removal of existing buildings, other structures, and foundations).
- Site preparation and earthworks (including for new foundations and imported materials).
- Surplus or damaged construction materials.
- Packaging.
- Maintenance of plant and equipment used for construction.
- Construction workforce activities.

In the absence of specific guidance or requirements for Ireland, professional judgement, and available guidance, as noted in **Section 16.2.3**, were used to determine magnitude and significance of effect by the following approach:

- Establishing the baseline waste arisings (and inferred infrastructure capacity) for the expansive study area.
- Estimating the likely types and quantities of waste that will be generated by the Proposed Development and the likely extent to which these will be recycled or recovered or require disposal.
- For each category of waste, comparing the likely waste arisings from the Proposed Development to the baseline waste arisings and confirming whether sufficient management capacity is expected to be available.
- Assessing whether the Proposed Development conforms to relevant Ireland and European waste policies and strategies, specifically regarding targets for the recovery of non-hazardous C&D waste (excluding naturally occurring soil and stones (waste code 17 05 04)).

The criteria used for assessing the magnitude of impacts and significance of effects are shown in **Table 16.1** and combine the guidance provided in the 2022 EPA Guidelines on generalised degrees of effect significance that are commonly used in EIA and the guidance on magnitude and significance in the IEMA Guidance.

Table 16.1: Magnitude of Impact and Significance of Effect Criteria (IEMA, 2020)

Magnitude of Impact IEMA Guidance / EPA Guidelines	Effect IEMA Guidance	Significance of Effect IEMA Guidance / EPA Guidelines	Criteria
No Change / Imperceptible	Neutral	Neutral / Not Significant	<ul style="list-style-type: none"> Project achieves 100% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. Zero waste generation from the development.
Negligible / Not Significant	Neutral or Slight	Neutral or Slight / Not Significant	<ul style="list-style-type: none"> Project achieves 90-99% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. Project waste arisings are ≤1% of national waste arisings (for the relevant categories of waste).
Minor / Slight	Slight	Slight / Not Significant	<ul style="list-style-type: none"> Project achieves 60-89% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. Project waste arisings are 1-5% of national waste arisings (for the relevant categories of waste).
Moderate / Moderate	Moderate	Moderate / Significant	<ul style="list-style-type: none"> Project achieves 30-59% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. Project waste arisings are 6-10% of national waste arisings (for the relevant categories of waste).
Major / Significant	Moderate or large	Moderate or Large / Significant	<ul style="list-style-type: none"> Project achieves <30% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. Project waste arisings are >10% of national waste arisings (for the relevant categories of waste).

The EPA Guidelines have two additional generalised definitions (very significant and profound) however these are not included since there are no equivalent criteria in the IEMA Guidance.

16.3.3 Methodology for Determining Operational Effects

The operational phase of the Proposed Development is expected to generate the following waste:

- Small quantities of oils and chemicals (including lubrication oils, propane, ammonia, compressor cleaning detergent, general oils and greases for rotating machinery).
- Bottles and canisters from gases stored on-site.
- Scrap metals and wood.
- Waste Electrical and Electronic Equipment (WEEE) and lead batteries.
- Other waste including fluorescent tubes, aerosols, R410A Cores, Deha tank residues, and cleaning fluids.

General commercial waste arisings from these maintenance activities are expected to include:

- Office waste.
- Dry mixed waste.
- Worker waste (including food waste).

- Packaging.

The waste arisings from operational effects have been assessed against baseline waste arisings for the expansive study area. However, due to information not being available on the exact quantities of these wastes, this assessment will be based on developments of a similar nature and type.

16.3.4 Methodology for Determining Decommissioning Effects

The Proposed Development is expected to have a design life of 25 years and as such, it is not possible to identify at this stage either the waste management routes or specific facilities that will be used, as these are liable to change over such a timescale.

Where decommissioning takes place, all above-ground components associated with the Proposed Development will be disassembled and removed from the Site, the waste types generated from this are likely to be similar or of a lesser magnitude than the construction effects. However, prior to removal of plant, all residues and operating chemicals will be cleaned out from the plant and disposed of at a suitably licenced facility.

