ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Volume II Main Body & Appendices

STARRUS ECO HOLDINGS LTD

Ballymount Road Upper
Dublin 24

O'Callaghan Moran & Associates
ENVIRONMENTAL MANAGEMENT FOR BUSINESS

December 2023

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

MATERIALS RECOVERY FACILITY

BALLYMOUNT ROAD

DUBLIN

Prepared For: -

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Prepared By: -

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November 2023

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GLOSSARY OF ACRONYMS

AA: Appropriate Assessment

ACA: Architectural Conservation Area

CDP: County Development Plan

CFRAM: Catchment Flood Risk Assessment and Management

CGS: County Geological Sites

CEMP: Construction Environmental Management Plan

CH4: Methane

CO2: Carbon Dioxide

CSO: Central Statistics Office

C&D: Construction & Demolition

DAA: Dublin Aviation Authority

DMURS: Design Manual for Urban Roads and Streets

DAFM: Department of Agriculture, Food and Marine

DCHG: Department of Culture, Heritage and the Gaeltacht

DECC: Department of the Environment, Climate and Communications

DHLGH: Department of Housing, Local Government and Heritage

DTCAGSM: Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media

DoT: Department of Transport

EIA: Environmental Impact Assessment

EIAR: Environmental Impact Assessment Report

EPA: Environmental Protection Agency

ESB: Electricity Supply Board

EU: European Union

FRA: Flood Risk Assessment

GDSDS: Greater Dublin Strategic Drainage Study

GHG: Greenhouse Gases

HSE: Health Service Executive

IAA: Irish Aviation Authority

LAP: Local Area Plan

LCA: Landscape Character Assessment

LECP: Local Economic and Community Plan

MSW: Municipal Solid Waste

NCCAF: National Climate Change Adaptation Framework

NDP: National Development Plan

NEEAP: National Energy Efficiency Action Plan

NHA: Natural Heritage Area

(p)NHA: (proposed) Natural Heritage Area

NIAH: National Inventory of Architectural Heritage

NPF: National Planning Framework

NIS: Natura Impact Statement

NPWS: National Parks and Wildlife Service

NRA: National Roads Authority

NSAI: National Standards Authority of Ireland

NSOOR: Newbridge Southern Outer Orbital Route

NTA: National Transport Authority

NZEB: Nearly Zero Energy Building

OPW: Office of Public Works

PFRA: Preliminary Flood Risk Assessment

RBMP: River Basin Management Plan

RMP: Record of Monuments and Places

RPS: Record of Protected Structures

RSA: Road Safety Audit

RWMP: Resource and Waste Management Plan

SAC: Special Area of Conservation

SDGs: Sustainable Development Goals

SEA: Strategic Environmental Assessment

SEAI: Sustainable Energy Authority of Ireland

SEAP: Sustainable Energy Action Plan

SFRA: Strategic Flood Risk Assessment

SHD: Strategic Housing Development

SI: Statutory Instrument

SID: Strategic Infrastructure Development

SPA: Special Protection Area

SuDS: Sustainable Drainage Solutions

TII: Transport Infrastructure Ireland

TTA: Traffic and Transport Assessment

UNFCCC: United Nations Framework Convention on Climate Change

WHO: World Health Organisation

1. INTRODUCTION

This Environmental Impact Assessment Report (EIAR) examines the potential impacts and significant effects on the environment of a proposal by Starrus Eco Holding Ltd. (SEHL) to expand the annual waste processing capacity at its existing waste management facility on Ballymount Road Upper, Dublin 24.

1.1 The Applicant

SEHL is the holding company for Panda and Greenstar, two of the largest waste processing companies in Ireland. SEHL is part of the Beauparc group of companies, which is headquartered in Ireland, employs approximately 3,000 people and operates resource recovery operations across over fifty facilities in Ireland, the UK and the Netherlands.

1.2 Development Overview

The existing facility encompasses 1.18 hectares and is occupied by a waste processing building and an office block. It operates under planning permission granted by South Dublin County Council (SDCC) and an Industrial Emissions Licence issued by the Environmental Protection Agency (EPA). The current planning permission and EPA licence authorise the acceptance of 150,000 tonnes of non-hazardous waste annually. The proposed development involves the demolition of the existing buildings, the construction of a new purpose built materials recovery facility (MRF) and increasing the annual waste intake to 350,000 tonnes.

