Environmental Impact Assessment Report

Volume 1 – Non-Technical Summary

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Prepared for: Beauparc Limited

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Chapter 1 – Introduction Non-Technical Summary

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

1. INTRODUCTION

This Non-Technical Summary (NTS) has been prepared to accompany the Environmental Impact Assessment Report (EIAR) prepared on behalf of Knockharley Landfill Limited (herein referred as 'the Applicant') in support of a planning application made to Meath County Council (MCC), for a development in Knockharley, Navan, Co. Meath.

This development will hereafter be referred to as the 'Proposed Development' and primarily consists extension of the existing landfill footprint through the construction of ten (10 no.) additional engineered landfill cells. A full description of the development is provided in Chapter 2 (Description of the Proposed Development) of the EIAR.

The aim of the Environmental Impact Assessment (EIA) approach, in the preparation of an EIAR, is to identify and predict (for a given development) any impacts of consequence; to describe the means and extent by which they can be reduced or ameliorated; to interpret and communicate information about the impacts and to provide an input into the decision making and planning process.

1.1 Relevant Legislative Requirement For Environmental Impact Assessment

Environmental Impact Assessment is an essential tool in the implementation of EU environmental legislation. According to the Guidelines for Planning Authorities and An Coimisiún Pleanála on carrying out Environmental Impact Assessment (August 2018) the objective of the Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA), prior to development consent being given, of public and private developments that are likely to have significant effects on the environment.

The EIA Directive lists projects for which an EIA is mandatory (Annex I) and those projects for which an EIA may be required (Annex II) of the EIA Directive (2011/92/EU and 2014/52/EU), these Annexes are transposed into Schedule 5 of the Planning and Development Regulations 2001 as amended. The EU Member States can choose to apply thresholds for Annex II projects or use a case-by-case examination, or a combination of both, to assess where EIA is required. In Ireland, a combination of both has been applied.

Ireland's type of projects for which an EIA is mandatory is set out in the Schedule 5 Part 1 and Part 2 of the Regulations. The EPA Guidance (2022) requires an assessment beyond the general description of the project and to consider the component parts of the project and/or any processes arising from it. In considering the wider context and the component parts of the Proposed Development AWN have identified the thresholds of relevance to the proposal from Part 1 and Part 2 of Schedule 5; outlined in Table 1-1 and Table 1-2.

Table 1-1 Relevant Part 1 Schedule 5 Thresholds for EIA and determination of requirement of EIA

Development for the Purposes of:	Related Development Details	Exceeds Threshold?
Part 1 – 9. Waste disposal installations for the incineration, chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9, or landfill of hazardous waste (i.e. waste to which Directive 91/689/EEC applies.	The Proposed Development will not include incineration or chemical treatment of hazardous waste. The existing Knockharley Landfill does accept up to 5,000 tonnes of stable non-reactive hazardous waste per annum. The Proposed Development will continue the acceptance of this waste stream The Proposed Development site exceeds the limit, quantity or threshold set out in Part 1 Class 9; therefore, an EIA is mandatory under this Project Class.	Yes – EIA is mandatory under this class.

Table 1-2 Relevant Part 2 Schedule 5 Thresholds for EIA and determination of requirement of EIA

Development for the Purposes of:	Related Development Details	Exceeds Threshold?
Part 2 - 11. Other projects (b) Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule	The Proposed Development includes void space that allows for the continued landfilling of up to 440,000 tonnes per annum. The Proposed Development site exceeds the limit, quantity or threshold set out in Part 2 Class 11 (c); therefore, an EIA is mandatory under this Project Class.	Yes – EIA is mandatory under this class.

1.2 Format Of This Environmental Impact Assessment Report

This EIAR has been laid out using the grouped format structure, the report examines each environmental factor in a separate chapter (the chapters are listed in Table 1-3. These EIAR chapters have been prepared by suitably qualified expert(s) and have considered the construction and operational phases of the Proposed Development under the following headings:

- Assessment Methodology;
- Receiving Environment;
- Characteristics of the Proposed Development;
- Potential Impacts of the Proposed Development;
- Mitigation Measures;
- Monitoring or Reinstatement Measures;

- Residual Effects of the Proposed Development; and
- Cumulative Impacts of the Proposed Development

Interactions between environmental factors will be considered separately in Chapter 15 of this EIAR.

While the EIAR has the focus on the Proposed Development, each specialist chapters also considers the potential cumulative impact (as far as practically possible) of the Proposed Development with the any future development and the cumulative impacts with developments in the locality (including planned and permitted developments).

The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the Guidelines on Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

1.3 Consultation and Scoping

The scope of the EIAR has been defined at an early stage of the design process to ensure that all relevant environmental issues were addressed in the subsequent studies.

To establish the scope, a comprehensive review of the development site's context, including its locality and any previously permitted developments, has been undertaken. This review helped identify the specific matters to be covered within this environmental impact assessment report. By identifying and addressing these issues upfront, the EIAR aims to provide a comprehensive understanding of the potential environmental impacts associated with the Proposed Development.

The structure and presentation of the EIAR is designed to facilitate the dissemination of information to the public and stakeholders. The EIAR is structured in a clear and accessible manner, allowing easy navigation through its content. Additionally, a non-technical summary is provided, which presents a concise overview of the EIAR's main findings and conclusions. The presentation of the information is done in a way that is understandable to both technical experts and non-experts, enabling a wider audience to grasp the key findings and implications of the assessment.

Public participation in the Environmental Impact Assessment (EIA) process is facilitated through the statutory planning application process. As part of this process, the EIAR is made available to the public, allowing interested individuals and organisations to review and comment on the report. This provides an opportunity for public input, ensuring that a wide range of perspectives are considered before making decisions regarding the Proposed Development.

1.4 Additional Assessments Required

The additional reports and/or assessments required under Legalisation or EU Directives other than the Environmental Impact Assessment Directive in respect of the Proposed Development are listed below.

- A Stage 1 and Stage 2 Site-Specific Flood Risk Assessment (FRA) has been prepared by AWN Consulting in accordance with the Planning System and Flood Risk Management Guidelines for Local Government (2009). The site-specific FRA has been included as an appendix to Chapter 6 (Hydrology & Hydrogeology) and is included with the planning application documentation under separate cover.

- A Water Framework Directive (WFD) Screening Assessment has been prepared by AWN Consulting and is included as an appendix to Chapter 6 (Hydrology & Hydrogeology) and is included with the planning application documentation under a separate cover.

- The Appropriate Assessment Screening and Natura Impact Statement has been prepared for the Proposed Development by Scott Cawley ecological consultants and is included with the planning application documentation under separate cover.

Chapter 2 – Description of the Proposed Development Non-Technical Summary

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents a description of the Proposed Development comprising information on the site, design, size and other relevant features of the Proposed Development. The scope of this chapter aligns with the relevant legislation and guidance which comprises the following:

- EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive (2014/52/EU) (herein referred to as the EIA Directive)
- European Commission 'Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report' (2017)
- EPA 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (2022) (herein referred to the as the EPA EIA Report Guidelines 2022).

This chapter summarises the existing site, the Proposed Development, its interaction with elements of the previously permitted but not yet developed extension (ABP PA17.303211)and the existence of the project as set out within the EPA EIA Report Guidelines 2022. This guidance advises that the description of the project should define all aspects of the proposed lifecycle of the facility, including:

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

This chapter draws on and has been informed by the project design and summarises the key relevant details of the Proposed Development and its lifecycle as it relates to the EIAR. This description is not exhaustive, and as such the EIAR should be read in conjunction with the full application package. The Proposed Development is described in this chapter in terms of those environmental topics that will form the basis of the impact assessment process, the characteristics of the Proposed Development and potential effects. The specialist assessments reported in this EIAR have been conducted using this description, and the full application package as a guide to the details of the development under consideration.

2.2 Existing Site and Infrastructure

The Proposed Development site is located within the townlands of Knockharley, Flemingstown and Tuiterath, Navan, Co. Meath and is currently primarily in use as an active landfill. The site is located c. 800m from the N2 National Primary Road and landfill facility has its own private entrance off the N2.

The landfill is primarily surrounded by agricultural land which is the primary land use of the wider region. There are dispersed residential properties in the vicinity of the site, with the nearest residential houses located along the Knockharley road to the immediate north of the site and along the Rathdrinagh/Flemingstown road (L5056) to the east of the site, as well as two sports grounds, the Kentstown Rovers FC pitch to the northwest and Balrath Park football ground to the northeast.

The Knockharley Stream flows west to east through the northern portion of the site and then flows along the eastern boundary of the site where it the travels south /southeast away from the site and joins the Nanny river c. 3km downstream. The Knockharley stream traverses or runs along the boundary of the site for c. 3km. A portion of the Knockharley Stream to the north of the landfill was diverted as part of the permitted ABP-303211-18 application.

The Kentstown Stream (EPA Name: Kentstown 08, EPA Code: 08K18) flow along the southern boundary of the site for c. 90 m before turning south and joining the Knockharley Stream c. 550 m downstream

2.3 Characteristics of the Proposed Development

The Proposed Development comprises the phased extension of the existing landfill footprint through the construction of ten (10 no.) additional engineered landfill cells, including the 'Piggyback Cell'. When the permitted and proposed landfill cells are capped, the Piggyback Cell will infill the void space between the permitted landfill cells 9 – 26 and the proposed landfill cells 31 – 39. This extension will increase the landfill area by approximately 17.68 ha and provide approximately 4.12 million m^3 (3.32 million m^3 of additional constructed void space with further void space of 807,000 m^3 for the 'Piggyback Cell') for the continued disposal of non-hazardous waste and limited quantities of hazardous waste, thereby extending the operational lifespan of the facility.

2.4 Description of Construction

The construction works will be implemented in a phased and controlled manner, in accordance with best practice construction and environmental management standards, to ensure the protection of the surrounding environment and local communities.

Construction works will primarily involve the development of new landfill cells (earthworks and excavations), associated infrastructure (including surface water management systems, gas and leachate collection systems), internal roads, screening berms, and ancillary works, clearance of forestry (c.12.9 ha), and the diversion of the Knockharley Stream. The construction phase will also include the relocation of the existing 220 kV ESB overhead powerline that currently traverses the site, as well as the implementation of landscape and environmental mitigation measures.

While the nature of a landfill facility means that some construction activities are ongoing throughout the operational life of the site (e.g. progressive cell development and capping), the proposed extension will require a defined programme of enabling works and initial infrastructure development prior to the acceptance of waste into the new landfill void.

All construction activities will be carried out under the supervision of suitably qualified personnel and in compliance with relevant planning conditions, the existing Industrial Emissions (IE) licence (W0146-04), and the facility's Environmental Management System (EMS). Measures will be in place throughout the construction period to manage potential impacts such as noise, dust, traffic, and surface water runoff, and to safeguard human health and the environment.

2.5 Operation of the Proposed Development

The proposed activities to be undertaken as a result of the expanded landfill void can broadly be described as:

- placement of waste within lined cells
- management of leachate
- storage of surface water for attenuation prior to discharge
- storage of unsuitable waste in quarantine area prior to removal off-site

Operation of the landfill will be undertaken in compliance with an amendment to the current EPA IED Licence (W0146-04).

2.6 Decommissioning and Remediation of the Project

Decommissioning and remediation will be carried out in accordance with the existing IED Licence (W0146-04), the CRAMP for the facility and the planning application's permitted by the planning authority, including planning conditions.

2.7 Description of the Potential Cumulative Developments

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

The planning search tool was used to generate a list of relevant planning permissions from the surrounding areas of the Proposed Development within the previous five years. The outcome of this search is presented in Appendix 2.1 to this Chapter.

The search also showed a significant number of small extensions, retention and other minor alterations to dwelling houses. These permissions were for established residential properties and businesses within the vicinity of the development. In addition, the search encompassed a number of new one-off dwellings.

Two projects of note in the proximity to the development are the proposed 180 Megawatt gas fired peaking power plant proposed to be located to the immediate southwest of the Proposed Development site and a a planned 165 ha solar farm in the vicinity of the Proposed Development site however this has not yet within the planning system. The project is at non-statutory pre-planning community consultation stage.

As part of the assessment of the impact of the Proposed Development, Chapter 4 – 14 of this EIAR considers the potential for cumulative impact with existing and/or approved projects. There is the potential for short-term and long-term effects, during the construction and operational phases.

Chapter 3 - Alternatives Non-Technical Summary

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3. ALTERNATIVES

3.1 Introduction

Chapter 3 (Alternatives) assesses the evolution of the Proposed Development and the alternatives examined by the Applicant relating to the location, size and scale, and project design and processes of the Proposed Development. This chapter provides a full justification for the Proposed Development and provides a comparison of the environmental effects of each alternative option.

The reasonable alternatives examined throughout the design process are set out as follows:

- Do nothing alternative;
- Alternative project locations;
- Alternative layout, size and scale;
- Alternative processes; and
- Alternative mitigation measures.

3.2 Do-Nothing Scenario

In a do nothing scenario there would be no expansion of the landfill and therefore the void space for landfilling that the Proposed Development would create would not be available in Ireland.

The use of landfills for the disposal of waste is the least preferred option in the waste hierarchy (as defined by EU Waste Framework Directive 2008/98/EC) and Ireland is under the obligation to minimise landfill use. However, due to limitations in processing capacity, contamination in recycling streams, and certain types of non-recoverable waste, landfilling remains a necessary part of Ireland's integrated waste management system and it is necessary to maintain sufficient landfilling capacity for unavoidable waste and unforeseen events (e.g. natural disasters or temporary disruptions to waste-to-energy facilities).

In the absence of the Proposed Development, in the future, Ireland may not have the capacity to undertake landfilling where it is necessary.

EU legislation and National and regional policy documents relevant to waste management are described herein along with details of how the Proposed Development supports their policies and objectives.

3.3 Alternative Project Locations

As noted in Section 4.13 of the 2018 Guidelines *"some projects may be site specific so the consideration of alternative sites may not be relevant."*

We also refer to the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location.

The location of a landfill expansion is tied to the existing Knockharley Landfill and therefore for this development, alternative locations beyond the current Knockharley site are not considered.

3.4 Alternative Layout/Design

The project design team undertook a comprehensive design process to determine an effective and efficient layout for the Proposed Development, which has regard for the operation requirements, planning requirements and the environmental sensitivities of the site and the surrounding context.

Three concepts are examined in Chapter 3 and their relative environmental impacts are discussed.

Concept 3 emerged as the preferred design due to a number of factors which included a less intrusive realignment of the Knockharley Stream and a greater setback distance from residential receptors which may be impacted by odour.

3.5 Alternative Technologies

The Proposed Development is guided by the Applicant's sustainability objectives, in addition to their proven knowledge and expertise as to what landfill technologies are suitable for the existing site and environs. The Applicant are using the best available technology in the selection of excavation strategy, liner materials and installation, construction and operational machinery, gas and leachate management. There are no practical alternatives to these specialised elements of the proposed landfill extension, many of which are pre-determined by the existing design and operations of the existing landfill. Therefore, development of alternative processes is extremely limited.