All management of waste will be in accordance with the relevant regulations and waste will be transported by licenced waste hauliers to waste management sites which hold the necessary regulatory authorisation and / or permits for those wastes consigned to them. Therefore, decommissioning waste impacts have not been assessed.

As outlined in **Chapter 02** (Description of the Proposed Development), in the event of decommissioning, measures will be undertaken by the Applicant to ensure that there would be no significant, negative environmental effects from the Proposed Development. Examples of the measures that would be implemented are outlined in **Section 2.11, Chapter 02** (Description of the Proposed Development). As a result, additional potential impacts and associated effects arising during the decommissioning phase are not anticipated above and beyond those already assessed during the construction phase. The majority of the physical assets on-site will comprise of steel, concrete or asphalt, all of which are capable of being recycled.

16.3.5 Limitations and Assumptions

The assessment presented herein has been developed based on the following limitations and assumptions:

- The assessment has been undertaken on the basis of information available at the time of writing.
- Waste arising from the off-site extraction, processing and manufacture of plant and materials used in the Proposed Development has been scoped out of this assessment. This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain.
- There is no collated published information on the potential changes to the national waste arisings and inferred waste management capacity for the period within which the Proposed Development is expected to be constructed. Accordingly, the current baseline is assumed to apply.

- Planned demolition activities are restricted to the removal of derelict buildings and structures, including a small farm complex, dwelling, a gun emplacement structure, a disused well, and a field boundary wall.
- Any impacts associated with the management of hazardous waste at waste management facilities in countries outside of Ireland are not included in the scope of this assessment, since it is assumed that they will have been assessed and (where necessary) mitigated as part of the planning and permitting of these facilities.
- Other environmental impacts associated with the management of waste from the Proposed Development (e.g. on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage, or off-site transport of materials and waste) are addressed separately in other relevant chapters.

16.4 Baseline Environment

The current state of the environment comprises baseline information on waste arisings and waste management in Ireland. The baseline information has been sourced from the most recent data collated and published by the EPA (EPA, 2023b) as shown in **Table 16.2** to **Table 16.4**.

16.4.1 Construction and Demolition Waste Arisings

Table 16.2 summarises the types and quantities of construction and demolition (C&D) waste collected by authorised waste collectors in Ireland in 2021 (EPA, 2023b). It shows that 9,043,749 tonnes of C&D waste was collected, with the majority comprising soil, stones and dredging spoil (85.1%). Excluding soils, stones and dredging spoil, the total national C&D waste collected was 1,347,462 tonnes.

Table 16.2: C&D Waste Collected in Ireland in 2021

C&D Waste Type	Quantity Collected (tonnes)	Proportion of Total (%)
Bituminous mixtures	87,343	1.0%
Concrete, brick, tile and gypsum	608,235	6.7%
Metal	257,558	2.8%
Mixed C&D waste	362,380	4.0%
Segregated wood, glass and plastic	31,946	0.4%
Soils, stones and dredging spoil *	7,696,287	85.1%
Total	9,043,749	100%

* Hazardous contaminated soil generated in Ireland in 2021 amounted to 32,951 tonnes. 32,624 tonnes were treated at facilities in Ireland, whilst 327 tonnes were exported for treatment (EPA, 2023a).

16.4.2 C&D Waste Management

Table 16.3 and **Table 16.4** set out the treatment methods used for managing C&D waste in Ireland in 2021, as reported by the EPA (EPA, 2023b). Waste treatment by backfilling was the most utilised treatment method, managing 85.3% of C&D waste, mainly comprising soils, stones and dredging spoil waste type.

Table 16.3: C&D Waste Treatment (tonnes) in Ireland in 2021

C&D Waste Type	Treatment Type				Total (tonnes)
	Recycling (tonnes)	Energy Recovery (tonnes)	Backfilling (tonnes)	Disposal (tonnes)	
Bituminous mixtures	41,150	1,505	33,449	8,527	84,631
Concrete, brick, tile and gypsum*	262,685	1,244	299,725	16,568	580,223
Metal waste	272,734				272,734
Mixed C&D waste	398	73	88,747	34,356	123,573
Segregated wood, glass and plastic	50,348	13,918	743	407	65,417
Soils, stones and dredging spoil		34	7,251,952	450,267	7,702,253
Waste treatment residues	51,892	9,323	39,122	114,580	214,917
Total	679,208	26,098	7,713,738	624,705	9,043,749

*No gypsum was backfilled or landfilled.