1.3 Need for Environmental Impact Assessment (EIA)

The need for EIA derives from European Union (EU) Directive 85/337/EEC, as amended by Directives 97/11/EC 2003/35/EC, 2009/31/EC, 2011/92/EU and 2014/52/EU) on the assessment of the effects of certain public and private projects on the environment (EIA Directive).

The EIA Directive was initially transposed into Irish law by the European Communities (Environmental Impact Assessment) Regulations, 1989 (S.I. No. 349 of 1989), with subsequent amendments under the Planning and Development Regulations 2001 (SI No. 600 of 2001), as amended. The most recent amendment of the Directive was transposed by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. 296 of 2018).

The primary objective of the EIA Directive is to ensure that projects that are likely to have 'significant effects' on the environment are subject to an assessment of their likely impacts.

The Environmental Protections Agency (EPA)'s *Guidelines on the Information to be contained in Environmental Impact Assessment Report (*May 2022*)* define a staged process to determine if a proposed project requires EIA.

An initial determination is required to establish if the project type falls into any of the activities listed in Annexes I and II of the EIA Directive, as transposed by Parts 1 and 2 of Schedule 5 of the Planning and Development Regulations (PDR) 2001, as amended. If a project is listed in Part 1 then EIA is required. If it is listed in Part 2, but is of a type where the need for EIA is based on a threshold, then

it must be assessed against the thresholds specified in Part 2 of Schedule 5. If the project exceeds the threshold EIA is mandatory.

If the project is not listed in Part 1, but is listed in Part 2 and is below the relevant threshold there is there is no statutory requirement for EIA; however regard must be had to the EIA Directive's 'wide scope and broad purpose' and it may be necessary to go beyond the general project description and consider the component parts and/or any processes in accordance with Schedule 7 of the PDR. If any such parts or processes are significant the proposed project as a whole may fall within the requirements of the Directive.

The proposed development is not listed in Part I of the Schedule 5, but the proposed MRF is listed in Part 2 of the Schedule 'Facilities for the disposal of waste with an annual intake of more than 25,000 tonnes'. For the purposes of the EIA Directive the term 'disposal' included recycling. As the annual waste intake in the MRF will exceed 25,000 tonnes an EIA is required.

1.4 Purpose of an EIAR

An EIAR is defined in the EIA Regulations[1] as '*a report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive*.'

An EIAR is prepared by a developer and is submitted to a Competent Authority as part of a consent process. The Competent Authority uses the information provided in the EIAR to assess the environmental effects of the project and, in the context of other considerations, to help determine if consent should be granted. The information in the EIAR can also be used by other parties to evaluate the acceptability of the proposed project and its effects and to inform their submissions to the Competent Authority.

Article 5 of the EIA Directive requires the information to be provided in the EIAR to at least include:

(a) a description of the project comprising information on the site, design, size and other relevant features of the project;

(b) a description of the likely significant effects of the project on the environment;

(c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;

(e) a non-technical summary of the information referred to in points (a) to (d); and (f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

To ensure the completeness and quality of an EIAR it must be prepared by competent experts.

[1] http://www.irishstatutebook.ie/eli/2018/si/296/made/en/print

1.5 EIA Scoping

The objective of scoping is to identify the key areas of concern related to a project and identify those 'effects' that may reasonably be seen as 'likely'. 'Likely' effects are those that are planned to take place (e.g. earth works, land take, building construction) and those that are the inevitable consequences of the normal operation of the project (e.g. emission, traffic, resource consumption).

The scoping should also determine the need for evaluating reasonably foreseeable 'worst-case' scenarios. This can be achieved by ensuring the description of the project is sufficiently detailed to avoid uncertainty over the direct, indirect and cumulative 'likely significant effects'. Where uncertainty arises, for example where difficulties are encountered in compiling the required information needed to determine the appropriate methodologies, then the 'worst case' effects of the alternative methodologies should be assessed.