3.6 Alternative Mitigation

The selected mitigation measures for the Proposed Development are outlined in each of the EIAR Chapters 4 - 14. These measures have been specifically chosen to address the potential environmental impacts of the Proposed Development and to minimise any adverse effects on the environment. By considering a range of mitigation measures and strategies, the specialist team has sought to ensure that the Proposed Development is as environmentally sustainable and responsible as possible.

3.7 Conclusions

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

The layout of the Proposed Development has been carefully selected based on a suitably comprehensive assessment of reasonable alternative layouts and technologies. The Proposed Development presents minimised environmental impacts, while maximising the strategic potential of the site with respect to its use as a landfill.

In conclusion it is considered that the proposed site and chosen layout and design is highly suitable for the Proposed Development.

Chapter 4 - Human Health and Population Non-Technical Summary

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

4. HUMAN HEALTH AND POPULATION

4.1 Introduction

This chapter has been prepared to assess the likely significant impacts on Population and Human Health in respect of the Proposed Development.

Human health should be considered in the context of environmental pathways which may affect health such as air quality, noise, water, and soil quality. All can contribute to negative effects on human health by facilitating the transport of contaminants or pollutants. An evaluation of the effects of these pathways on health, by considering the accepted standards of safety in dose, exposure or risk of air quality and noise levels for example, is considered appropriate, as these standards have been arrived at via scientific and medical research. Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross referenced to provide the Planning Authority with a context for their determination.

4.2 Baseline Environment

4.2.1 Population Health Sensitivity

The Electoral Divisions (ED) included in the Study Area are those containing or within 1km of the proposed development site. In the case of the proposed development, the site is located within the ED of Kentstown (167041) and within 1km of the site are the EDs of Painestown (167071) and Ardmulchan (167004). All three ED's within the study area have seen an overall population growth between the 2016 and 2022 census. The Pobal HP Deprivation Index shows the area to be 'Marginally Above Average' to 'Marginally Below Average' There is a low age dependency ratio, therefore a large proportion of the population is within working age, thus considered as largely independent and judged to be not sensitive to change. A high proportion [56% – 61%] describes their health status as 'Very Good' and a low proportion as 'Bad' or 'Very Bad'. All the ED's in the study area have an overall lower % of persons with a disability than the national average. The population within the study area is therefore not particularly sensitive to change, with a ranking of low to moderate population sensitivity.

4.2.2 Location and Character of the Local Environment

While a general study area of ED within 1 km from the site location is included for population statistics, the wider area of 2.5 km from the site location has been used to inform the baseline description of the area. The Meath County Development Plan 2021–2027 zoning designations have been reviewed, and the Proposed Development site is currently zoned as RA – Rural Area. The zoning objective is: *"To protect and promote in a balanced way, the development of agriculture, forestry and rural-related enterprise, biodiversity, the rural landscape, and the built and cultural heritage."*
In terms of receptor sensitivity to dust soiling, there are between 1-10 no. high sensitivity residential properties within 20m of the proposed development planning boundary.

There are a few primary and secondary schools, along with some commercial facilities, within the study area. However, no healthcare or emergency services are located in the study area. Two places of worship are situated in the vicinity of the proposed development site. There are no protected structures or National Monuments on the site.

The Proposed Development is directly bordered on all sides by rural greenfield lands, interspersed with existing residential dwellings and agricultural properties. The local environment is not considered an area of significant natural resources. The proposed development site is also not at risk of major accidents, natural hazards, or disasters.

4.3 Potential Impacts of the Proposed Development

4.3.1 Construction Phase

The main potential impacts on population and human health from the proposed development are potential for spills/leaks, air and odour emissions, noise, visual, and traffic impacts:

- Construction will have an indirect positive effect on support industries and local services and is considered to have a ***slight, long-term*** and ***positive*** impact on the economy and employment of the local and wider area.
- Construction activities can generate significant noise, dust, and air pollution. These factors can negatively impact the amenity and tranquillity of the surrounding environment. The potential impact is ***negative, moderate-slight,*** and ***long-term.***
- During construction of the proposed development, there is a risk of accidental pollution incidences to land, soil, geology, hydrogeology and hydrology from suspended solids, cement/concrete, and hydrocarbons. The potential impact is ***negative, slight*** and ***long-term.***
- The key elements of construction of the proposed development with potential impacts on populations and human health from air quality and climate impacts are dust soiling effects, dust (PM10 and PM2.5) emissions, engine emissions from construction traffic and changes in traffic flows on nearby road links. In the absence of mitigation, dust impacts on Human Health are predicted to be ***direct, long-term, negative*** and ***slight***.
- As detailed in Chapter 10 (Noise and Vibration), the calculated noise levels are below the adopted CNT and in line with or below the prevailing noise environment, hence the potential noise impact during this phase is ***negative, not significant to moderate*** and ***temporary to long-term.***
- As detailed in Chapter 13 (Traffic and Transportation), it is considered that the predicted increases in traffic during the construction phase of the Proposed Development will have a ***negative***, ***not significant*** and ***short-term*** impact on human health.
- There is a negligible risk of natural disasters or major accidents because of proximity to Seveso sites, and the Proposed Development is classified as appropriate for its flood zonation. The activities of the applicant's contractors during the construction phase will be conducted in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013). The potential effect is therefore ***imperceptible*** and ***unlikely***.

4.3.2 Operational Phase

The main potential impacts on population and human health from the proposed development are potential for spills/leaks, air and odour emissions, noise, visual, and traffic impacts:

- With reference to Chapter 11 (Landscape and Visual Impact), visual and amenity impacts perceived by individual persons are highly subjective and difficult to characterise; however, a total of 12 viewpoints were analysed, and the potential impacts of the Proposed Development on the local population range from ***imperceptible*** to ***moderate slight***.
- As there are no recreational waters, bathing waterbodies, downgradient surface water abstraction points, or designated source protection areas in the vicinity, and no potential for off-site flooding, the operational phase impacts on Population and Human Health, in relation to Hydrology and Hydrogeology, are ***neutral, imperceptible,*** and ***long-term.***
- As outlined in Chapter 8 (Air Quality and Odour), odour dispersion modelling was undertaken to assess potential impacts of the Proposed Development in line with relevant guidance. While exceedances are expected to occur at some of the modelled receptor, they are expected to be occasional and short-lived, as odour dispersion is strongly influenced by varying meteorological conditions such as wind speed and direction. Where exceedances occur, receptors may experience direct, negative, brief, and significant effects. However, given their likely infrequent and short

duration, the overall operational odour impact is assessed as ***direct, negative, long-term,*** and ***slight,*** and therefore ***not significant*** in EIA terms.

- The operational activities associated with the operation of the proposed development will be capable of generating noise to some degree. As per Chapter 10 (Noise and Vibration), the review of the predicted increases in noise level at the nearest noise sensitive locations conclude that the associated impact is likely to be ***negative***, ***slight*** *to* ***moderate*** and ***long term*** in the absence of specific mitigation. The proposed development will not give rise to any significant levels of vibration off site and therefore the associated impact on human health is ***not significant.***
- An assessment of the additional traffic movements associated with the proposed development during the construction and operational phases is presented in Chapter 13 (Traffic and Transportation). The traffic modelling results show that in the absence of mitigation measures, the development traffic will have a ***negative, not significant*** and ***long-term*** impact in comparison to the baseline scenario.
- There is a negligible risk of natural disasters or major accidents because of proximity to Seveso sites, and the proposed development is classified as appropriate for its flood zonation. The potential effect is therefore ***imperceptible*** and ***unlikely.***

4.4 Mitigation and Residual Effects (Post-Mitigation)

4.4.1 Construction Phase

The mitigation measures to address the potential impacts on Population and Human Health from the construction phase of the proposed development and post-mitigation residual effects include:

- As outlined in Chapter 11 (Landscape and Visual Impact), construction-stage mitigation measures are limited, as the site is already well established and heavily screened from surrounding receptors. Therefore, there is no requirement for site hoarding or additional screening, since much of the construction activity will be obscured by existing vegetation. Overall, construction-stage landscape and visual effects are assessed as ***moderate–slight*** and ***negative*** within the immediate vicinity, diminishing rapidly with distance. Residual effects are considered ***not significant.***
- All mitigation measures outlined within Chapter 5 (Land, Soils, Geology) and Chapter 6 (Hydrology and Hydrogeology) will be implemented in accordance with Construction Environmental Management Plan (CEMP), as well as any additional measures required pursuant to planning conditions which may be imposed. The construction phase mitigation measures set out in the CEMP, will be implemented by the construction contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection. The resulting residual effects for Land and Water Emissions are assessed as ***neutral, imperceptible***, and ***long-term.***
- Mitigation measures relating to Air Quality will focus on proactive dust and pollutant control to minimise emissions at source during construction. These measures will ensure compliance with EU ambient air quality limits set to protect human health. As a result, the predicted residual impact is ***long-term, direct, negative, localised*** and ***not significant***.
- Mitigation measures to minimise potential noise and vibration impacts on human health during the construction phase are outlined in Chapter 10 (Noise and Vibration). These include limiting high-noise activities near sensitive boundaries and implementing best practice control measures. Provided these measures are in place, the residual noise impact on human health is determined to be ***negative, not significant*** to ***moderate*** and ***temporary*** to ***long-term.***
- Provided the mitigation measures outlined in Chapter 13 (Traffic and Transportation) are incorporated during the construction phase, the residual impact upon the local population from traffic is predicted to be ***negative, not significant***. and ***long-term.***

4.4.2 Operational Phase

The mitigation measures to address the potential impacts on Population and Human Health from the operational phase of the Proposed Development and post-mitigation residual effects include:

- In terms of landscape impacts, the proposed development is of notable scale and extent but is contained within an existing, established landfill facility and well enclosed by perimeter vegetation. Overall, the proposed development does not conflict with current landscape and visual policies and objectives of the CDP and represents the continuation and intensification of a well-established land use. The operational-phase landscape effect is deemed Moderate, of Negative-Neutral quality, and Permanent in duration. As per Chapter 11 (Landscape and Visual Impact), the residual landscape effects are deemed ***not significant***.
- Implementation of mitigation measures outlined in Chapter 5 (Land, Soils, Geology) and Chapter 6 (Hydrology and Hydrogeology) will ensure that potential impacts on land, soils, geology, surface water, and groundwater during the operational phase are effectively mitigated. As there is no source–pathway linkage, the residual effects are assessed as ***neutral, imperceptible,*** and ***long-term.***
- Detailed odour dispersion modelling of emissions from the Proposed Development predicted exceedances of the relevant odour guideline value at several sensitive receptors. However, taking the likely brief duration and infrequent nature of any potential odour nuisance into account, as well as the required mitigation and monitoring measures outlined in Chapter 8 (Air Quality and Odour), the overall impact of the Proposed Development in terms of air quality and odour can be considered ***direct***, ***negative, long-term*** and ***slight***, which is overall ***not significant*** in EIA terms.
- Considering the implementation of the indicated mitigation measures as outlined in Chapter 10 (Noise and Vibration), the residual noise impact on human health associated with the proposed development operations is expected to be ***negative, not significant to moderate and temporary*** to ***long-term*** at the nearest sensitive receptors.
- The assessment of the additional traffic movements associated with the Proposed Development during the operational phase is presented in Chapter 13 (Traffic and Transportation). With the implementation of these additional mitigation measures, the overall residual operational-phase effect of the Proposed Development on the operation of the surrounding road network will be ***negative, not significant*** and ***long-term.***

4.5 Cumulative Impacts

4.5.1 Construction Phase

Contractors for the proposed development will be contractually required to operate in compliance with a project-specific CEMP, which will include all construction phase mitigation outlined in the EIAR, and Construction Traffic Management Plan which will include the mitigation measures outlined in this EIA Report. The construction phase for the overall development of the applicant owned lands would be restricted by the binding limits for noise, dust, and emissions to water.

4.5.2 Operational Phase

Whilst the proposed development and existing permitted landfill development will present as one of the most notable built developments within the immediate site context, it is not considered that there will be any significant cumulative impacts arising from the proposed development in conjunction with the permitted development or other existing, consented or planned developments.

Chapter 5 – Land, Soils and Geology Non-Technical Summary

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5. LAND, SOILS AND GEOLOGY

5.1 Introduction

The assessment of Land, Soils & Geology is contained within Chapter 5 of the EIAR. This chapter of the EIAR evaluates the likely significant effects, if any, which the proposed development will have on Land, Soils and Geology. This chapter contains necessary information as defined in the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2023).

The chapter initially provides a description of the receiving environment of the site and the potential impacts of the development. When assessing the potential impacts, this assessment considers the significance of the environmental attributes, and the predicted scale, and duration of the likely effects.

The chapter also outlines the proposed mitigation and design measures that will reduce or eliminate the identified potential impacts and defines the residual effects of the proposed development (the effect after the implementation of mitigation measures). effect after the implementation of mitigation measures).

5.2 Baseline Environment

The Proposed Development site is located within the townlands of Knockharley, Flemingstown and Tuitrath, Navan, Co. Meath and is operating as an active licensed landfill. The site is located c. 800m from the N2 National Primary Road and landfill facility has its own private entrance off the N2.

The site is surrounded at all sides by agricultural land which is the primary land use of the wider region. There are dispersed residential properties in the vicinity of the site, with the nearest residential houses located along the Knockharley road to the immediate north of the site and along the Rathdrinagh/Flemingstown road (L5056) to the east of the site.

The site currently comprises a licenced landfill facility (EPA licence W0146-04) where waste disposal and recovery activities are undertaken with waste acceptance commencing in December 2004 and an area of undeveloped land to the west of the landfill. A detailed description of the existing and Proposed Development is outlined in Section 2.2 in Chapter 2 – Description of the Proposed Development of this EIAR.

The site is currently a mix of constructed landfill and associated facilities with some woodland and wet grassland. Soil stockpiles from the excavation of the natural ground for the adjacent landfill are located on the open grassland. Prior to development as a landfill, the land was used for agriculture, and a network of field drains were installed to improve the land.

The Teagasc online mapping (2025) for the site indicates that the soils underlying the site and the surrounding area mainly comprise poorly drained acidic mineral soils consisting of surface water gleys. The northeastern section of the site is underlain with well drained mineral soils north of Flemingstown Stream. Pockets of alluvium have been identified within the site in the northern and southern part of the site.

Based on a review of GSI online mapping, the site is predominantly underlain by tills from Namurian Sandstone and shale in the north and central portion of the site while the southern portion is underlain by tills from Limestones. Alluvium was identified along the northern and southern section of site in the vicinity of the watercourses (GSI, 2025).

According to GSI (2025), it was identified that the site is underlain by Balrickard Formation which is described as coarse Sandstone and Shale rocks. No bedrock outcrops were identified within the site boundary

No geological heritage areas are identified within the site boundary or in close proximity of the site (GSI, 2025). The closest geo-heritage area is located c. 2.5 km north of the site and is identified as Painestown Quarry

The GSI presently classifies the groundwater vulnerability of the entire site as 'Low' vulnerability. Based on the subsoil type and description, the expected depth to bedrock is expected to be greater than 10m.