Source: EPA, 2023a

Table 16.4: C&D Waste Treatment (%) in Ireland in 2021

C&D Waste Type	Treatment Type			
	Recycling (%)	Energy Recovery (%)	Backfilling (%)	Disposal (%)
Bituminous mixtures	48.6%	1.8%	39.5%	10.1%
Concrete, brick, tile and gypsum**	45.3%	0.2%	51.7%	2.9%
Metal waste	100.0%	-	-	-
Mixed C&D waste	0.3%	<0.1%	71.8%	27.8%
Segregated wood, glass and plastic	77.0%	21.3%	1.1%	0.6%
Soils, stones and dredging spoil	<0.1%	<0.1%	94.2%	5.8%
Waste treatment residues	24.1%	4.3%	18.2%	53.3%
Total	7.5%	0.3%	85.3%	6.9%

Source: EPA, 2023b

The EPA reported that in 2021, 96% of C&D waste underwent final treatment within Ireland, with 4% exported for final treatment (EPA, 2023b).

The reported quantities of C&D waste collected **Table 16.2** and treated **Table 16.3** in Ireland differ. The EPA identifies that the differences are due to the data being collated from different datasets. Waste collectors record waste as it enters the waste treatment network, whereas the final treatment data indicates what happens to waste at the end of its journey through the waste treatment network. This can lead to differences in waste classifications and quantities.

The EPA's Progress to EU Targets (EPA, 2022b) reports Ireland's performance against targets set out in European Directives. In terms of the Waste Framework Directive (2008/98/EC) (EC, 2008) target of "Preparing for reuse, recycling and other material recovery (incl. beneficial backfilling operations using waste as a substitute) of 70% by weight of non-hazardous construction and demolition waste (excluding

natural soils & stone), by 2020” a performance of 78% was reported for 2020, exceeding the 70% target.

16.4.3 Waste Management Facilities

The waste management facilities to be utilised by the Proposed Development will be determined by the appointed Contractor. Waste disposal and recovery activities in Ireland require authorisation in accordance with the Waste Management Act 1996 as amended. A waste recovery or disposal activity at a facility is either:

- an exempted activity (no authorisation required), or
- requires a Waste (or Industrial Pollution Control (IPC) licence, or
- requires a Waste Facility Permit, or
- requires a Waste Certificate of Registration / Registration Certificate.

The EPA is the competent authority for granting and enforcing Industrial Emissions (IE) and IPC licences for specified industrial and agriculture activities including waste management.

Appendix A16.2, Volume 4 provides additional information on waste management facilities in Ireland, including the annual acceptance limits for operational landfills, incinerators, waste to energy facilities, and composting, anaerobic digestion and biostabilisation of organic fines facilities.

16.4.4 Article 27: By-Product Notifications

Article 27 of the European Communities (Waste Directive) Regulations, 2011 (GOI, 2011) allows an operator to decide, under certain circumstances, that a material is a by-product and not a waste. This provision is often invoked in connection with C&D material, and particularly soil and stone. It allows materials to be used elsewhere in construction projects as a by-product and not discarded as a waste. Decisions made by economic operators under Article 27 must be notified to the EPA. The EPA may determine to agree with the economic operator’s decision, as notified; alternatively, after consultation with the notifier and the relevant local authority, the EPA may determine that the notified material is waste.

Table 16.5 summarises the soil and stone by-product notifications submitted to the EPA in 2021. The EPA received by-product notifications for 12,526,137 tonnes of soil and stone material. Notifications for 155,200 tonnes were withdrawn. The EPA determined that 459,836 tonnes of the soil and stone notified were by-product and that 600 tonnes were waste. The estimated quantity of soil and stone material notified in 2021 for which no determination was made to date, amounted to 11,913,301 tonnes (EPA, 2023b).