An EIA must assess the likely significant effects on the following:

(a) population and human health;

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

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

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

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

The effects must include the expected impacts associated with the vulnerability of the project to risks of major accidents and/or relevant disasters.

O'Callaghan Moran & Associates (OCM) completed a scoping exercise based on the nature of the proposed development, the available baseline information on the subject site and the feedback from the pre-application meeting held with An Bord Pleanála (the Bord). The minutes of the meeting prepared by the Bord are in Appendix 1.1.

1.6 EIAR Methodology

This EIAR presents an evaluation of the likely significant environmental impacts and applicable mitigation and monitoring measures associated with the construction and operation of the proposed development.

The EIAR addresses all of the aspects listed in Schedule 6 of the Planning and Development Regulations 2001 (SI No. 600 of 2001) (as amended), having regard to the requirements of Article 5(1) and Annex IV of Directive 2011/92/EU as amended by Directive 2014/52/EU (the EIA Directive).

The information contained in the EIAR complies with the requirements of Article 5 (1) (a) to (e), Article 3(1) (a) to (e) and Annex IV of Directive 2014/52/EU on the effects of certain public and private projects on the environment. The overall approach took into consideration the guidance and recommendations in the following:

- EPA *Advice Notes for Preparing Environmental Impact Statements (2003).*

- European Commission's *Environmental Impact Assessment of Projects - Guidance on Screening (2017).*

- European Commission's *Environmental Impact Assessment of Projects - Guidance on Scoping Report (2017).*

- European Commission's *Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (2017).*

- Government of Ireland *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018).*

- EPA *Guidelines on the Information to be contained in Environmental Impact Assessment Reports (May 2022).*

Additional legislation and guidance pertinent to the particular environmental factor under consideration are referenced in the relevant Chapters of this EIAR.

The assessment of the effects on climate and water included the implications for climate change both by the development itself and on the development in the operational stage. The assessment of impacts on biodiversity included an evaluation of the significance of effects on Natura 2000 Sites. The effects on population and human health took into consideration the likely effects of traffic, noise, air quality impacts, major accidents and/or natural disasters and the existing local amenities.

The cumulative impacts of existing and permitted projects within one kilometre zone of influence (ZoI) of the subject site were included in the assessment of the effects on Land & Soil, Air, Population and Health and Material Assets: Built Services. This ZoI was determined by the fact that such impacts are effectively mitigated by distance.

The ZoI for climate was defined by the national boundary given Ireland's binding commitments to meet national greenhouse gas emission targets. The ZoI of the Materials Assets: Traffic & Transport was defined by the consultation with SDCC. The ZoI for Cultural Heritage was determined by the development site boundaries.

The ZoI for Biodiversity and Water was determined by the viable pathways between the subject site and the Natura 2000 Sites in Dublin Bay. The ZoI for the Landscape & Visual Impact Assessment was determined by the public view points, including existing residences, permitted developments and the public roads.

The EIA Directive and transposing regulations do not generally require assessment of the need for a proposed development, land-use planning, demographic issues and a detailed socio-economic analysis and the EPA Guidance (2022) states that this should be avoided in an EIAR, unless issues such as economic or settlement patterns give rise directly to specific new developments and associated effects[2]. Given the nature of the proposed development detailed assessments of these aspects have not been considered.

The EIAR follows a grouped format structure, where each relevant topic is dealt with in a separate chapter that describes the baseline conditions (receiving environment), the direct and indirect significant impacts associated with the proposed activity, and the measures to avoid, prevent, reduce or, if possible, offset any identified significant adverse impacts and assesses the effects and the residual impacts.

[2] Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022).

The interactions between impacts on different environmental factors are addressed, as is the potential for the cumulation of many minor or significant effects, including effects of other projects to create larger and more significant effects.

To avoid repetition, Chapter 3 is a detailed description of the Project Characteristics and in the subsequent Chapters only those aspects of the development that are relevant to the environmental factor being assessed are described. Similarly where, as a result of interaction(s) between two or more factors, there is a need for mitigation measures already described in detail in other Chapters these are cross referenced and not repeated.

1.7 Anticipating, Avoiding &, Mitigating Significant Effects

The anticipation of impacts is the most effective means of avoiding adverse effects when applied at the design stage of a project. This involves forming preliminary opinions, usually in the absence of complete data, on the approximate significance, magnitude, character, duration and type of the likely effects.