The landslide susceptibility classification of the site ranges between 'Low' and 'Low Inferred' (GSI, 2025).

5.3 Potential Impacts of the Proposed Development

5.3.1 Do Nothing Scenario

If the proposed development was not constructed, it is likely that the facility will continue to operate as a landfill as permitted. The impact on the land, soils and geology would remain largely unaltered as a result.

5.3.2 Construction Phase

In absence of mitigation measures, the construction phase would present potential impacts associated to the following activities:

- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

Soil requiring removal offsite will be removed from site regularly to ensure there is minimal need for stockpiling. Some of the material will be re-used on site for backfill. It is predicted that excavation of approximately 1.8 million m^3 of material will be required with 367,065 m^3 of material needing to be removed and transported off site and c. 1.44 million m^3 being reused on site for landscaping and berms.

Without the consideration and employment of mitigation measures the potential impacts during the construction phase on land, soils and geology are ***negative, slight*** and ***short term***.

5.3.3 Operational Phase

In absence of mitigation methods but with design measures in place (HDPE Liner for leachate collection and landfill clay liner), the operational phase would not present with any potential impacts.

In the absence of mitigation measures, the potential impacts during the operational phase on land, soils, geology and hydrogeology are ***neutral, Imperceptible***, and ***long-term***.

5.3.4 Decommissioning & Remediation Phase

In absence of mitigation measures, the Decommissioning & Remediation Phase would present potential impacts associated to the following activities:

- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

In the absence of mitigation measures the potential impacts of the Proposed Development during the decommissioning phase on land, soils and geology in accordance with EPA guidelines are ***negative, slight*** and ***short term***.

5.4 Mitigation and Residual Effects (Post-Mitigation)

5.4.1 Construction Phase

In order to reduce impacts on the soils, geological and hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on site.

- Implementation of a Construction Management Plan (CMP);
- Control of soil excavation;
- Sourcing of fill and aggregates
- Surface water management during construction
- Fuel and chemical handling.

The Residual impact on the land, soils and geological environment during the construction phase is ***neutral, imperceptible*** and ***short-term,*** the magnitude of impact is considered ***negligible***.

5.4.2 Operational Phase

A number of design measures will be put in place to minimise the likelihood of any leachate entering the soil and geology environment to include the design of the leachate collection system under the landfill.

There will be an engineered landfill liner and leachate collection system, an under-cell drainage system and leachate recording and monitoring programme. An Environmental Management System currently operates at the facility as required by the licence and includes measures for maintenance, inspections of containment etc, management of monitoring, reporting and spill response training and reporting.

Therefore, the risk of accidental discharge has been adequately addressed through design.

The residual impact on the land, soils and geological environment during the operation phase is ***neutral, imperceptible*** and ***long-term,*** the magnitude of impact is considered ***negligible***.

5.4.3 Decommissioning & Remediation Phase

Decommissioning and remediation will be carried out in accordance with the existing IED Licence (W0146-04), the CRAMP for the facility and the planning applications permitted by the planning authority, including planning conditions.

These mitigation measures will be the same as the Construction Phase mitigation measures apart from:

- Final remediation of leachate collection system once agreed with the EPA

- Rehabilitating hard stand areas and promoting revegetation

The residual effect on soils and geology during the operational phase is considered to be ***neutral, imperceptible*** and ***long-term***, the magnitude of impact is considered ***negligible***.

5.5 Cumulative Impact of the Proposed Development

The cumulative impact of the Proposed Development with any/all relevant other planned or permitted developments are discussed below. For details on the developments considered refer to Chapter 2, Section 2.2.1.1 and Appendix 2.1.

Existing developments that are already built and in operation contribute to the characterisation of the baseline environment. As such any further environmental impacts that the Proposed Development may have in addition to these already constructed and operational developments has been assessed in the preceding sections of this chapter.

Any future application on these lands will be subject to planning approval and environmental assessment as required. Any new development proposed on the lands after the submission of the Proposed Development would be accompanied by an EIA, or EIA Screening as required and take into consideration the development of this site.

5.5.1 Construction Phase

The cumulative impact of the Proposed Development with any/all relevant other planned or permitted developments are discussed below. For details on the developments considered refer to Chapter 2, Section 2.2.1.1 and Appendix 2.1.

Existing developments that are already built and in operation contribute to the characterisation of the baseline environment. As such any further environmental impacts that the Proposed Development may have in addition to these already constructed and operational developments has been assessed in the preceding sections of this chapter.

Any future application on these lands will be subject to planning approval and environmental assessment as required. Any new development proposed on the lands after the submission of the Proposed Development would be accompanied by an EIA, or EIA Screening as required and take into consideration the development of this site.

The residual cumulative impact of the Proposed Development in combination with other planned or permitted developments can therefore be considered to be *neutral, imperceptible* and *short-term*.

5.5.2 Operational Phase

All In relation to the potential cumulative impacts on land, soils, and geology during the operational phase, there is no risk of accidental spills, leaks, and discharges into the underlying soil since all risk is mitigated by design measures. However, the mitigation measures outlined in Section 5.6.2 of Chapter 5 – land, soils and geology will be implemented to prevent and control these risks, ensuring the protection of the soil and the underlying bedrock aquifer.

The implementation of mitigation and monitoring measures detailed in Section 5.6.2 of chapter 5 – land, soils and geology; as well as the compliance of permitted developments listed in Appendix 2.1 of Chapter 2 and any future permitted developments with their respective planning conditions, will ensure the cumulative impact will be not significant to the land, soils and geological environment during the operational phase of the Proposed Development.

The residual cumulative impact of the Proposed Development in combination with other planned or permitted developments can therefore be considered to be *neutral, imperceptible* and *short-term.*

5.5.3 Decommissioning and Remediation Phase

In relation to the potential cumulative impacts on land, soils, and geology during the decommissioning and remediation phase, there is no risk of accidental spills, leaks, and discharges into the underlying soil since all risk is mitigated by design measures. However, the mitigation measures outlined in Section 5.6.3 of chapter 5 of the EIAR will be implemented to prevent and control these risks, ensuring the protection of the soil and the underlying bedrock aquifer.

The implementation of mitigation and monitoring measures detailed in Section 5.6.3 of Chapter 5 of the EIAR; as well as the compliance of permitted developments listed in Appendix 2.1 of Chapter 2 and any future permitted developments with their respective planning conditions, will ensure there will be minimal cumulative potential for impact to the land, soils and geological environment during the decommissioning and remediation phase of the Proposed Development.

The residual cumulative impact of the Proposed Development in combination with other planned or permitted developments can therefore be considered to be *neutral, imperceptible* and *short-term.*

Chapter 6 – Hydrology and Hydrogeology Non-Technical Summary

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6. HYDROLOGY AND HYDROGEOLOGY

6.1 Introduction

The assessment of Hydrology & Hydrogeology is contained within Chapter 6 of the EIAR. This chapter of the EIAR evaluates the likely significant effects, if any, which the proposed development will have on the hydrological and hydrogeological environment. This chapter contains necessary information as defined in the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022).

The chapter initially provides a description of the receiving environment of the site and the potential impacts of the development. When assessing the potential impacts, this assessment considers the significance of the environmental attributes, and the predicted scale, and duration of the likely effects.

The chapter also outlines the proposed mitigation and design measures that will reduce or eliminate the identified potential impacts and defines the residual effects of the proposed development (the effect after the implementation of mitigation measures). effect after the implementation of mitigation measures).

6.2 Baseline Environment

The proposed developed is located within the townlands of Knockharley, Flemingstown and Tuitrath, Navan, Co. Meath and part of the site is operating as an active licensed landfill. The site is located c. 800m from the N2 National Primary Road and landfill facility has its own private entrance off the N2.

The proposed development site is located within the former Eastern River Basin District (now the Irish River Basin District). The proposed development site lies within the Nanny-Delvin Catchment and the Nanny Sub-Catchment.

The Knockharley Stream flows west to east through the northern portion of the site and then flows along the eastern boundary of the site where it travels south /southeast away from the site and joins the Nanny River c. 3km downstream. The Knockharley Stream traverses or runs along the boundary of the site for c. 3km. A portion of the Knockharley Stream to the north of the landfill was diverted as part of the permitted ABP-303211-18 application.

The Kentstown Stream flows along the southern boundary of the site for c. 90 m before turning south and joining the Knockharley Stream c. 550 m downstream as shown

The site currently comprises a licensed landfill facility (IED Licence W0146-04) where waste disposal and recovery activities are undertaken with waste acceptance commencing in December 2004. A detailed description of the existing development is outlined in Section 2.2 in Chapter 2 – Description of the Proposed Development of this EIAR.

The current surface water infrastructure system on the landfill site is split into two catchments: the northern catchment system, which includes a holding pond, the northern attenuation pond and wetland; and the southern catchment system which includes the southern attenuation pond and wetland. The proposed development will continue to drain to both these catchments for surface water management.

Swales are vegetated channels over which flows are conveyed at low non-erosive velocities to store and convey run-off and remove any collected pollutants. The existing swales drain collected rainwater run-off from capped areas of the landfill and the perimeter of the landfill footprint, IBA cell footprint and embankments surrounding the cells. These swales are of approximate depth 600 mm with a bottom width of 1000 mm and side slopes of 1 in 3. As the landfill cells develop further, the surface water swales will continue to be constructed around the landfill footprint and embankments.

Surface water from the landfill footprint is drained via the main landfill perimeter swale to a purpose-built storm water attenuation pond and constructed wetland to the south of the site – known as the southern attenuation pond and wetlands. Surface water runoff from roads and hard standing areas discharge to a surface water trunk main collection pipe. This surface water trunk is located on the eastern side of the perimeter access road and runs between the administration building to the southern surface water attenuation pond. This below ground pipe main varies from 225 mm diameter up to 750 mm diameter. There is also a 450 mm diameter spur from this pipe main to the north of the permitted C&D Fines Treatment Facility building which runs from east to west and turns north to receive runoff from the main site access road. The pipe discharges to an existing attenuation pond and wetland at the south of the site, via a Class 1 bypass proprietary oil/water separator. This petrol interceptor treats any accidental discharge of hydrocarbons within stormwater run-off prior to stormwater run-off discharging to the attenuation pond and further treatment provided by a wetland.

The Knockharley Stream, the Kentstown stream and the Veldonstown Stream belong to the River Nanny [Meath] _SC_010 WFD surface river waterbody (European Code: IE_EA_08N010280). This river waterbody has a most recent WFD surface water status (WFD Period: 2016-2021) of '*Poor*' and its current WFD risk score (3rd risk cycle) of '*At risk*' of not achieving good status. The EPA have identified that the '*Poor*' status is related to its ecological status or potential, biological status or potential and supporting chemistry conditions.

A review of the Environmental Protection Agency's (EPA) online mapping that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has shown that there are no Recreational Waters or Bathing Waterbodies or public water supplies located in the vicinity of the site.

A Site-Specific Flood Risk Assessment (SSFRA) has been undertaken for the proposed development by AWN in August 2025. The assessment has identified that the proposed layout is located primarily in Flood Zone C. However, Flood Zones A and B extents are present within the site, associated with the existing northern settlement pond and southern wetland, respectively. Following the required Justification Test as required under DECLG/OPW Guidelines, it is concluded that no residual risk is foreseen as the proposed development will not affect the existing hydrological, morphological and hydraulic conditions that define the aforementioned Flood Zones. The proposed drainage system has been designed to accommodate the 1% AEP plus 20% increase due to climate change during operation and 30% post closure. The proposed layout will also have capacity to control and attenuate the 0.1% AEP event without additional flooding risk. The risk from pluvial, coastal and groundwater sources is considered low.

The River Nanny Estuary and Shore SPA and North-west Irish Sea SPA lie approximately 22km and 27.8km downstream from the proposed development, respectively. Balrath Woods pNHA (Site Code: 001519) located c. 550m south (linear distance) and c.800m downstream from the site. The pNHA has a direct hydrological connection through Knockharley Stream which transverses the pNHA before flowing in a south early direction and discharging to the River Nanny.

The Groundwater Body (GWB) underlying the site is Realtage GWB (European Code: IE_EA_G_020). The bedrock aquifer underlying the proposed development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map, is classified as a "*Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones*".

The GSI presently classifies the groundwater vulnerability of the entire site as 'Low' vulnerability.
There are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas in the vicinity of the proposed development site.

The groundwater flow direction likely follows the local topography to Knockharley and Kentstown Stream contributing to their baseflow and ultimately to River Nanny. The regional groundwater flow direction is from northwest to southeast.

Presently, the groundwater body in the region of the site (Realtage GWB - European Code: IE_EA_G_020) for which the site is located entirely within, has a WFD status of "*Good*" (WFD Period: 2016-2021) and a WFD risk score (3rd Cycle) of "*Not at Risk*" of not achieving good status, meaning it has achieved its objectives end the overall status is considered good.

The local groundwater quality was assessed from site sampling and testing which was carried out in 2025. No exceedances were identified in PAH's, TPH's, SVOC's, VOC's and Total phenols when compared to IGV's and GTV's. All heavy metals concentrations were recorded below the IGV's and TV's with the exception of manganese and Barium which exceeded the IGV's and no TV's are available for these parameters. However, the levels were marginally above the screening criteria. The likely cause for elevated levels of manganese is naturally occurring manganese within the soil and bedrock.

6.3 Potential Impacts of the Proposed Development

6.3.1 Construction Phase

In absence of mitigation measures, the construction phase would present potential impacts associated with the following activities:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
- Excavations/ top and sub soil stripping- Increase sediment run off (erosion during rainfall periods), Pollutant mobilisation (heavy metal runoff), Loss of vegetation;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms. Construction phase sewerage will be contained in a tank and taken by tanker off site for disposal at a licensed waste management facility.

There is a potential for temporary slight impact on Knockharley stream due to construction activities from the proposed diversion and construction of culvert.

This is a potential for temporary impact on aquifer vulnerability, as part of the proposed development excavations will be required down to 54mOD for the construction of landfill cells. This will temporarily increase the aquifer vulnerability which is classified by the GSI as having 'Low' (L) to 'Moderate' (m) vulnerability in the northeastern of the proposed landfill extension. However, as part of the proposed extension the bottom of the cells will be lined with an impermeable Clay liner which increases aquifer protection.

Without the consideration and employment of mitigation measures, the potential impacts during the construction phase on surface water and groundwater quality are ***negative***, ***slight,*** and ***long term.***

6.3.2 Operational Phase

There is no potential for significant impacts to surface water and groundwater quality during the operational phase due to the implementation of design measures already in place for the existing landfill.

As is current practice on site, there will be an engineered landfill liner and leachate collection system, an under cell drainage system and leachate recording and monitoring programme.

A network of foul drainage collects foul waste from the existing buildings and is treated in the biotreatment plant on site prior to discharge into the waste leachate lagoon which is then tankered offsite for further treatment.

Any leakage of hydrocarbons from operational equipment or traffic will drain and be treated in interceptors on site. There is a small potential for localised temporary impacts if accidental leaks occur outside the drainage infrastructure on site.