By-product notifications do not necessarily mean that any or all of the material was generated or indeed moved. Notifiers of by-product may not have proceeded with the activities related to the by-product notifications. However, if they did proceed, the materials would not have entered the waste management network or be included in the EPA’s 2021 C&D waste statistics data. Only material notified as by-product, determined to be waste, generated and moved as waste in 2021 is covered by the EPA’s C&D waste statistics data.

Table 16.5: Soil and Stone By-Product Notifications Submitted 2021

Soil and Stone By-Product Notifications	Quantity (tonnes)
Notifications withdrawn	152,400
By-product as notified	459,836
Determined as waste	600
No determination made	11,913,301
Total	12,526,137

Source: EPA, 2023b

16.4.5 Municipal Waste Arisings

The EPA reports that in 2021, Ireland generated 3.17 million tonnes of municipal waste (EPA, 2021c), which includes both waste from households, and similar types of waste from commercial activities. The EPA does not publish statistics for overall generation of non-hazardous industrial waste, although it reports that in 2017 113,825 tonnes of industrial waste were disposed of and landfilled and 46,020 tonnes were recovered.

16.4.6 Hazardous Waste Arisings and Management

The EPA reported that 466,941 tonnes of hazardous waste was generated in Ireland in 2021 (EPA, 2023a) and managed via the management routes shown in **Table 16.6**. The construction sector produced 22.8% of Ireland's hazardous waste in 2021 (EPA, 2023a). The quantity of hazardous waste generated by C&D depends on the amount of construction activity to redevelop brownfield sites and on dredging works. C&D waste also includes smaller quantities of asbestos-containing material, asphalt, as well as contaminated wood, concrete, bricks, metals, and tiles.

Table 16.6: Hazardous Waste Generation and Management in 2021

Waste type and Management Route	Quantity (tonnes)
Hazardous waste - treated at Irish hazardous waste treatment facilities	95,130
Hazardous waste - treated at EPA licenced facilities	115,951
Hazardous waste (excluding soils) - exported for treatment	222,909
Contaminated soil - treated in Ireland	32,624
Contaminated soil - exported for treatment	327
Total	466,941

Source: EPA, 2023a

Transboundary shipments of hazardous waste in Ireland are required to be carried out in accordance with the Basel Convention and require approvals from the competent authorities in Ireland (Dublin City Council) and the receiving country. This may be required in the case of small quantities of hazardous waste for which there is no suitable management route in Ireland (e.g. waste chemicals). Refer to **Section 16.9**.

16.4.7 Future Receiving Environment

There is no collated published information on the potential changes to the national waste arisings for the period within which the Proposed Development is expected to be constructed. The Construction & Demolition Waste: Soil and Stone Recovery / Disposal Capacity - Update Report 2020 (GOI, 2020b)

presents a forecast of potential C&D waste arisings to the year 2029 that takes account of the sharp reduction in arisings due to the impact of the Covid-19 pandemic. These forecasts indicate that C&D waste arisings may return to pre-pandemic levels by 2025 / 2026. Accordingly, the current baseline is assumed to apply between the planned commencement of construction of the Proposed Development through to its opening year.

16.5 Assessment of Impact and Effect

16.5.1 Do Nothing Scenario

In the 'Do Nothing' scenario, is taken forward, there will be no generation of waste products as a result of the Proposed Development.

16.5.2 Construction Phase

16.5.2.1 Waste Types

Table 16.7 summarises the main types of materials that will be used and the waste that are likely to arise during the construction phase of the Proposed Development.

Table 16.7: Estimated Types of Material Use and Waste Arising from the Construction of the Proposed Development