The anticipation of effects allows the exploration of potential ways to avoid them by sharing the preliminary opinions with the members of the project design team to facilitate changes to the proposed design and method of operation. Where significant adverse effects are likely to occur alternative options must be evaluated to determine the combination that presents the best balance between the avoidance of significant adverse environmental effects and achieving the project objectives.

Avoidance measures are identified through the consideration of alternatives e.g. site location, site layouts, technologies or operational plans and mitigation and any monitoring measures. Consideration of alternatives in the early design stages usually affords the greatest potential for avoidance of significant adverse effects.

1.8 Cumulation of Effects

Cumulative assessment provides the baseline for full environmental assessment of the potential effects arising from the proposed development in combination with other relevant plans and projects.

The identification and detailed assessment of the potential impact of the proposed development in cumulation with other planned and permitted developments in the surrounding area was in accordance with the advice in sections 3.5.7 and 3.7.3 of the EPA Guidelines EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (May 2022) and the requirements of Annex IV(5)(e) of Directive 2014/52/EU,

Section 3.5.7 of the EPA Guidelines on EIAR relates to the description of:

- other related projects that occur as a direct result of the main project, such as a power line, a substation or a road junction upgrade which may result in significant effects;

- off-site projects which include projects specifically required for the project which take place at a distance from the site, often on lands owned by others (such as public roads) and which are sometimes permitted and developed by others; and

- secondary projects that may arise largely because of the existence of the principal project, though they are usually not carried out by the developer of the principal project.

Section 3.7.3 of the EPA Guidelines relates to the 'addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects. While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable; however, it may be necessary to assess the cumulative effects taking account of traffic generated by other permitted or planned projects. It can also be prudent to have regard to the likely future environmental loadings arising from the development of zoned lands in the immediate environs of the proposed project.'

Directive Annex 5 e) requires 'information of the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected, or the use of natural resources'

1.9 Assessment of Effects

Effects were assessed in terms of the likely natural or physical changes to the environment resulting either directly, or indirectly from the proposed development taking into consideration a 'baseline' scenario, cumulative effects, worst case and accidents. Effects are, where possible, described in terms of, quality, significance, extent & context, probability, duration and type listed in the EPA 2022 Guidelines. Effects are also described in accordance with guidance relevant to the particular topic being assessed and, where this occurs, they are referenced in the Chapters.

Quality.

- Positive: A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).

- Neutral: No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

- Negative: A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

Significance.

- Imperceptible: An effect capable of measurement but without significant consequences.

- Not Significant: An effect that causes noticeable changes in the character of the environment, but without significant consequences.

- Slight: An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.

- Moderate: An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends

- Significant: An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment

- Very Significant: An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.

- Profound: An effect which obliterates sensitive characteristics.

Extent & Context.

- Extent: Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.

- Context: Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).

Probability:

- Likely Effects: The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.

- Unlikely Effects: The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Duration:

- Momentary seconds-minutes.

- Brief <1 day.

- Temporary <1 year.

- Short-term 1-7 years.

- Medium Term 7-15 years.

- Long Term 15-60 year.

- Permanent >60 years.

- Reversible effects that can be undone, for example through remediation or restoration.

- Frequency: how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly).

Type.

- Indirect: Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.

- Cumulative: The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.

- Do Nothing: The environment as it would be in the future should the subject project not be carried out.

- Worst Case: The effects arising from a project in the case where mitigation measures substantially fail.

- Indeterminable: When the full consequences of a change in the environment cannot be described.

- Irreversible: When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

- Residual: The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

- Synergistic: Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of air pollutants to produce smog).

The significance of an effect was determined by a combination of objective (scientific) and subjective (social) concerns and the potential for the development to either have significant effect on an aspect of the environment that has been formally or systematically designated as being of importance, or to significantly alter the existing character of some aspects of the environment.

Prevention and mitigation measures and monitoring were only considered for those effects that were deemed likely to be significant.