The construction of landfill cells and installation of an impermeable clay liner, introduction of impermeable surfaces will reduce locally the recharge to the aquifer. However, there will be no measurable change as the recharge is already very low due to the low permeability nature and thickness of the clayey till present.

There is a potential for a slight change in groundwater flow paths locally. However, there will be no impact or change in the overall regime of groundwater flows within the aquifer and the underlying Realtage GWB considering the proportion of the site area in relation to the total aquifer area.

There will be no change to on site or off site flooding. The proposed design has incorporated adequate attenuation in the project design.

In the absence of mitigation measures, the potential impacts during the operational phase are ***neutral***, ***not significant*** and ***long term***.

6.3.3 Decommissioning and Remediation Phase

The potential impacts arising during the final landfill capping will be similar in nature to those identified during the Construction Phase. The primary impact is the potential for a localised spill/leak during decommissioning and restoration works which will include capping of the landfill cells across the site.

In the absence of mitigation measures the potential impacts during the decommissioning phase due to the potential for contamination of receiving waters are ***negative***, ***slight*** and ***long term***.

6.4 Mitigation and Residual Effects (Post-Mitigation)

6.4.1 Construction Phase

In order to reduce impacts on the hydrological and hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on site.

- Implementation of a Construction Management Plan (CEMP).
- Fuel and chemical handling.
- Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, attenuation pond) and use of riparian zone along the stream.
- Surface water and wastewater management infrastructure.

The predicted residual impact on the hydrological and hydrogeological environment with mitigation during the construction phase is ***neutral, imperceptible*** and ***long-term,*** the magnitude of impact is considered ***negligible***.

6.4.2 Operational Phase

The design has taken account of the potential impacts of the development on surface water and groundwater quality; measures have been incorporated in the design to mitigate these potential impacts.

As current, there will be an engineered landfill liner and leachate collection system, an under cell drainage system and leachate recording and monitoring programme.

- The existing surface water management infrastructure will be extended and maintained during the operational phase of the Proposed Development. The infrastructure is capable of the following:

- Collection/diversion of any contaminated run-off arising within the installation. An actuated penstock is in place to prevent surface water discharging into the next pond, constructed wetland or receiving water in the event that monitoring should indicate contamination of the surface water;
- the prevention of contaminated water and leachate discharges into surface water drains and courses;
- the collection/diversion of run off arising from capped and restored areas, incorporating adequately sized swales.
- Discharge from attenuation ponds is further treated through constructed wetlands before discharge to streams.
- The inlet to the northern surface water holding pond and southern attenuation pond includes Class I Full Oil Interceptor.
- The northern and southern attenuation ponds discharge to wetlands for secondary retention and treatment prior to discharge.

- All foul effluent generated from administration welfare facilities is collected onsite and passed through a Bio-Cycle treatment unit. Any effluent from this unit is discharged to the waste leachate lagoon and is tankered offsite for further treatment.

- The design of the development and its drainage infrastructure will ensure that runoff rates are restricted to those of greenfield conditions.

The predicted residual impact on the hydrological and hydrogeological environment with mitigation during the construction phase is ***neutral, imperceptible*** and ***long-term***, the magnitude of impact is considered ***negligible.***

6.4.3 Decommissioning and Remediation Phase

The mitigation measures applied during the decommissioning and remediation phase will be same as outlined in the construction phase apart from:

- Final remediation of leachate collection system will be designed and undertaken in accordance with the existing EPA licence requirements
- Hardstand areas will be rehabilitated and revegetation in line with the agreed restoration plan.

In relation to site activities post-completion of landfilling, mitigation will be in line with the Closure, Restoration and Aftercare Management Plan (CRAMP) as per EPA requirements and respond to the potential impacts identified.

The predicted residual impact on the hydrological and hydrogeological environment with mitigation during the decommissioning phase is ***neutral, imperceptible*** and ***long-term***, the magnitude of impact is considered ***negligible.***

6.5 Cumulative Impact of the Proposed Development

6.5.1 Construction Phase

The works contractors for other planned or permitted developments as set out in Chapter 2 and Appendix 2.1 of this EIA Report. will be obliged to ensure that measures are in place to protect water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019).

The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be ***neutral, imperceptible*** and ***long-term***.

6.5.2 Operational Phase

Increased impermeable areas will reduce local recharge to ground and increase surface water run-off potential if not limited to the green field run-off rate from the site. Cumulatively the Proposed Development and others in the area will result in localised reduced recharge to ground and increase in surface run-off. However, the existing drainage system on site aims to store any excess run off without impacting the current discharge rates to the surrounding water bodies.

All the operational cumulative developments are required to manage discharges in accordance with S.I 272/2009 and 77/2019 amendments. The implementation of mitigation and monitoring measures detailed in Section 6.6.1; and 6.7.1 of this EIA as well as the compliance of the other permitted developments with their respective planning conditions, will ensure there will be minimal cumulative potential for change in surface water during the operational phase of the proposed development. As such there will be no cumulative impact to surface water and groundwater quality and therefore there will be no cumulative impact on the surface waterbody status.

The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be *neutral, imperceptible* and *long-term*.

6.5.3 Decommissioning and Remediation Phase

The potential for cumulative impacts during the Decommissioning and Remediation Phase has been considered; however, there are no known projects or developments that could interact with the site given the long-term time horizon for this phase. The existing landfill forms part of the baseline environment, and the proposed development represents an extension to that activity. Key site-specific activities during the Decommissioning and Remediation Phase are consistent with those required for the existing landfill and include:

- Final landfill capping, undertaken in accordance with the CEMP;
- Ongoing post- landfilling site activities, carried out in accordance with the CRAMP.

Through implementation of the CEMP and CRAMP, adherence to EPA guidance, and regulatory oversight, decommissioning and remediation will be managed to ensure that no significant environmental effects arise. Given the long-term time horizon, any future proposed developments will be required to ensure that cumulative impacts in combination with this development remain at an acceptable level.

The residual cumulative impact of the Proposed Development in combination with other planned or permitted developments can therefore be considered to be *neutral, imperceptible* and *long-term.*

Chapter 7 – Biodiversity Non-Technical Summary

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7. BIODIVERSITY

7.1 Introduction

The biodiversity assessment considered the potential impacts of the Proposed Development on biodiversity. The Assessment involved a review of available published data to identify any features of ecological value and field surveys of water quality, habitats, bats, terrestrial mammals, and wintering and breeding birds.

7.2 Baseline Environment

The receiving environment includes 135.2 hectare land holding with the existing landfill footprint positioned near its centre. The existing site includes a mixture of built land, screening forest, bare ground, agricultural grassland, unmanaged grassland, hedgerows, treelines, and scrub. Other habitats in the surrounding environment include watercourses, swamps, streams, drains and ditches.

The Proposed Development does not overlap with any European sites, it is however hydrologically connected to the River Nanny Shore and Estuary SPA and North-west Irish Sea SPA. The River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA are the closest European sites and are located c. 4km north of the Proposed Development, however there is no connectivity to these European sites.

7.3 Potential Impacts of the Proposed Development

7.3.1 Construction Phase

The potential impacts on biodiversity assessed for the construction phase include:

- Habitat loss and fragmentation – there will be habitat loss as a result of the construction and establishment of Proposed Development. In total this will be 25.2 ha of habitat with 12.9ha being planted forestry on the site. The Proposed Development will involve the preparation and creation of the new void for landfilling. Some habitat loss will occur in areas where there is forestry clearance, establishment of access routes and new electricity pylons, and the diversion of Knockharley Stream.
- Habitat degradation / effects as a result of hydrological impacts – surface water run-off and discharges from the Proposed Development will drain into the existing local surface water drainage network. In the absence of mitigation measures, due to the proximity of surface water features to the Proposed Development, the associated effects of a reduction of surface water quality could extend downstream for a considerable distance from the discharge point or from the location of a pollution event, resulting in a potential undermining of the conservation objectives of the European sites in the vicinity of the Proposed Development.
- Disturbance/displacement – construction related disturbance and displacement of fauna species could potentially occur within the vicinity of the Proposed Development. Noise levels associated with construction activity are expected to be within the range that would provoke a moderate effect of response from birds – i.e. birds becoming alert and reduction in feeding activity. Vegetation clearance will be undertaken in the appropriate time (i.e. outside of the breeding bird season) to ensure that breeding birds have adequate time in which to identify alternative vegetation in which to establish nests.

7.3.2 Operational Phase

The potential impacts on biodiversity assessed for the operation phase include:

- Habitat degradation – surface water – The hydrological connection between the Proposed Development and downstream European Designated Sites means there is potential for release of contaminated surface water run-off and / or accidental spillage or pollution event into any surface

water feature during operational phase. This has the potential to affect water quality in the receiving aquatic environment and potentially undermine the conservation objectives of the associated European Designated sites.

- Habitat degradation as a result of introducing / spreading non-native invasive species – There is potential for non-native invasive species to be spread or to be introduced resulting in the degradation of habitat areas within the Proposed Development.

7.4 Mitigation and Residual Effects (Post-Mitigation)

7.4.1 Construction Phase

Mitigation measures proposed for the potential impact on biodiversity assessed for the construction phase include:

- Habitat degradation / effects as a result of hydrological impacts – surface water run-off and discharges from the Proposed Development will drain into the existing local surface water drainage network. Mitigation measures to prevent such a case include a Surface Water Management Plan which is included as part of the Construction Environmental Management Plan (CEMP). Following the full implementation of the mitigation measures the Proposed development will not result in any significant residual effects.

7.4.2 Operational Phase

Mitigation measures proposed for the potential impacts on biodiversity assessed for the operational phase include:

- Habitat degradation – surface water – The hydrological connection between the Proposed Development and downstream European Designated Sites means there is potential for release of contaminated surface water run-off and / or accidental spillage or pollution event into any surface water feature during operational phase. This has the potential to affect water quality in the receiving aquatic environment and potentially undermine the conservation objectives of the associated European Designated sites. Measures to control the risk of flooding and contamination to local waterbodies and the hydrological environment have been included within the design of the Proposed Development. Following the full implementation of the mitigation measures the Proposed development will not result in any significant residual effects.
- Habitat degradation as a result of introducing / spreading non-native invasive species – There is potential for non-native invasive species to be spread or to be introduced resulting in the degradation of habitat areas within the Proposed Development. Mitigation measures to be implemented include a confirmatory pre-construction non-native invasive species survey to confirm presence/absence and extent of all Third Schedule non-native invasive species within the footprint. The invasive species management plan will then be updated and all control measures within the management plan will be implemented by a suitably qualified and licensed specialist prior to construction of the Proposed Development. Following the full implementation of the mitigation measures the Proposed development will not result in any significant residual effects.
- It is planned for c. 7.26 ha of woodland to be planted to compensate for habitat loss during the operational phase and a further c. 1.6 ha will be planted during the reinstatement phase. This will enhance the existing woodland areas existing within the Proposed Development. There is not sufficient land within the Proposed Development to plant compensatory forest habitat, therefore 4.04 ha of land will need to be sourced offsite.

7.5 Cumulative Impact of the Proposed Development

Cumulative effects is defined in the EPA (2022) guidance as "The addition of many minor or insignificant effects, including the effects of other projects, to create larger, more significant effects".

Information on the relevant projects within the vicinity of the proposed development is described in Appendix 2.1 of Chapter 2 of this EIAR. The information was sourced from a search of the local authorities planning registers, EPA website, planning applications, EIAR documents and planning drawings which facilitated the identification of past and future projects, their activities and their potential environmental impacts. Key projects with the potential for cumulative effects are described further below.

7.5.1 Projects

Curraghtown Gas-fired power plant (Planning ref: Meath County Council - 2460842)

The proposed development consists of a 180 Megawatt gas-fired power plant, consisting of 3 no. open cycle gas turbines and a Liquid fuel storage facility. This development is planned to be located west of Knockharley landfill, directly adjacent to the site. The site is currently is 7.9ha of agricultural land. An EIA of the proposed development was undertaken (BES, 2024) and identified potential impacts which included; Habitat loss and Disturbance. The EIA concluded that the proposed power plant will be constructed and operated in strict accordance with the design, best practise, and mitigation as described within the application, and as such significant effects on ecology are not anticipated. Considering the above and the lack of connectivity, there is therefore no potential cumulative effects within the proposed development under appraisal in this report.

Highfield Solar Limited Solar Farm (Planning ref: Meath County Council – 23576 LB/160898)

The consented development consists of a 150.29 hectares of ground-mounted Solar PV panels, two electrical substation buildings and 69 electrical transformer and inverter station modules. The site was primarily agricultural grassland. An EIA of the development and identified potential impacts which included; Habitat loss, Disturbance, and Contamination. The EIA concluded that with the implementation of mitigation measures, the solar farm would not significantly impact local fauna and flora. Considering the above and the lack of connectivity, there is therefore no potential cumulative effects within the proposed development under appraisal in this report.

Highfield Solar Limited Solar Farm (Not submitted currently)

The proposed development consists of a 165 hectares of ground-mounted Solar PV panels. The site is currently primarily agricultural grassland. The proposed development has not been submitted for planning yet. As there has been no assessment of the site, it is proposed that the potential impacts include; Habitat loss and Disturbance. The implementation of mitigation measures should prevent any significantly impact to local fauna and flora. Considering the above and the lack of connectivity, there is therefore no potential cumulative effects within the proposed development under appraisal in this report.

Chapter 8 – Air Quality and Odour Non-Technical Summary

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

9. AIR QUALITY AND ODOUR

The assessment of Air Quality and Odour is contained within Chapter 8 of Volume II.

9.1 Existing Environment

Baseline data and data available from similar environments indicates that levels of nitrogen dioxide (NO_2), particulate matter less than 10 microns (PM_{10}) and particulate matter less than 2.5 microns ($PM_{2.5}$) and are generally well below the National and European Union (EU) ambient air quality standards.

The assessment of baseline air quality in the region of the proposed development has shown that current levels of key pollutants are significantly lower than their limit values. Due to the size, nature and location of the proposed development, increased road traffic emissions resulting from construction and maintenance of the proposed development are expected to have a negligible impact on air quality.

9.2 Impact Assessment

9.2.1 Do Nothing Scenario

Under the Do Nothing Scenario the proposed development will not be constructed, no construction works associated with the proposed development will take place and the previously identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. The operational emissions of odour associated with the Proposed Development will also not occur.

However, the existing Knockharley Landfill Limited Installation is currently licensed by the EPA under Industrial Emissions Licence Reg. No. W0146-04. The odour emissions associated with the existing licence conditions represents the Do Nothing scenario. The landfill areas under the existing licence conditions will be capped once filled and landfill gas production and associated odour emissions from these areas will reduce over time.

9.2.2 Construction Phase

An assessment of the potential dust impacts as a result of the construction phase of the proposed development was carried out based on the UK Institute for Air Quality Management 2024 guidance document *'Guidance on the assessment of Dust from Demolition and Construction'*. This established the sensitivity of the area to impacts from construction dust in terms of dust soiling of property, human health and ecological effects. The surrounding area was assessed as being of medium sensitivity to dust soiling and of low sensitivity to dust-related human health effects.