Activity	Material Use	Waste Arising
Site remediation, preparation, and earthworks, including excavation	<ul style="list-style-type: none"> • Fill material for construction purposes. • Primary / secondary / recycled aggregates for ground stabilisation. 	<ul style="list-style-type: none"> • Surplus excavated materials (limited excavation anticipated). • Surplus subsoil. • Unsuitable and contaminated soils and excavated materials. • Vegetation from site clearance (small quantities). • Clearance of hardstanding.
Demolition	<ul style="list-style-type: none"> • Installation of temporary supports and careful isolation of building structures from any adjacent structures. 	<ul style="list-style-type: none"> • Hard inert waste such as concrete, brick and stone (small quantities from the demolition of a small farm complex, a former dwelling, a gun emplacement structure, a well and a field boundary).
Construction	<p>Main construction materials including:</p> <ul style="list-style-type: none"> • Aggregates (including well graded materials, granular fill, backfill, pipe bedding and drainage media). • Asphalt and bituminous materials. • In-situ cast concrete. • Steel reinforcing bar (for reinforced concrete). • Precast concrete products (components, kerbs, drainage pipes, chambers and channels). • Composite PVC / Plastisol. 	<ul style="list-style-type: none"> • Excess, offcuts, and broken / damaged construction materials. • Packaging from materials delivered to site. • Construction worker wastes from offices and rest areas / canteens. • Waste oils from construction plant.

All effects are deemed to be **Temporary** due to the length of the construction programme.

16.5.2.2 Estimated Waste Arisings

The estimated C&D waste arisings to be generated on-site have been compared to the quantity of C&D waste collected in Ireland in 2021 (excluding soils, stones and dredging spoil), the capacity of waste management infrastructure in the study area and on meeting national targets for waste recovery.

The Waste and Resources Action Programme (WRAP) construction, demolition and excavation waste volume to mass conversion factors (WRAP, 2014) and National Highways material density factors (National Highways, 2021) have been used to convert the material quantities / volumes to tonnes so that they can be assessed against C&D waste collected in Ireland in 2021.

Estimates of quantities of waste from vegetation clearance are not available at this stage but are expected to generate small quantities.

16.5.2.3 Demolition Phase

Planned demolition activities are restricted to the removal of derelict buildings and structures, including a small farm complex, dwelling, a gun emplacement structure, a disused well, and a field boundary wall. Waste generated from demolition of these buildings and structures are expected to be **Slight / Not Significant** in the context of national waste arisings and significantly less than those arising from the construction of the Proposed Development.

Demolition quantities from the Proposed Development are not yet available so a quantitative assessment has not been conducted at this stage of the assessment however a qualitative assessment has been undertaken.

16.5.2.4 Construction Phase

Table 16.8 shows the main types and quantities of estimated waste generated by buildings and enclosures during the construction of the Proposed Development and their potential recovery rates. The total amounts of waste have been calculated using the benchmarks and baselines for industrial buildings taken from the Construction Resources and Waste Platform (CRWP, 2010).

Table 16.9 sets out the main types and quantities of estimated hardstanding waste generated by roads and parking areas during the construction works. Quantities were calculated by applying the wastage rates set out in WRAP's designing out waste tool (WRAP, n.d.(b)) to material quantities required to build the roads and parking areas.

Additional concrete is also likely to be generated from the construction of containment walls for other structures including a utility sleeper, a retaining wall and a fuel oil storage and pumping facility. A 5% wastage rate has been applied in accordance with WRAP's designing out tool (WRAP, n.d.(b)), estimating 1,382 tonnes of waste to be generated.

Table 16.9 summarises the total waste arisings shown in **Table 16.8** and **Table 16.9** and the additional waste arisings from the other structures.

The estimated recovery rates in **Table 16.8**, **Table 16.9** and **Table 16.10** are based on the 'good practice quick wins' recovery rates set out in the '*Achieving Good Practice Waste Minimisation and Management*' report published by WRAP (WRAP, n.d.(a)). The overall recovery rate is calculated based on tonnage.

Table 16.8: Estimated Main Types and Quantities of Building and Enclosures Waste Generated During Construction