1.10 Residual Impacts

Residual impacts are the final or intended effects that occur after the proposed mitigation measures have been implemented. It is not always either possible, or practical to mitigate all adverse effects. The effects that remain after all assessment and mitigation are the remaining environmental 'costs' of a proposed development that could not be reasonably avoided and are a key consideration in deciding whether a development should be permitted or not.

1.11 Consultation

1.11.1 *Planning Authority*

Pre planning application meetings were held with South Dublin County Council (SDCC) and with the Bord. The minutes of the meeting with the Bord are in Appendix 1.

1.11.2 *Uisce Eireann*

Pre-connection enquiries were lodged with Uisce Eireann in October 2023 for both water and wastewater connections

1.12 Project Team: Competent Experts

The EIAR was completed by a project team co-ordinated by O'Callaghan Moran & Associates (OCM) who also prepared a number of Chapters. The field surveys and site specific assessments completed by the Project Team were:

- Ecological Assessment by Dixon Brosnan Ecological Consultants;
- Noise & Vibration Assessment by MKO;
- Traffic and Transport Assessment by Systra;
- Air Quality and Climate Assessments by Katestone;
- Photomontage Visuals prepared by Redline Studios;
- Landscape Plan prepared by Hayes Ryan Landscape Architecture;
- Glint & Glare Assessment prepared by MacroWorks;
- Engineering Services Design Report prepared by ORS Consulting Engineers, and
- Construction Environmental Management Plan and Resource and Waste Management Plan prepared by OCM.

The field surveys, assessments and plans were completed and prepared in accordance with best practice and, in the expert opinion of the authors, are considered sufficient to assess the potential significant effects associated with the proposed development.

1.13 Difficulties in Compiling the Required Information

Where difficulties were encountered in compiling the required information these are described in the relevant Chapters.

2. EXISTING SITE DESCRIPTION

This Chapter provides an overview of the proposed development area (site) and is not intended to provide the full baseline information on the receiving environment on which the assessment of impacts is based. This level of detail is provided in Chapters 5 to 14.

2.1 Site Location

The site location is shown on Figure 2.1. It is in the southern end of Ballymount Industrial Estate, to the east of the M50 and south of the Naas Road R110. Access is off the Ballymount Road Upper which runs along the south-western boundary.

2.2 Surrounding Land Use

The land use surrounding the site is predominantly commercial and industrial, as shown on Figure 2.2. The closest large residential areas are approximately 440 m to the west and 800m to the south-east, with the closest individual private residence approximately 40m from the eastern boundary. The lands to the east and north east are currently used for animal grazing; however planning permission (Ref SD22A/099) has been granted for the development of this site comprising 5 warehouse/logistics units 3 office buildings and a café/restaurant.