The sensitivity of the area was combined with the dust emission magnitude for the site from earthworks activities and trackout (movement of vehicles) to determine the mitigation measures necessary to avoid significant dust impacts. It was determined that there is at most a high risk of dust related impacts associated with the proposed development. In the absence of mitigation there is the potential for ***direct, short-term, negative,*** and ***slight*** impacts to air quality.

In addition, construction phase traffic emissions have the potential to impact air quality, particularly due to the increase in the number of HGVs accessing the site. Construction stage traffic did not meet the scoping criteria for a detailed modelling assessment outlined in Transport Infrastructure Ireland's 2022 guidance document *'Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106'.* As a result a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment and the construction stage traffic emissions will not have a significant effect on air quality.

9.2.3 Operational Phase

Operational phase traffic has the potential to impact air quality due to vehicle exhaust emissions as a result of the increased number of vehicles accessing the site. The change in traffic associated with the operational phase of the proposed development met the PE-ENV-01106 criteria requiring a detailed air dispersion modelling assessment. As a result a detailed air assessment of operational stage traffic emissions has been scoped out from any further assessment and the operational stage traffic emissions will not have a significant effect on air quality.

The operational assessment involved dispersion modelling of odour emissions from the additional proposed landfill cells as part of the proposed development. The assessment evaluated the impacts of odour emissions at nearby residential properties. The dispersion modelling predicted exceedances of the relevant odour guideline value at several sensitive receptors which may experience direct, negative, brief and significant effects due to odour nuisance. However, taking the likely brief duration and infrequent nature of any potential odour nuisance into account, as well as the required mitigation and monitoring measures outlined in Section 8.10.2 and Section 8.11.2 of Chapter 8 Air Quality, the overall impact of the proposed development in terms of odour can be considered ***direct***, ***negative, long-term*** and ***slight***, which is overall ***not significant*** in EIA terms.

9.2.4 Mitigation

9.2.5 Construction Phase

Detailed dust mitigation measures are outlined within Section 8.10 of Chapter 8 and also included in the Construction Environmental Management Plan to ensure that no significant nuisance as a result of construction dust emissions from demolition, earthworks, construction and trackout (movement of vehicles) occurs at nearby sensitive receptors. Once these best practice mitigation measures, derived from the Institute for Air Quality Management 2024 guidance '*Guidance on the Assessment of Dust from Demolition and Construction'* as well as other relevant dust management guidance, are implemented the impacts to air quality during the construction of the proposed development are considered ***direct, short-term, localised, negative*** and ***not significant***, posing no nuisance at nearby sensitive receptors (such as local residences).

9.2.6 Operational Phase

The existing Knockharley Landfill facility has an existing IED Licence (W0146-04) issued by the EPA. The facility is required to comply with specific licence conditions, including monitoring and reporting on their emissions (such as emissions to air and odour), to ensure that they do not pose a risk to human health or the environment.

9.3 Residual Impact Assessment

When the dust mitigation measures detailed in the mitigation section (Section 8.10) are implemented, the residual effect of fugitive emissions of dust and particulate matter from the site will be ***short-term, direct, localised, negative*** and ***not significant*** in nature and will pose no nuisance at nearby receptors.

Detailed odour dispersion modelling of emissions from the proposed development predicted exceedances of the relevant odour guideline value at several sensitive receptors which may experience direct, negative, brief and significant effects due to odour nuisance. However, taking the likely brief duration and infrequent nature of any potential odour nuisance into account, as well as the required mitigation and monitoring measures outlined in Section 8.10.2 and Section 8.11.2 Chapter 8 Air Quality, the overall impact of the proposed development in terms of odour can be considered ***direct***, ***negative, long-term*** and ***slight***, which is overall ***not significant*** in EIA terms.

9.4 Monitoring

Monitoring of the dust mitigation measures will be required as set out in Section 8.10 of Chapter 8 and the Construction Environmental Management Plan. The monitoring requirements will ensure that the dust mitigation measures are working satisfactorily.

The existing Knockharley Landfill facility has an existing IED Licence (W0146-04) issued by the EPA. The facility is required to comply with specific licence conditions, including monitoring and reporting on their emissions (such as emissions to air and odour), to ensure that they do not pose a risk to human health or the environment.

9.5 Cumulative Impact

There is the potential for cumulative impacts to air quality should the construction phase of the proposed development coincide with that of other developments within 500m of the site. A review of proposed/permitted developments in the vicinity of the site was undertaken and relevant developments with the potential for cumulative impacts were identified.

There is at most a high risk of dust impacts associated with the proposed development. The dust mitigation measures outlined in Section 8.10 of Chapter 8 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development and the permitted cumulative developments are deemed ***direct, short-term, localised, negative*** and ***not significant.***

There are no permitted development or EPA licenced facilities within 1 km of the proposed development with the potential for significant cumulative effects due to odour emissions.

Overall no significant impacts to air quality are predicted during the construction or operational phases of the proposed development.

Chapter 9 – Climate Non-Technical Summary

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

9. CLIMATE

9.1 Introduction

The assessment of Climate is contained within Chapter 9 of Volume II.

9.2 Baseline Environment

Anthropogenic emissions of greenhouse gases (GHGs) in Ireland included in the European Union's Effort Sharing Regulation (ESR) (EU 2018/842) are outlined in the most recent review by the EPA which details emissions up to 2024 (EPA, 2025a). The greenhouse gas emission inventory for 2024 is the fourth of ten years over which compliance with targets set in the ESR will be assessed. This Regulation sets 2030 targets for emissions outside of the Emissions Trading System (known as ESR emissions) and annual binding national limits for the period 2021-2030. Ireland's target is to reduce ESR emissions by 42% by 2030 compared with 2005 levels, with a number of flexibilities available to assist in achieving this. Ireland's 2024 GHG ESR emissions are 42.42 Mt CO_2eq, this is 3.74 Mt CO_2eq more than the annual limit for 2024 (EPA, 2025a). Agriculture continues to be the largest contributor to overall emissions at 38% of the total. Transport, energy industries and the residential sector are the next largest contributors, at 21.7%, 13.3% and 10.4%, respectively. Others (including waste) accounted for 1.63 Mt CO_2eq in 2024.

9.3 Potential Impacts of the Proposed Development

9.3.1 Do Nothing Scenario

Under the Do Nothing Scenario the proposed development will not be constructed, no construction works associated with the proposed development will take place and the previously identified impacts of greenhouse gas emissions from the Proposed Development will not occur.

However, the existing Knockharley Landfill Limited Installation is currently licensed by the EPA under Industrial Emissions Licence Reg. No. W0146-04. The greenhouse gas emissions associated with the existing licence conditions represents the Do Nothing scenario. The landfill areas under the existing licence conditions will be capped once filled and landfill gas production and associated greenhouse gas emissions from these areas will reduce over time.

9.3.2 Construction Phase

Construction traffic would be expected to be the dominant source of greenhouse gas emissions during this phase of the Proposed Development. Construction vehicles and machinery will give rise to CO_2 and N_2O emissions during construction of the Proposed Development. The Institute of Air Quality Management document '*Guidance on the Assessment of Dust from Demolition and Construction'* (IAQM, 2024) states that site traffic and plant is unlikely to make a significant impact on climate.

It is important to note that the potential impacts associated with the construction phase of the Proposed Development are short-term in nature. When the mitigation measures are implemented, GHG emissions from the site will not be significant.

Once the mitigation measures are implemented, the residual impacts on climate from the Construction Phase of the Proposed Development will remain ***direct, medium-term, imperceptibly negative*** and ***not significant.***

9.3.3 Operational Phase

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. A flood risk assessment has been undertaken on the site and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. Therefore, the impact of climate on the Proposed Development will be *imperceptible,* which is not significant. It can therefore be determined that the impact of climate change on the Operational Phase will be a residual ***direct, long-term, imperceptibly negative*** and ***not significant*** effect.

The criteria for determining the significance of effects for the operational phase of the Proposed Development on climate is a two-stage process that involves defining the magnitude of the impacts first followed by the sensitivity of the receptors. In relation to climate, as there are no project specific assessment criteria, the Proposed Development has been assessed against the recommended ISEP (ISEP, 2022) significance determination.

In reference to Principle 1 of ISEP Guidance (ISEP, 2022), the Proposed Development will be a continuation of the existing baseline activity with no increase in tonnage or traffic and thus GHG emissions are essentially unchanged from the baseline scenario.

In reference to Principle 2 of ISEP Guidance (ISEP, 2022), a range of measures will be employed which will reduce GHG emissions and are in line with "best practice". The site specific mitigation which will be employed include:

- The impact of the landfill emissions is mitigated by the collection of the landfill gases emitted to produce electricity. A landfill gas collection system will be installed to safely collect and divert this gas from the new landfill to the existing landfill gas management compound which includes landfill gas flares and landfill gas utilisation plant (LGUP) which generates electricity. The amount generated will vary throughout the lifespan of the landfill as the waste decomposes although during the operation phase is likely to amount to approximately 13000 MWh/year.

In reference to Principle 3, as GHG emissions are essentially unchanged from the baseline scenario no compensation measures are deemed necessary.

Once the mitigation measures are implemented, the residual impacts on climate from the Operational Phase of the Proposed Development will be ***direct, long-term, negative*** and ***minor adverse.***

Thus, in terms of the residual impacts on climate from both the construction phase and operational phase of the Proposed Development will be ***not significant***.

9.4 Mitigation and Residual Effects (Post-Mitigation)

9.4.1 Construction Phase

Detailed mitigation measures are outlined within Section 9.6.1 of Chapter 9 and are also included in the Construction Environmental Management Plan. Once these best practice mitigation measures are implemented the impacts to climate during the construction of the proposed development are considered ***direct, medium-term, imperceptibly negative*** and ***not significant***.

9.4.2 Operational Phase

Detailed mitigation measures are outlined within Section 9.6.2 of Chapter 9. The existing Knockharley Landfill facility has an existing IED Licence (W0146-04) issued by the EPA. The facility is required to comply with specific licence conditions, including monitoring and reporting on their emissions, to ensure that they do not pose a risk to human health or the environment. Once the mitigation measures are implemented,

the residual impacts on climate from the Operational Phase of the Proposed Development will be ***direct, long-term, negative*** and ***minor adverse.***

9.5 Cumulative Impact of the Proposed Development

In relation to climate, all global cumulative GHG sources are relevant to the effect on climate change. As a result, the effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed. This is due to the fact that there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other.

Chapter 10 – Noise and Vibration Non-Technical Summary

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10. NOISE AND VIBRATION

10.1 Introduction

The noise and vibration assessment addresses the potential noise and vibration effects associated with the proposed extension to the Knockharley Landfill, located in Knockharley, Navan, Co. Meath.

10.2 Baseline Environment

The existing Knockharley Landfill facility is located in Knockharley, Navan, Co. Meath. The surrounding environment land use is predominantly agricultural in nature on all boundaries. There are a number of residential properties located around all boundaries at varying distances from the landholding. The main noise sources within the existing facility which contribute to the prevailing noise environment relate to vehicles entering and exiting the site, mobile plant and equipment working at landfill areas, and a gas utilisation plant. Outside the facility, road traffic along the N2 and surrounding road network is the main contributor to the noise environment. The current noise environment is surveyed at six noise monitoring locations surrounding the site boundary on a quarterly basis to comply with the existing EPA IE Licence. The results of the most recent quarterly surveys undertaken during 2023, 2024 and 2025 have been reviewed and confirm that the noise contribution from the existing facility is below the daytime, evening and night-time noise limit values specified in the EPA IE licence (W0146-04) at all monitoring locations.

10.3 Potential Impacts of the Proposed Development

10.3.1 Construction Phase

The predicted construction noise levels are below the recommended noise thresholds which have been set to avoid significant effects at the closest noise sensitive locations. This is due to the nature of the proposed works associated with the construction phase and the distances between construction activities and the nearest noise sensitive locations. Vibration effects during the construction phase will be imperceptible at the nearest sensitive properties given the absence of any significant vibration generating activities during this phase and the distances between site works and the nearest sensitive buildings.

10.3.2 Operational Phase

Operational noise levels have been calculated for different phases of the Proposed Development and added to the planned future noise environment which includes a previously permitted landfill extension and ancillary additional areas of the site. The assessment has determined that during the initial operational phase (Phase 1), which requires tree felling and berm construction, the daytime operational noise limits have the potential to be exceeded at noise sensitive locations along the northern boundary. Felling will occur on a phased basis and the maximum noise levels predicted will be for a short duration (typically less than 1 week). Once this activity is completed, the operational noise levels during all phases of work are calculated to be below the day, evening and night-time limits at all noise sensitive locations.

10.4 Mitigation and Residual Effects (Post-Mitigation)

10.4.1 Construction Phase

During the construction phase, all plant items will be required to comply with the best practice standards from BS5228: 2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise and Part 2 Vibration, which offers detailed guidance on the control of noise and vibration from construction activities.

10.4.2 Operational Phase

The layout and design of the existing facility and the Proposed Development incorporates noise mitigation measures through the incorporation of screening berms around the site perimeters with noise sensitive properties, the location of fixed areas of site plant away from noise sensitive boundaries, and the hours of operation. There is potential for temporary exceedances of the daytime noise limit during activities associated with tree felling and berm construction along the north of the site at the closest NSLs along this boundary. Whilst these activities will only occur over limited periods of time in proximity to any NSL, a suite of mitigation measures are included to reduce noise impacts during these activities including the use of temporary mobile screens, phasing of works, prioritizing the development of berms along the northern boundary and noise

10.5 Cumulative Impact of the Proposed Development

10.5.1 Construction Phase

The cumulative construction phase noise impact of the Proposed Development combined with other planned or permitted projects in the vicinity is determined to be negative, slight to moderate and short term.

10.5.2 Operational Phase

The cumulative operational phase noise impact of the Proposed Development combined with other planned or permitted projects in the vicinity is determined to be negative, slight to moderate and long term.

Chapter 11 – Archaeology, Architectural and Cultural Heritage

Non-Technical Summary

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

11. ARCHAEOLOGY, ARCHITECTURAL AND CULTURAL HERITAGE

11.1 Introduction

The following chapter assesses the predicted impacts of the Proposed Development on archaeological, architectural and cultural heritage.

11.2 Baseline Environment

The baseline survey has identified that this area has been inhabited since early prehistory. Archaeological excavations in relation to previous phases of development on site since 2004 indicate a transient population of hunters concentrated in this area over a number of centuries in the Bronze Age. Artefactual evidence in the form of poetry also indicates human activity in the medieval and post-medieval periods.

No previously unrecorded features of archaeological or architectural heritage interest were noted in the desktop study or during the site walkover survey.