Waste Type	Waste Classification	Total Amount (tonnes)	Potential Waste Management Route	Potential Standard Practice Recovery Rate (%)	Recovery (tonnes)	Potential Good Practice Recovery rate (%)	Recovery (tonnes)	Potential Best Practice Recovery rate (%)	Recovery (tonnes)
Bricks	Non-hazardous	220	Recycling off-site at licenced facility	75	165	85	187	100	220
Tiles & Ceramics	Non-hazardous	2	Recycling off-site at licenced facility	75	1.5	85	1.7	100	2
Concrete	Non-hazardous	1,018	Concrete crushed on site and recycled as fill or recycling off-site at licenced facility	75	764	95	967	100	1,018
Inert	Inert	601	Recovery / recycling off-site at licenced facility	75	451	95	571	100	601
Insulation	Non-hazardous	9	Recycling or energy recovery off-site at licenced facility	12	1.08	50	4.5	75	6.75
Metals	Non-hazardous	59	Recycling off-site at licenced facility	95	56	100	59	100	59
Packaging	Non-hazardous	42	Recycling off-site at licenced facility	60	25	85	36	95	40
Gypsum	Non-hazardous	23	Recovery / recycling off-site at licenced facility	12	2.76	50	11.5	75	17
Binders	Non-hazardous	1	Recovery / recycling off-site at licenced facility	12	0.12	50	0.5	75	0.75
Plastics	Non-hazardous	7	Recycling off-site at licenced facility	60	4.2	80	5.6	95	6.65
Timber	Non-hazardous	48	Recycling or energy recovery off-site at licenced facility	57	27	90	43	95	46
Canteen, Office, ad hoc	Non-hazardous	13	Recycling off-site at licenced facility	12	1.56	50	6.5	75	14

Waste Type	Waste Classification	Total Amount (tonnes)	Potential Waste Management Route	Potential Standard Practice Recovery Rate (%)	Recovery (tonnes)	Potential Good Practice Recovery rate (%)	Recovery (tonnes)	Potential Best Practice Recovery rate (%)	Recovery (tonnes)
Asphalt & Tar	Non-hazardous	51	Recycling off-site at licenced facility	75	38	95	49	100	51
Hazardous*	Hazardous	16	Recycling off-site at licenced facility	50	8	**Limited Information	N/A	**Limited Information	N/A
Mixed	Non-hazardous	192	Recycling off-site at licenced facility	12	23	50	96	75	144
Total:		2,288			1,560 (overall recovery rate, 68%)		2,038 (overall recovery rate, 89%)		2,226 (overall recovery rate, 97%)

* Excluded from the calculation of total recovery rate (%) and not included in the total quantity of waste (2,288 tonnes).

** This cannot be 100% as much hazardous waste (e.g. asbestos) must be landfilled

Table 16.8 uses generic waste compositions for industrial buildings (CRWP, 2010) however the buildings and enclosures in the Proposed Development are anticipated to be constructed from the following:

- Composite PVC / Plastisol.
- Laminated insulated membrane with integral steel support decking.
- Laminated insulated vertical profiled modular steel cladding.

Table 16.9: Estimated Main Types and Quantities of Waste from Roads and Parking Areas During Construction

Waste Type	Waste Classification	Total Amount (tonnes)	Potential Waste Management Route	Potential Standard Practice Recovery Rate (%)	Recovery (tonnes)	Potential Good Practice Recovery rate (%)	Recovery (tonnes)	Potential Best Practice Recovery rate (%)	Recovery (tonnes)
Aggregate	Inert	322	Recycling off-site at licenced facility	75	242	95	306	100	322
Asphalt	Inert	80	Recycling off-site at licenced facility	75	60	95	76	100	80
Total:		402			302 (overall recovery rate, 75%)		382 (overall recovery rate, 95%)		402 (Overall recovery rate, 100%)

Table 16.10: Non-hazardous Construction Waste Summary Table

Structure Type	Total Amount (tonnes)	Overall Standard Recovery Rate (%)	Overall Good Recovery Rate (%)	Overall Best Recovery Rate (%)
Buildings and Enclosures	2,288	68	89	97
Roads and Parking Areas	402	75	95	100
Concrete Containment Walls	1,382	75	95	100
Total:	4,072			

* Total excludes total estimated hazardous waste (Table 16.8)

The estimated quantities of construction waste (**Table 16.10**) are estimated to be 4,088 tonnes (includes hazardous waste). Compared to the quantity of C&D waste collected in Ireland in 2021 (excluding soil, stones and dredging spoil) and assuming all waste requires off-site management, this would account for 0.30% of total national C&D waste arisings (1,347,462 tonnes). Since this is <1% of total C&D waste arisings, the impact is considered to be **Slight / Not Significant** as per **Table 16.1** in **Section 16.3.2**.