11.3 Potential Impacts of the Proposed Development

11.3.1 Construction Phase

The potential impacts of the Proposed Development on archaeological and architectural heritage can be summarised as follows:

- There are no recorded archaeological sites or monuments within the Proposed Development lands, as listed in the Record of Monuments and Places.
- There are 28 recorded archaeological sites within c. 1.5km of the Proposed Development lands. None of these sites will be impacted, either directly or indirectly, by the Proposed Development works.
- There have been eleven licenced archaeological excavations in the study area in advance of development works.
- A desk-top survey of the lands proposed for development, did not highlight any additional, previously unrecorded, archaeological features.
- The archaeological sites in the study area, coupled with the results of archaeological excavation, and with stray archaeological finds in the vicinity are indicative of the landscape having been populated since early prehistory and throughout the medieval and post-medieval periods.
- The majority of the Proposed Development lands have been developed since 2004, and subject to the archaeological monitoring (License No. 04E0778 (and extensions)). In the eighteen years of archaeological supervision, fifteen areas of archaeological potential were identified, of which fourteen were excavated. Twelve of the fourteen were determined to be archaeological. These excavations indicate a transient population of hunters concentrated in this area over a number of centuries in the Bronze Age. Artefactual evidence in the form of poetry also indicates human activity in the medieval and post-medieval periods.
- One of the archaeological features identified (Area 12, comprising a series of burnt spreads) was not excavated and remains in-situ beneath the re-deposited topsoil. Given the results of the excavation of other burnt features on site, coupled with the morphology and content of the findings in Area 12, it is likely that these features represent the remains of a fulacht fiadh or brunt mound (a Bronze Age cooking site). This will be directly impacted by the Proposed Development.
- There are areas of the Proposed Development lands that have not been archaeologically monitored and / or stripped of topsoil in the past, notably the northern and western portions of the proposed landfill extension. Should ground disturbance be required in these areas, there is the potential for previously unrecorded archaeological material to be uncovered during the course of construction works.

- There are no recorded architectural heritage sites within the Proposed Development lands, as listed in the National Inventory of Architectural Heritage and the Record of Protected Structures. There are four recorded NIAH sites within c. 1.5km of the Proposed Development lands, all listed in the RPS. None of these will be impacted, directly or indirectly, by the Proposed Development.

The potential impact of the Proposed Development on the archaeological, architectural and cultural heritage is deemed to be ***negative***, ***not significant*** and ***permanent***.

11.3.2 Operational Phase

No direct impacts on archaeological, architectural and cultural heritage are expected as a result of the operational phase of the Proposed Development.

11.4 Mitigation and Residual Effects (Post-Mitigation)

11.4.1 Construction Phase

In order to mitigate against the potential impacts of the Proposed Development on archaeological heritage, the following will be required:

- A suitably qualified archaeological consultant should be retained to oversee the archaeological and mitigation strategy for the Proposed Development prior to and during the construction phase.
- The location and extent of the identified but unexcavated archaeological features in Area 12 should be re-established, cordoned off and archaeologically excavated (preserved by record) under license to the National Monuments Service in advance of construction commencing in this area.
- Archaeological monitoring under license to the National Monuments Service should be undertaken in areas where topsoil stripping is required of lands that have not previously been stripped of topsoil by previous phases of development.
- In addition to Area 12, any potential archaeological features identified by monitoring that cannot be avoided (preserved in-situ), will require permission from National Monuments for the excavation (preservation by record) of these remains.
- Provision should be made for the post-excavation analysis and reporting of archaeological findings, in accordance with the licensing requirements of the National Monuments Service.

Should these mitigation measures be implemented, the residual impact of the Proposed Development on the archaeological, architectural and cultural heritage is deemed to be ***positive, long term*** and ***moderate***.

Please note that the recommendations given here are subject to the approval of the National Monuments Service, Department of Housing, Local Government and Heritage.

11.4.2 Operational Phase

No mitigation measures are required for archaeological, architectural and cultural heritage during the operational phase of the Proposed Development.

11.5 Cumulative Impact of the Proposed Development

11.5.1 Construction Phase

Archaeological investigations undertaken during previous development works at the site since 2004 have identified fifteen areas of archaeological potential, of which thirteen are archaeological in nature. The excavation of the one remining identified archaeological area, coupled with the excavation of any further archaeological features identified during monitoring of construction works, will add knowledge to the academic record.

The academic knowledge gained from the excavation of these features, has resulted in a net cumulative *permanent*, *significant*, *positive* impact.

11.5.2 Operational Phase

During operation there is no potential for cumulative impact as there will be no disturbance to ground.

Chapter 12 – Landscape and Visual Non-Technical Summary

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12. LANDSCAPE AND VISUAL

12.1 Introduction

This Landscape and Visual Assessment (LVIA) has been prepared to accompany a planning application for an extension to an existing land fill at Knockharley, County Meath. This LVIA describes the landscape context of the proposed development and assesses the likely landscape and visual impacts of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

12.2 Baseline Environment

The study area is characterised by broad, undulating terrain with low rolling hills rising from 60–70 m AOD to around 120 m AOD locally, with higher points such as the Hill of Slane and Hill of Tara reaching 160 m AOD in the wider landscape. The site is dominated by an existing landfill with partial capping, surrounded by conifer woodland, hedgerows, and predominantly pastoral fields. Watercourses include the Knockharley Stream to the north, the River Nanny to the south, and the River Boyne just over 4 km northeast. Kentstown, located just over 1 km south, is the main settlement, with Yellow Furze 3 km northwest, while the area otherwise comprises modest rural dwellings. Key transport routes include the N2 National Primary Route, R150, R153, local roads, and a nearby railway line. The local landscape is heavily influenced by anthropogenic features, with limited recreational use, whereas the wider area is rich in heritage, including the Boyne Valley, Slane Castle, Brú Na Bóinne, Hill of Tara, and Hill of Skryne.

In terms of landscape designations, the site is situated within LCA 6 - 'Central Lowlands'. LCA 6 - 'Central Lowlands', is identified as having; 'High' Landscape Value; 'Medium' Landscape Sensitivity, and; 'Regional' Landscape Importance. With regard to visual designation, several scenic views are contained within the study area, however many of these are not relevant to the proposed development as they are either outside of the visibility pattern or are oriented away from the proposed development. It should also be noted that some heritage features of national and international significance are also located within the wider landscape. As a result, it is considered important to assess the potential impact of the development on these locations due to their elevated nature and national/international significance.

12.2.1 Outline of Selected Viewpoints

The visual impact of a proposed development is assessed by Macro Works using up to 6 no. categories of receptor type as listed below:

- Key Views (from features of national or international importance) (KV);
- Designated Scenic Routes and Views (SR/SV);
- Local Community views (LCV);
- Centres of Population (CP);
- Major Routes (MR);
- Amenity and heritage features (AH).

The Viewshed Reference Points selected in this instance are set out in the table below.

VP No.	Location	Representative of	Direction of view
VP1	Newgrange Passage Tomb	AH, SV, KV	SW
VP2	N2 and Local road intersection at Rathdrinagh	MR, LCV	SW
VP3	Local road at Knockharley	LCV	S
VP4	Local road at Curraghtown	LCV	SE

VP No.	Location	Representative of	Direction of view
VP5	Local road at Seneschalstown	LCV	SE
VP6	L5056 at Flemingstown (1)	LCV	W
VP7	Local road at Brownstown (1)	LCV	E
VP8	L5056 at Flemingstown (2)	LCV	W
VP9	Local road at Brownstown (2)	LCV, SV	E
VP10	Local road at Veldonstown	LCV	NE
VP11	R150 at Kentstown	LCV, MR	N
VP12	Hill of Skryne	AH, SV	NE

12.3 Potential Impacts of the Proposed Development

12.3.1 Assessment of Receptor Sensitivity – Landscape

The immediate study area presents as a robust rural setting that has been heavily influenced by human intervention over time, with large scale anthropogenic land uses characterising notable parts of the study area. The landscape sensitivity at the site scale is deemed Low due to the heavily modified nature of the existing land fill site, rising to Medium-low outside of the site. It should also be noted that the study area also encompasses localised areas of higher sensitivity in the surrounds of some of the natural landscape features such as the River Nanny and River Boyne. Whilst a strong sense of cultural heritage is also evident, this relates to the wider surrounding landscape outside of the 5km study area.

12.3.2 Assessment of Receptor Sensitivity – Visual

The central study area is characterised by a typical settled pastoral landscape, with rolling farmland, hedgerows, and pockets of conifer forestry providing visual containment. Scenic designations are mostly at the periphery, often along elevated or open sections of local roads, and many are oriented away from the central area, including views toward the River Boyne Valley and Brú na Bóinne. Overall, visual sensitivity ranges from Medium to High, with heritage-linked views being the most sensitive. The pastoral landscape is generally pleasant, offering a green, working aesthetic, though anthropogenic features such as transport corridors, settlements, and industrial developments reduce the overall sense of naturalness. Sensitivity of visual receptors is influenced by their occupation and duration of view, with static residential receptors and those close to the site being most susceptible, while transient viewers on major routes are less sensitive. Localized areas heavily influenced by human development maintain a Medium-low sensitivity due to framing by surrounding pastoral land.

12.3.3 Magnitude of Landscape Effects - Construction Phase

During the construction phase, site activity will be notably more intensive than during operation, including HGV movements, heavy machinery, tower cranes, temporary materials storage, site lighting, and security hoarding. While some large areas of woodland will be removed to accommodate earthen berms (up to 14 m high) and a new landfill pit, existing boundary hedgerows and trees will be retained, protected, and strengthened where necessary. Additional works include realignment of the Knockharley Stream and excavation for the 220 kV overhead cable corridor. The internal parts of the site are largely contained by surrounding vegetation, limiting perceptible landscape changes beyond the site boundary. The most noticeable effects will occur in later construction stages as berms and pylons emerge above the vegetation. Construction effects are considered High-Medium within the site and its immediate vicinity (<200 m), diminishing to Low or Negligible at greater distances. Given the low sensitivity of the immediate landscape,

the overall significance of construction-phase effects is assessed as ***moderate-slight*** and ***negative***, with impacts being ***short-term*** in nature. These effects are deemed Not Significant.

12.3.4 Magnitude of Visual Effects – Construction Phase

During construction, the main visual impacts will stem from frequent HGV and worker vehicle movements, on-site machinery, stockpiles, and occasional tower cranes extending above vegetation. Much of the activity will be screened by mature trees and established boundary vegetation, with the most noticeable effects limited to the western site where conifer woodland will be removed to accommodate the landfill and screening berms. Glimpse views of construction may occur here until the berms are established. Realignment of overhead cables and pylon installation may also be visible above intervening vegetation in the western part of the site. Overall, visual effects are assessed as Medium only in localized areas near the site, while most surrounding receptors experience Negligible effects due to screening and distance. Given the existing landfill activity, medium-low receptor sensitivity, and ***short-term*** duration, construction-phase visual impacts are considered no greater than ***moderate*** and are deemed ***negative*** in quality. These effects are deemed Not Significant.

12.3.5 Magnitude of Landscape Effects - Operational Phase

The operational phase of the proposed development will extend the existing landfill westward within its current boundaries, resulting in the loss of some perimeter conifer woodland but no expansion of the overall site area. While land cover will change and landfill activities will intensify and be prolonged, much of the extended void will be screened by existing vegetation and new earthen berms. The replacement of low-quality conifer with native broadleaf woodland will result in localised positive effects, enhancing biodiversity and ecological corridors over time. Overall, the operational phase represents an intensification of a well-established land use, with limited impact on the surrounding landscape character. The medium-low landscape sensitivity and medium magnitude of effect within 500 m will result in a significance of effect no greater than ***moderate***, while effects beyond the immediate vicinity of the site will reduce rapidly to Slight and Imperceptible. Operational-phase landscape effects are Permanent in terms of duration and will result in a ***negative-neutral*** in quality of effect. These effects are deemed Not Significant.

12.3.6 Magnitude of Visual Effects - Operational Phase

VP No.	Visual Receptor Sensitivity	Magnitude of Visual Impact	Significance/ Quality/Duration of Impact
VP1	Very High	Negligible	Imperceptible / Neutral / Permanent
VP2	Medium-low	Negligible	Imperceptible / Neutral / Long-term
VP3	Medium-low	Medium-low	Moderate-slight / Negative / Permanent
VP4	Medium-low	Low	Slight / Negative / Permanent
VP5	Medium-low	Low-negligible	Slight-imperceptible / Negative / Permanent
VP6	Medium-low	Negligible	Imperceptible / Neutral / Permanent
VP7	Medium-low	Low-negligible	Slight-imperceptible / Negative / Permanent
VP8	Medium-low	Low-negligible	Slight-imperceptible / Negative / Permanent

VP No.	Visual Receptor Sensitivity	Magnitude of Visual Impact	Significance/ Quality/Duration of Impact
VP9	Medium	Negligible	Imperceptible / Neutral / Permanent
VP10	Medium-low	Negligible	Imperceptible / Neutral / Permanent
VP11	Medium-low	Low-negligible	Slight-imperceptible / Negative / Permanent
VP12	High	Negligible	Slight-imperceptible / Negative / Permanent

12.3.7 Magnitude of Landscape Effects – Reinstatement Phase

When the landfill operations end, the site will be progressively capped and restored. Most of the reinstatement work will focus on improving biodiversity. New hedgerows will be planted, existing woodlands will be managed and maintained, and the capped landfill surface will be seeded as a native meadow. These measures will help return the area to a green, natural landscape similar to how it appeared before excavation. Over time, the site's industrial appearance will be further screened as vegetation becomes established, creating a more natural and characteristic rural environment. Some small access tracks will remain, but overall, the site will blend into the surrounding landscape. The restoration will provide long-term benefits for local wildlife and improve the visual quality of the area. Overall the reinstatement phase landscape effects are deemed *moderate-slight* at the site scale, *positive* in terms of quality and *permanent* in terms of duration. Thus, the reinstatement phase landscape effects are deemed Not significant.

12.3.8 Magnitude of Visual Effects – Reinstatement Phase

VP No.	Visual Receptor Sensitivity	Magnitude of Visual Impact	Significance/ Quality/Duration of Impact
VP1	Very High	Negligible	Imperceptible / Neutral / Permanent
VP2	Medium-low	Negligible	Imperceptible / Neutral / Permanent
VP3	Medium-low	Negligible	Imperceptible / Neutral / Permanent
VP4	Medium-low	Negligible	Imperceptible / Neutral / Permanent
VP5	Medium-low	Negligible	Imperceptible / Neutral / Permanent
VP6	Medium-low	Low	Slight / Positive / Permanent
VP7	Medium-low	Negligible	Imperceptible / Neutral / Permanent
VP8	Medium-low	Low-negligible	Slight-imperceptible / Positive / Permanent
VP9	Medium	Negligible	Imperceptible / Neutral / Permanent

VP No.	Visual Receptor Sensitivity	Magnitude of Visual Impact	Significance/ Quality/Duration of Impact
VP10	Medium-low	Negligible	Imperceptible / Neutral / Permanent
VP11	Medium-low	Low-negligible	Slight-imperceptible / Positive / Permanent
VP12	High	Low-negligible	Slight-imperceptible / Positive / Permanent

12.4 Mitigation and Residual Effects (Post-Mitigation)

12.4.1 Construction Phase

With regard to landscape and visual there are limited construction-stage mitigation measures as the site is well established and heavily screened from surrounding receptors. In this regard, there is no requirement for site hoarding or additional screening to screen the construction stage effects as much of the construction stage works will be heavily screened by the existing surrounding vegetation.