16.5.2.5 Excavation and Earthworks

All excavated material will be reused onsite, within the development area, and no import of soil is required so a balanced cut and fill is proposed so the impact is considered to be **No Change / Imperceptible** as per **Table 16.1** in **Section 16.3.2**.

The Site has historically been used for agriculture and consequently it is anticipated that no soil contamination will be encountered. In the unlikely event of any evidence of soil contamination being found during work on the Proposed Development, the appropriate remediation measures will be employed, refer to **Chapter 05** (Land, Soils and Geology). Any work of this nature will be carried out in consultation with, and with the approval of the Environmental Department of Kerry County Council (Kerry Co. Co.).

16.5.2.6 Municipal Waste and Hazardous Waste

Small quantities of municipal waste will likely be generated during construction this may include canteen and ad hoc waste from the construction workforce (13 tonnes as outlined in **Table 16.8**). Hazardous waste (e.g. oily waste and batteries from the construction plant and maintenance, waste paints and chemicals etc.) (16 tonnes as outlined in **Table 16.8**) are also expected to be generated in minimal quantities. The quantities are anticipated to be small in the context of national waste arisings (3.17 million tonnes of municipal waste (EPA, 2021c) and 466,941 tonnes of hazardous waste (EPA, 2023a)) therefore as municipal and hazardous waste will be $\leq 1\%$ of national waste arisings, a **Negligible / Not Significant** impact as per **Table 16.1** in **Section 16.3.2**.

Procedures for the storage and management of hazardous wastes are set out in the RWMP (**Appendix A16.1**) which will be implemented by the appointed Contractor and that Contractor will update the RWMP, where necessary, to comply with planning conditions and in agreement with Kerry Co. Co.

Appendix A16.2 also provides more information regarding potential waste management routes.

16.5.2.7 Anticipated Recovery Rates by Material

The waste management facilities to be utilised during demolition and construction and their suitability will be determined by the appointed Contractor. Since it is not possible to estimate the exact composition of construction waste at this time, a total recovery rate in line with the national performance of 78% (reported for 2020), is anticipated and likely to be achievable for non-hazardous construction waste (excluding naturally occurring soil and stones (Waste Code 17 05 04)). Overall, a total recovery rate between 68-88% is likely to be achieved for non-hazardous construction waste (excluding naturally occurring soil and stones (Waste Code 17 05 04)) managed off-site from buildings and enclosures. A total recovery rate of 75% is likely to be achieved for inert construction waste arising from roads and parking areas as well as the concrete containment walls.

The Proposed Development is therefore likely to achieve 60-89% or 90-99% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in

category 17 05 04 in the List of Wastes, indicating a magnitude of impact is considered to be **Slight**, this is assessed to result in a **Slight / Not Significant** effect.

Standard, good and best practice recovery rates by material are provided by WRAP. Recovery rates for key construction materials and other construction wastes relevant to the Proposed Development are provided in **Table 16.11**.

Table 16.11: Standard, Good and Best Practice Recovery Rates by Material

Material	Standard Recovery (%)	Practice Good Practice Recovery (%)	Best Practice Recovery (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	Limited information	70	95
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information, cannot be 100% since some hazardous waste e.g., asbestos must be landfilled.	

16.5.2.8 Total Waste Arisings

Total waste arising from the construction of the Proposed Development (4,088 tonnes) would account for <1% of national waste arisings (1,347,462 tonnes), this is assessed to a result in a **Slight / Not Significant** effect and sufficient management capacity is expected to be available.

Overall, a total recovery rate between 68-88% is likely to be achieved for for non-hazardous C&D waste (excluding naturally occurring soil and stones (Waste Code 17 05 04)) managed off-site from buildings and enclosures. A total recovery rate of 75% is likely to be achieved for inert C&D waste arising from roads and parking areas as well as the concrete containment walls.

The majority of the good and best practice recovery rates for the main construction materials provided by WRAP are in excess of 90%. The Proposed Development is therefore likely to achieve 60-89% or 90-99% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. This is assessed to result in a **Slight / Not Significant** effect.