The principal construction stage landscape and visual impacts are associated with the movement of heavy earth-moving machinery and the erection of tower cranes on-site. In addition, the temporary storage of excavated materials on-site and the gradual emergence of the proposed development will also generate landscape and visual impacts. Nevertheless, due to the heavily contained nature of the site, it is considered that both construction landscape and visual effects will be heavily diminished. However, at the site scale, there will be some notable degree of change in regards to removal of areas of woodland, construction of the new landfill and construction and removal of the realigned overhead cables corridors.

Overall, the construction stage landscape effect is deemed to be no greater than a Moderate-slight significance and Negative in quality, whilst the significance of construction stage visual impacts is deemed to be no greater than Moderate and of a Negative quality in the immediate surrounds of the site. Nonetheless, these impacts will reduce rapidly the immediate site context, which is well contained by both perimeter vegetation and layers of intervening vegetation within the immediate surrounding landscape. The construction stage landscape and visual effects are classified as 'short-term' in terms of duration. Overall, the residual construction stage effects are deemed ***not significant.***

12.4.2 Operational Phase

The proposed development has been carefully located within the boundaries of the existing landfill facility, which is already well screened by mature vegetation. This means the project will not introduce a new land use to the area, and its visual presence will remain contained within the established site.

Existing trees, hedgerows, and vegetation around the perimeter will help screen the development from view. While, 12.9 ha of planted woodland will be removed, native hedgerows will be retained, protected, and strengthened where necessary through additional planting. These improvements will ensure the boundary vegetation remains dense and consistent, helping to blend the development into the surrounding landscape. Additional screening will be provided by new earthen berms built using on-site material. 8.86 ha of native woodland will be established at the base of earthern berm and the peoposed landfill as well as in other areas around the site. This enhance biodiversity and visual integration, while the upper slopes of the berms and landfill (following final capping) will be managed as native grassland to maintain a natural skyline. Overall, the combination of careful siting, use of existing vegetation, and new landscape planting will ensure the development has a limited visual impact and remains in keeping with the surrounding landscape character.

The proposed landfill extension is located within an existing, well-established landfill facility and is enclosed by mature vegetation. This ensures the development remains visually contained and consistent with the existing land use rather than introducing a new or unfamiliar feature. Additional landscape measures, including earthen berms and native woodland planting, will further enhance screening and integration with the surrounding landscape. The site lies within a modified rural area already influenced by existing infrastructure and development, and has capacity to accommodate further change. As such, the operational landscape effects are assessed as Moderate and are deemed *not significant*, with the development representing a continuation and intensification of existing land uses rather than a new visual intrusion.

Visual assessments from representative viewpoints indicate that the proposed landfill itself will not be visible due to existing screening. Limited visibility will occur only in relation to the realignment of overhead cables and new pylons near the site, which will appear as a continuation and slight intensification of existing features rather than new elements in the landscape. Views from key heritage and scenic locations, including Brú na Bóinne and the Hill of Tara area, will experience Imperceptible effects. Following closure and reinstatement, the site will transition to a native grassland meadow with enhanced hedgerows and planting, resulting in a positive long-term effect that blends with the surrounding rural character. Overall, residual landscape and visual effects during both the operational and reinstatement phases are assessed as *not significant*.

12.5 Cumulative Impact of the Proposed Development

12.5.1 Construction Phase

During the construction phase, the proposed landfill extension is expected to result in limited cumulative landscape and visual effects when considered alongside existing, permitted or proposed developments within the study area or wider surrounding landscape. The site is contained within an established landfill facility, and construction activities will be largely screened by existing perimeter vegetation, hedgerows, and surrounding landform. While some temporary visual changes may occur due to construction plant, materials, earthworks and removal of some areas of forestry, these effects are localised and largely confined to the site itself. In combination with existing infrastructure, including the operational landfill and overhead cables, the construction phase represents an intensification of current land use rather than the introduction of a new feature. With the implementation of standard construction-phase mitigation measures, such as temporary screening and management of visual intrusion, cumulative construction phase effects will be limited and are assessed as **Not significant**.

12.5.2 Operational Phase

During the operational phase, cumulative effects of the proposed landfill extension are expected to be limited. The development is fully contained within the existing landfill site and is well screened by mature perimeter vegetation, hedgerows, and proposed mitigation measures such as earthen berms and additional native planting. Indeed, this is reinforced by the operational phase visual effects outlined above, which range between Moderate-slight and Imperceptible, with a large majority of visual receptors classified with an Imperceptible visual effect. In combination with existing infrastructure and land uses, including the operational landfill and overhead cables, the extension represents a continuation and intensification of existing features rather than a new visual intrusion. As a result, the operational phase cumulative landscape and visual effects are assessed as **Not significant**.

Chapter 13 – Material Assets – Traffic and Transportation
Non-Technical Summary

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13. TRAFFIC AND TRANSPORTATION

13.1 Introduction

The assessment of Traffic and Transport is contained within Chapter 13 of Volume II of the EIAR. Chapter 13 of the Environmental Impact Assessment Report (EIAR) examines the likely significant effects of the Proposed Development on the receiving road environment assessing how the proposed development may affect traffic and transport in the surrounding area. It assesses current road conditions, predicts future traffic levels with and without the project, and evaluates potential impacts during both construction and operational phases.

Chapter 13 has been prepared in accordance with the provisions of the EIAR Guidelines for Planning Authorities and An Bord Pleanála (August 2022), ensuring compliance with relevant national legislation and best practice in environmental assessment. In addition, the assessment has been carried out with due regard to the Transport Infrastructure Ireland (TII) *'Traffic and Transport Assessment Guidelines'* (May 2014), which provide a structured framework for evaluating the potential effects of traffic arising from proposed developments. As such, Chapter 13 constitutes a comprehensive Traffic and Transport Assessment (TTA) and addresses both the construction and operational aspects of traffic generation, movement, and mitigation in the context of the proposed development.

Knockharley Landfill has operated since 2004 under an EPA licence and currently has permission to accept up to 440,000 tonnes of waste per year, including non-hazardous wastes such as household, commercial, industrial and construction wastes, as well as a limited amount of stable non-reactive hazardous waste.

The current proposal is to expand the landfill void space so that the site can continue to operate until this capacity is filled. Importantly, there is no change to the permitted annual intake of waste. Since the yearly tonnage remains capped at existing levels, the number of vehicle trips to and from the site will remain broadly the same as at present. In practice, this means that day-to-day traffic associated with the landfill will continue at established levels.

13.2 Baseline Environment

The site is located in the townland of Knockharley, approximately 6km south of Slane on the west side of the N2 National Primary Route. Navan is located approximately 13km to the west of the site via Balrath Cross and the R153 Regional Road. The site is served by a purpose-built access road that connects directly to N2 which is the primary haul route for all directions of travel.

The study area comprises N2 between Kilmoon in the south and Slane to the north and includes the junction of the N2 with the N51 in Slane, L1613 Rathdrinagh Crossroad, Knockharley Landfill Access Junction, R150 O'Brien's Cross, R153 Balrath Cross, R152 Kilmoon Cross and also R150/R153 in Kentstown village.

Traffic surveys were undertaken in April 2025 and included manual classified counts and these are typically employed to understand the general characteristics of the surrounding road network. Such surveys are essential in providing a baseline understanding of network operation, particularly at key junctions or access points, and to inform capacity assessments and safety reviews.

However, traffic surveys are not expressly intended to determine traffic generation from the existing development. In the case of an existing landfill operation, the most accurate and representative data source for site-related traffic is derived from weighbridge records. These records offer a comprehensive, long-term, and verifiable dataset.

The baseline scenario assumes the cessation of landfill operations so the baseline is established by removing the traffic generated by the landfill from the those turning traffic flows recorded in the surveys.

13.3 Potential Impacts of the Proposed Development

13.3.1 Operational Phase

Trip estimation at the proposed development is based upon direct comparison to the existing development and is based upon basic operating criteria in terms of the number of workers, customers, visitors and services provided. The trip forecasting methodology involves comparing the proposed development with a existing development and applying trip information to the proposed development. The proposed development is forecast to continue to employ 25 no. staff. The HGV trips arising from landfilling operations is derived from examination of weighbridge data spanning three years. The weighbridge data has also been used to determine the distribution of landfill traffic and assignment of that traffic to the receiving road network based upon the origins of materials received.

Daily fluctuations in traffic occur in practically every traffic environment and this is true of commercially driven enterprise. The traffic assessments in Chapter 13 consider a range of traffic generation scenarios and values with the higher assessment value being the 85th percentile of the data sample and the lower value being reflected by the average. In addition a 'worst case' value is used and might be considered a sensitivity test or stress test. Average traffic generation values are important to consider against the Annual Average Daily Traffic since this is an industry metric in the evaluation of roads capacity and roads maintenance. The average HGV traffic generation arising from ordinary landfill operations is 73 no. HGV loads per day, the 85th percentile value is 92 no. HGV loads per day and the 'worst case' assessment value is 144 no. HGHV loads per day.

By basing traffic generation estimates on site records and weighbridge data, the assessment reflects real-world operating conditions and incorporates variability linked to market demand, project cycles, and material availability. This ensures that the EIAR traffic impact assessment is grounded in evidence-based data, capturing both the intensity and temporal distribution of site related traffic.

Based upon standard peak hour assessments it can reasonably be concluded that the impact of the proposed development on the capacity and operation of the receiving road network is not likely to be significant. None of the threshold criteria set out in the Transport Infrastructure Ireland (TII) *'Traffic and Transport Assessment Guidelines'* (May 2014) are exceeded. The scope of assessments focuses on the operation of the N2, N51, R150 and R152. Turning traffic flows at the junction of these roads with the N2 are forecast not to exceed either the 10% threshold value, or the lower 5% threshold values set out in the TII *'Traffic and Transport Assessment Guidelines'* when evaluated based upon the average traffic generation rates, the upper value rates or the 'worst case' rates for the proposed development (which not only includes worst case operational traffic but also includes construction traffic).

The likely traffic impact arising from the proposed development does not exceed the markers that typically trigger the need for detailed capacity assessment and the forecast impact would ordinarily not warrant further junction capacity assessment with respect to the potential impact upon the capacity and operation of the junctions in the study area. The numerical resolution of junction modelling programs is not sensitive to traffic changes of the magnitude arising from the proposed development operation. A sub 1.0-3.7% change in turning volumes will not alter the model outputs in a way that is statistically or operationally meaningful. This is because the natural variability in traffic counts, daily and seasonal fluctuations often significantly exceeds a 3.7% variation. It is not best practice to model minor flow changes that are indistinguishable from background variability.

Junctions typically operate within performance thresholds where a 1.0-3.7% change would not affect, operational level of service (LoS) and would not trigger points for mitigation or trigger the need for intervention or upgrade. Transport Infrastructure Ireland (TII) and other agencies (e.g., CIHT) advocate for proportionate analysis and recommend that detailed junction modelling should be reserved for material changes (typically ≥5–10%) in flow.

The following Table 13-1 summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 13-1. Summary of Operational Phase Traffic Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Traffic	Negative	Not Significant	Receiving Network	Likely	Long-term	Direct

13.3.2 Construction Phase

Some temporary increases in traffic will occur during construction works to develop new landfill cells. These activities are cyclical, short-term in nature, and similar to works that have taken place regularly since the site first opened. Construction activities will be carried out in tandem with the operation of the landfill and so construction traffic effects have been assessed to include for the combination of Upper Value operational traffic combined with the peak construction phase traffic generation during which time materials will be imported for construction and soil will be exported. The assessment criteria are representative of the most intensive construction traffic generating period, and the analyses combines construction traffic with the Upper Value operational traffic generation of the landfill and so the assessments can reasonably be considered robust. Importantly the results of the assessments show that the short-term forecast increase in traffic during the construction phase when combined with Upper Value operational traffic will be less than the lower threshold value of 10% on the receiving road network in the study area. As per the operational phase, the threshold value of 10% is not exceeded. Based upon robust assumptions, the greatest impact is forecast at +2.8% so for the same reasons set out for the assessment of operational phase traffic effects, the traffic arising during the construction periods of the current proposed development will not give rise to capacity issues at the existing development access or on the adjoining receiving road network.

Table 13-2 summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 13-2. Summary of Construction Phase Traffic Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
General Construction Traffic	Negative	Not Significant	Receiving Network	Likely	Long-term	Direct

13.4 Mitigation and Residual Effects (Post-Mitigation)

13.4.1 Operational Phase

The following mitigation measures are proposed:

HGV deliveries to the landfill will be spread evenly throughout the day, avoiding unnecessary clustering and reducing potential for congestion. Site access and internal circulation is designed to accommodate HGVs safely and efficiently. The landfill will continue to operate a delivery management system to monitor and manage HGV scheduling.

Regular road maintenance and inspection of the site entrance will continue to be conducted to ensure safety and cleanliness of the immediate road interface.

When commencing the operational phase of the proposed development drivers that will be using the site will be required to attend a HGV driver induction lecture which the Applicant has initiated at this and other similar sites and considers a useful tool for ensuring that all new drivers are fully aware of the rules and expectations regarding safety, adherence to the haul route, speed limits, and courteous behaviour towards other road users.

The following Table 13-3 summarises the identified likely significant effects during the operational phase of the proposed development after mitigation measures are applied.

Table 13-3. Summary of Operational Phase Traffic Effects after Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Traffic	Negative	Not Significant	Receiving Network	Likely	Long-term	Direct

13.4.2 Construction Phase

Construction phase effects will be short-term. It is expected that construction traffic will follow the same haul route as operational traffic which includes the N2 and R153. The effects of construction traffic upon the capacity of the access are forecast not to be significant.

The following mitigation measures are proposed:

- A *Construction Traffic Management Plan* will be prepared
- A detailed *'Construction Environmental Management Plan* (CEMP) also accompanies the planning application.

The *Construction Traffic Management Plan* (CTMP) will be prepared and agreed with the local authority in advance of works commencing via compliance with a relevant condition in the event of a grant of permission. Construction HGV routes will be defined to avoid local residential areas and sensitive receptors, with access limited to designated haul routes which exclude the use of the R150 between Kentstown Village and O'Brien's Cross on the N2.

Construction deliveries will be scheduled to avoid local network peak hours where possible. Wheel-wash facilities will be used where necessary to prevent deposition of mud or debris on public roads. All construction vehicles will be required to comply with safety standards, including visible identification, reversing alarms, and, where relevant, banksmen assistance for manoeuvres.

The following Table 13-4 summarises the identified likely effects during the construction phase of the proposed development after mitigation measures are applied.