16.5.3 Operational Phase

Waste generated during the operational phase is not expected to generate any other waste than general, commercial, industrial waste and small quantities of municipal waste. All operational wastes are expected to be **Slight / Not Significant** in the context of national waste arisings and significantly less than those arising from the construction of the Proposed Development.

16.6 Mitigation and Monitoring Measures

16.6.1 Environmental Design and Management

A RWMP has been prepared for the Proposed Development, refer to **Appendix A16.1**, Volume 4.

A CEMP has been prepared for the Proposed Development to identify the minimum standards of environmental controls together with monitoring, inspection, and reporting mechanisms to be adopted for all construction works, refer to **Appendix A2.3**, Volume 4. The Contractor will be required to develop a detailed CEMP in advance of the works commencing. The development of the detailed CEMP shall be in conjunction with the CEMP included in the planning application submission.

The RWMP and CEMP include design and construction measures that apply the waste hierarchy principles and minimise effects on waste. These include:

- Planning for the temporary on-site storage of soils, excavated materials and other materials to facilitate reuse.
- Reusing excavated materials within the construction of the Proposed Development, where possible, to minimise the need to import and export material.
- Considering the importation to site of recycled aggregate material, as an alternative to primary aggregate, and establishing procedures to ensure it is uncontaminated.
- Establishing Key Performance Indicators (KPIs) for monitoring and reporting data on waste arising and diversion from landfill.

The RWMP which sets out measures relating to waste management that will be implemented during construction of the Proposed Development. Contractors will implement RWMP in accordance with the EPA *Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects* (EPA, 2021b).

The Contractor will regularly review and update where required the assumptions on waste arisings and management and record and implement procedures for assessing, managing, and recording waste arising on-site. Opportunities for on-site and off-site reuse, recycling and recovery of excavated material and waste will be identified where feasible. Where required, an Article 27 by-product notification will be prepared and submitted for the necessary approvals prior to the commencement of construction works.

16.6.2 Mitigation and Monitoring

As no significant waste effects have been identified, no further or additional mitigation or monitoring of significant effects is proposed.

The RWMP sets out monitoring to be undertaken during the construction phase to ensure that the mitigation measures embedded in the Proposed Development, and those considered essential to mitigate the effects of construction activities, are appropriately implemented.

16.7 Residual Impacts and Effects

Following implementation of mitigation and monitoring measures, the residual effect significance on national waste plans and policies, and national capacity as a result of the waste generated from the Proposed Development is considered to remain **Not Significant**.

16.8 Transboundary Impacts

If necessary, transboundary shipments of waste will be carried out in accordance with the Basel Convention and will require approvals from the competent authorities in Ireland (Dublin City Council) and the receiving country. This may be required in the case of small quantities of hazardous waste for which there is no suitable management route in Ireland (e.g. waste chemicals). Any impacts associated with the management of waste at waste management facilities in countries outside of Ireland are not included in the scope of this assessment, since it is assumed that they will have been assessed and (where necessary) mitigated as part of the planning and permitting of these facilities.

16.9 Cumulative Impacts and Effects

The potential cumulative effects of the Proposed Development in combination with the other projects have been considered in terms of impacts on waste. A full list of planning applications obtained from the search is presented in **Appendix A1.2**, Volume 4. Applications in relation to smaller planning applications predominantly for extensions or alterations to existing dwellings are not considered to be relevant to the cumulative assessment within this EIAR, given their small scale.

Cumulative impacts could arise when considering other projects, however, detailed estimates of waste generation for these projects are not available, and are subject to a separate applications.

Considering that other projects will compliance with relevant Irish policy and legislation e.g. applying the waste hierarchy, it is considered that cumulative impacts on waste management infrastructure capacity are unlikely to be significant during construction.

During operation, none of the projects are expected to generate large quantities of waste when considered in the context of the national waste arisings, and cumulative impacts on waste management infrastructure capacity are unlikely to be significant during operation.

16.10 Summary

The implementation of the mitigation measures outlined in this chapter and the EIAR will ensure that high rates of reuse, recovery and recycling are achieved at the Site of the Proposed Development during the demolition and construction phases.

Following the implementation of the mitigation, there will be **No Residual** effects resulting from the Proposed Development.

16.11 References

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