Table 13-4. Summary of Construction Phase Traffic Effects after Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
General Construction Traffic	Negative	Not Significant	Receiving Network	Likely	Long-term	Direct

13.5 Cumulative Impact of the Proposed Development

13.5.1 Operational Phase

The cumulative impact assessment considers the extent to which traffic generated by other permitted developments within a 5km radius may contribute to additional volumes on the receiving local road network. In respect of other developments, it is considered unlikely that the volumes of traffic generated would be significant. The principal traffic growth on the receiving road network arising from these developments, excluding the Slane Bypass, along with wider background growth, is considered to be robustly addressed through the application of Transport Infrastructure Ireland (TII) national traffic growth rate factors. Applying these growth rates to baseline traffic flows on the network, captures the expected additional traffic demand from both committed development and broader background trends, without the need to separately model every individual development within the study area. This ensures that cumulative effects are inherently accounted for in a consistent and non-duplicative manner. Having reviewed the planning files for all of the permitted developments listed within the study area, excepting Slane Bypass, it is considered reasonable and appropriate to rely on the application of TII national traffic growth factors to the receiving regional road network in this case. This approach ensures that the cumulative traffic effects of permitted developments in the wider area are appropriately reflected in the traffic assessment, while avoiding duplication or overestimation of impacts.

The EIAR for Slane Bypass concludes that operationally, the bypass will optimise traffic flows, reduce bottlenecks through Slane, and encourage HGV retention on the national primary route rather than diversion to sub-standard regional roads. The embedded operational mitigation measures, combined with the inherent improvements to corridor efficiency, result in an overall positive traffic impact, with no further mitigation required.

The cumulative traffic arising from future economic growth and development resulting in traffic growth on the receiving network are included for in both the 'do-nothing' and 'do-something' road network assessment scenarios. It is reasonable to expect that traffic arising from the proposed development would by definition be included, or at least included in part in the TII growth rates. This factor is disregarded in the traffic assessments which considers all future traffic to the proposed development as totally new to the road network for both the proposed construction and operational periods.

13.5.2 Summary

Table 13-5 summarises the identified likely cumulative effects during the operational phase of the proposed development.

Table 13-5. Summary of Operational Phase Traffic Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Traffic	Negative	Not Significant	Receiving Network	Likely	Long-term	Direct

13.5.3 Construction Phase

Construction activities are cyclical in nature, and similar to works that have taken place regularly since the site first opened. Construction activities will be carried out in tandem with the operation of the landfill and so construction traffic effects have been assessed to include for the combination of Upper Value operational traffic combined with the peak construction phase traffic generation during which time

materials will be imported for construction and soil will be exported. The cumulative assessment inherently includes both the operational and construction traffic arising.

13.5.4 Summary

The following Table 13-6 summarises the identified likely significant effects during the construction operational phase of the proposed development before mitigation measures are applied.

Table 13-6. Summary of Construction Phase Traffic Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
General Construction Traffic	Negative	Not Significant	Receiving Network	Likely	Long-term	Direct

Chapter 14 – Material Assets – Utilities and Waste Non Technical Summary

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14. MATERIAL ASSETS – UTILITIES AND WASTE

14.1 Introduction

This chapter assesses the potential impacts of the Proposed Development on material assets, including built services / utilities and waste, in line with the EIA Directive (2011/92/EU as amended by 2014/52/EU) and EPA Guidelines (2022). The EPA Guidelines (EPA, 2022) specifically lists and provides sample headings and topics for material assets that include: Roads and Traffic, (Construction Phase, Operational Phase, Unplanned Events [i.e. Accidents]), Built Services (Electricity, Telecommunications, Gas, Water Supply Infrastructure, and Sewerage), Waste Management (Construction Waste, and Operational Waste). A site-specific Resource & Waste Management Plan (RWMP) has been prepared by WSP Ireland Consulting Ltd in accordance with EPA Best Practice Guidelines (2021) to manage resource use and waste generation during excavation and construction. The purpose of this chapter is to identify and evaluate any potential significant impacts that the Proposed Development may have on these material assets, such as damage to infrastructure or disruptions to essential services, and to ensure the sustainable management of wastes arising at the development site in accordance with the legislative requirements and best practice standards. By conducting this assessment, appropriate mitigation measures can be developed and implemented to minimise any negative impacts and ensure that the development project is conducted in an environmentally responsible manner.

14.2 Baseline Environment

The existing Knockharley Landfill facility occupies a site of approximately 135.2 ha and operates under EPA Industrial Emissions Licence W0146-04. It is currently being developed under An Coimisiún Pleanála permission Reg. Ref. 303211, which permits an expanded landfill capacity of approximately 440,000 t per year. The site, located in the townlands of Knockharley, Flemingstown, and Tuitrath, Navan, Co. Meath, is primarily in active landfill use. It lies around 800 m from the N2 National Primary Road, with access via a private entrance. The surrounding area is predominantly agricultural with scattered residential properties, the closest being along Knockharley Road to the north and Rathdrinagh/Flemingstown Road (L5056) to the east. The Knockharley Stream flows through and along the northern and eastern site boundaries before joining the Nanny River approximately 3 km downstream, while the Kentstown Stream runs along the southern boundary for about 90 m before joining the Knockharley Stream.

14.3 Potential Impacts of the Proposed Development

14.3.1 Construction Phase

14.3.1.1 Utilities

- Land Use, Property, and Access: A Construction Environmental Management Plan (CEMP) will be implemented and updated as required throughout the construction phase to manage activities on site, minimise nuisance to neighbouring properties, and ensure compliance with all mitigation measures and planning conditions. The potential impact in the absence of mitigation measures would be ***negative, not significant,*** and ***long-term.***
- Power Supply and Electrical Supply: Any works near existing electrical infrastructure will be carried out in consultation with ESB Networks and in line with utility provider requirements to ensure the safety of works and avoid any service interruptions. The potential impact in the absence of mitigation measures would be ***neutral, imperceptible,*** and ***long-term.***
- Telecommunications: No works are anticipated that would interfere with existing telecommunications infrastructure during the construction phase. The potential impact in the absence of mitigation measures would be ***neutral, imperceptible,*** and ***long-term.***
- Surface Water Infrastructure: During the construction phase, rainfall run-off and dewatering water may contain increased silt levels or become polluted from construction activities. Suspended solids

can increase sediment loads and turbidity, potentially affecting local infiltration capacity or downstream watercourses. This may lead to increased surface water run-off and sediment loading, which could overwhelm existing on-site drainage systems, cause localised flooding, and damage on-site surface water networks. As there is no connection to the public surface water network there is ***no potential impact*** on the public surface water network.

- Foul Drainage Infrastructure: As there is no connection to the public foul water network, ***no impacts*** on the public foul drainage infrastructure are anticipated during the construction phase.
- Potable Water Supply: The water demand during the construction phase will not be significant enough to affect existing pressures. The potential impact on potable water supplies and infrastructure during the construction phase is ***negative, imperceptible,*** and ***long- term.***
- Natural Gas: There is no requirement for natural gas connection, therefore during the construction phase there is ***no potential impact***.

14.3.1.2 Waste

- If waste materials are not managed and stored correctly, it is likely to lead to litter or pollution issues at the Proposed Development site and in adjacent areas, with the indirect effect of vermin and flies in affected areas. In the absence of mitigation, the effect on the local and regional environment is likely to be ***long-term, not significant,*** and ***negative.***
- The use of non-permitted waste contractors or unauthorised waste facilities could result in inappropriate management of waste and indirect negative environmental impacts, including pollution. It is essential that all waste materials are managed in accordance with regional and national legislation, with adequate time and resources allocated to ensure efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be ***long-term, not significant,*** and ***negative.***
- C&D wastes arising will need to be taken to suitably registered, permitted, or licensed waste facilities for processing and segregation, reuse, recycling, recovery, and/or disposal, as appropriate. There are numerous licensed facilities in the EMR and across Ireland capable of accepting both hazardous and non-hazardous waste, with sufficient capacity to accommodate the likely volumes from the Proposed Development. Many construction materials are recyclable or recoverable. Without mitigation, the effect on the local and regional environment is likely to be ***long-term, significant,*** and ***negative.***
- A quantity of material will need to be excavated to facilitate the Proposed Development. Correct classification and segregation of excavated material is required to ensure any potentially contaminated materials are identified and managed to avoid negative impacts on workers and on soil and water environments, both on and off-site. Without mitigation, the effect on the local and regional environment is likely to be ***long-term, significant,*** and ***negative.***

14.3.2 Operational Phase

14.3.2.1 Utilities

- Land Use, Property, and Access: The Proposed Development is not expected to generate significant air or odour emissions, noise, water emissions, or traffic impacts under normal operating conditions. The development is consistent with the zoning of the lands. The overall potential impact is therefore predicted to be ***localised, neutral, not significant,*** and ***long-term.***
- Power Supply and Electrical Supply: The Proposed Development will continue to be served by the existing electricity connection, with no significant additional demand anticipated beyond current operational requirements for administration and site facilities. Maintenance of the existing electrical infrastructure will follow the utility supplier's requirements. Based on this, the impact predicted to be ***neutral, imperceptible,*** and ***long-term.***
- Telecommunications: There will be no significant increase in demand on the local telecommunications network during the operational phase, and no additional capacity will be required

from the wider network. Connections to the external telecommunications network will be completed by a statutory operator. As such, the potential impact is ***neutral, imperceptible,*** and ***long-term.***

- Surface Water Infrastructure: During operation, a primary risk to surface water quality arises from contaminated runoff, where rainwater comes into contact with waste materials, leachate, or other pollutants on site. As there is no connection to public surface water infrastructure there is ***no potential impact.***
- Potable Water Supply: The Proposed Development will continue to use the existing mains connection for potable water, with no increase in operational demand. Consequently, the potential impact is considered ***neutral, imperceptible,*** and ***long term.***
- Natural Gas: There is no requirement for natural gas connection, therefore during the operational phase there is ***no potential impact.***

14.3.2.2 Waste

- Improper or inadequate waste management during the operational phase could result in small volumes of waste being sent unnecessarily to landfill rather than being reused or recycled, diverging from the priorities of the waste hierarchy. In the absence of mitigation, the effect on the local and regional environment is likely to be ***long-term, significant,*** and ***negative.***
- The nature of the Proposed 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 effectively from this type of development. Waste unsuitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables, which is typically exported as a raw material to produce 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. In the absence of mitigation, the effect on the local and regional environment is likely to be ***long-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, 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.***

14.4 Mitigation and Residual Effects (Post-Mitigation)

14.4.1 Construction Phase

14.4.1.1 Utilities

Consultation with Meath County Council, EirGrid, ESB Networks, and other relevant service providers, along with compliance with their requirements, will help ensure a smooth construction schedule without disruption to the local community and businesses. The contractor will implement best practice measures for any planned interruptions and employ strict quality control during the installation of pipes and utilities to minimise infiltration and ex-filtration. Prior to construction, a comprehensive utility locating survey using technologies such as ground-penetrating radar and electromagnetic induction will identify the location and depth of all underground services, with exclusion zones established around identified utilities to guide safe construction. A detailed Construction Environmental Management Plan (CEMP) will be prepared before works commence, outlining construction techniques, mitigation measures, and relevant planning conditions. The CEMP will be implemented by the contractor, overseen and updated as necessary by the

Project Manager, Environmental Manager, Resource Manager, and Ecological Clerk of Works, and all personnel will be trained in its procedures to ensure safe and organised site management.

The implementation of mitigation measures will ensure that the residual impacts on the material assets considered in this chapter during the construction phase will be ***neutral, not significant,*** and ***long-term***.

14.4.1.2 Waste

During the construction phase, a project-specific Resource & Waste Management Plan (RWMP) has been prepared in line with EPA Best Practice Guidelines and will be implemented throughout the excavation and construction works. Excavated materials will be appropriately classified, segregated, and managed to avoid negative impacts on workers and the surrounding soil and water environments. On-site waste will be segregated to maximise reuse, recycling, and recovery, and any waste leaving the site will be transported by permitted contractors to licensed facilities. These measures will ensure compliance with relevant waste legislation, promote sustainable resource use, and minimise environmental impacts from construction waste.

When the mitigation measures are implemented and a high rate of prevention reuse, recycling and recovery is achieved, the predicted impact of the construction phase on the environment will be ***long-term, imperceptible*** *and* ***neutral*****.**

14.4.2 Operational Phase

14.4.2.1 Utilities

The Proposed Development stormwater drainage network design includes sustainable drainage systems (SuDS), i.e. surface water swales, wetlands and attenuation ponds, these measures by design will ensure the stormwater leaving the site is of a suitable quality. Any necessary maintenance or upgrades of on-site utilities infrastructure during the operational phase of the Proposed Development will be carried out in accordance with the specifications of the relevant service providers and facilitated by facilities management.

The implementation of mitigation measures will ensure that the residual impacts on the material assets considered in this chapter during the operational phase will be ***neutral, imperceptible,*** and ***long-term***.

14.4.2.2 Waste

During facility operations, waste materials will be segregated on-site into appropriate categories and stored in clearly identified bins or suitable receptacles in designated, accessible areas. Wastes from plant servicing and maintenance will be immediately removed by the service contractor, and sludges from the on-site interceptor will be removed regularly by a licensed operator. All waste leaving the site will be transported by permitted contractors to licensed facilities. These measures ensure compliance with relevant waste legislation and promote optimum levels of waste reduction, reuse, recycling, and recovery.

When 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*****.**

14.5 Cumulative Impact of the Proposed Development

14.5.1 Construction Phase

14.5.1.1 Utilities

The Proposed Development involves minimal use of public utilities during construction, so there is limited potential for cumulative impacts in combination with other planned or permitted developments. Developments reviewed in Chapter 2; Appendix 2.1 have the potential to combine with the Proposed Development to affect material assets. Coordination with relevant service providers and compliance with statutory requirements for electrical and water infrastructure will be maintained. With mitigation measures in place and adherence to agreements with network providers, the Proposed Development is unlikely to cause prolonged utility disruption, additional demand, or medium-term impacts on significant infrastructure, and significant cumulative effects with other developments are not expected. The residual cumulative effects on the material assets during the construction phase for the Proposed Development will be ***negative, not significant,*** and ***short-term***.

14.5.1.2 Waste

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 cumulative effect in terms of waste will be ***short-term, imperceptible*** *and* ***neutral.***

14.5.2 Operational Phase

14.5.2.1 Utilities

The Proposed Development and all permitted developments must engage with MCC, Uisce Éireann, and ESB to ensure sufficient capacity for water and electricity. Developments reviewed in Chapter 2; Appendix 2.1 could potentially combine with the Proposed Development to affect material assets. However, no additional utility connections are required at the existing Knockharley Landfill facility, so there is ***no potential for cumulative impact*** during the operational phase.

14.5.2.2 Waste

Existing residential and commercial developments nearby generate similar waste types, and authorised contractors will collect waste segregated into recyclables, organic waste, and non-recyclables. The Proposed Development may also produce additional streams, such as leachate and sludges. Other developments are required to manage waste in compliance with national and local legislation, policies, and plans, which will minimise potential cumulative impacts. As a result, the effect is expected to be ***long-term, imperceptible,*** and ***neutral.***