2.3 Site Layout

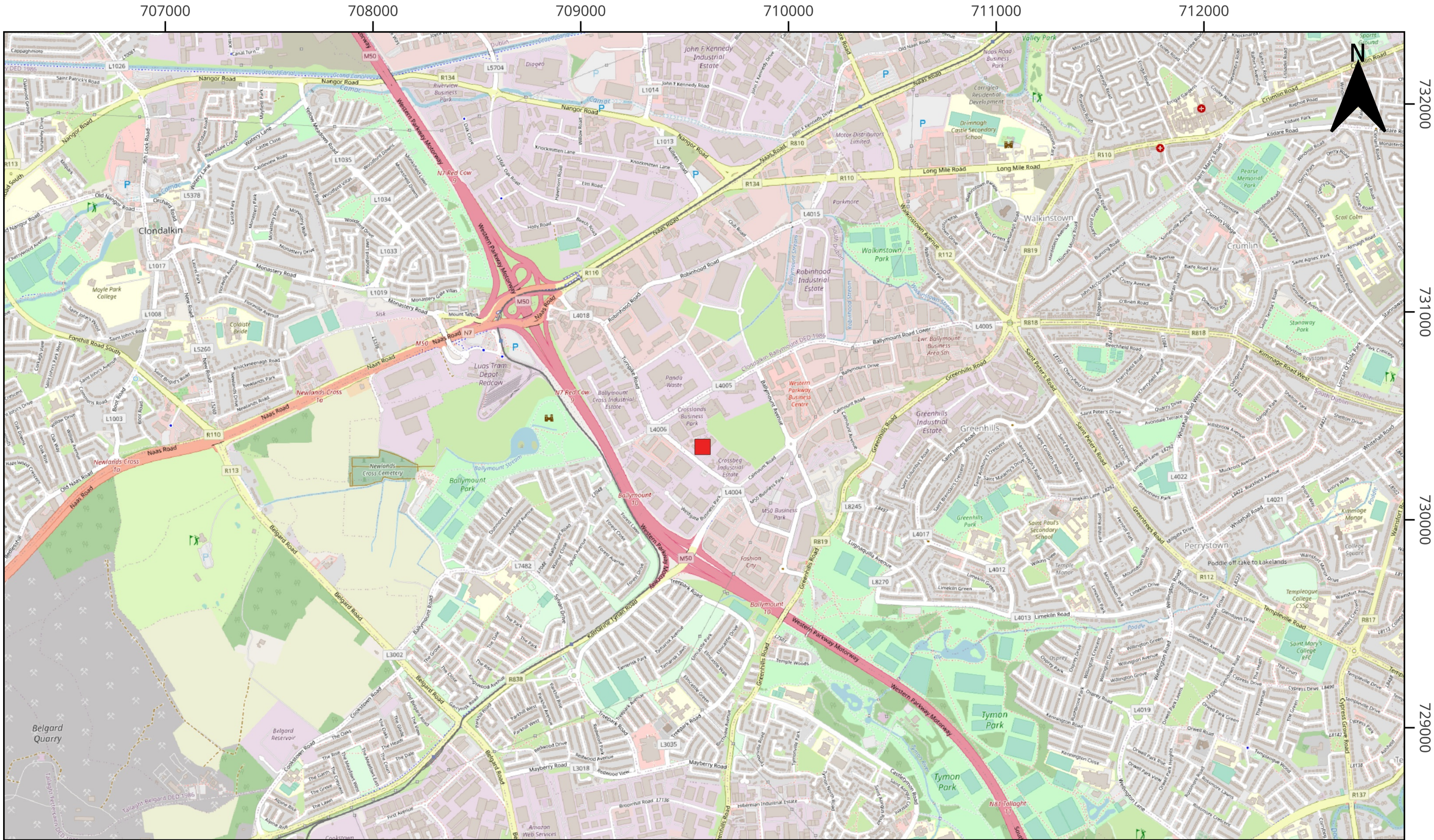
The existing site layout is shown on Drawing No.221244-ORS-ZZ-00-DR-AR-200. The site is generally flat. It slopes gradually from southeast to northwest from approximately 64.95m OD in the southeast to 63.45m OD in the northwest. It encompasses approximately 1.18 hectares and is occupied by a waste transfer building (1,648m^2) comprising two adjoining units, a two storey office block (612m^2), two weighbridges, portakabins and paved operational yards and parking areas. The office housed the staff of a number of Beauparc group companies, but these are being relocated to other facilities.

There is a vehicle wash and hut and fuel storage bund at the eastern boundary, with an open construction and demolition waste storage bay to the north and a timber storage bay to the east of the processing buildings. The entire site is paved, with the exception of some landscaped areas along the front, side and rear boundaries There is a palisade fence along the south eastern, northern and western boundary, with a block wall along the north eastern boundary.

2.4 Regulatory Consents

The facility operates under planning permissions granted by SDCC and an EPA Licence (W0039-02). Both consents authorise the acceptance of 150,000 tonnes/year of non-hazardous municipal waste and commercial and industrial waste of similar composition to municipal waste.

The EPA licence, a copy of which is in Appendix 2.1, specifies the operational and infrastructural controls that must be implemented and the emission limit values that must be achieved to ensure that operations do not give rise to environmental pollution or impairment of amenity outside the facility boundary. .



Environmental Management for Business

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CLIENT
Starrus Eco Holdings Ltd.

TITLE
Site Location

DETAILS
Site Location

0 500 m

FIGURE 2.1

O'Callaghan Moran & Associates

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Model Farm Road, Cork
Tel. (021) 4345366
email: info@ocallaghanmoran.com

Environmental Management for Business

CLIENT
Starrus Eco Holdings Ltd.

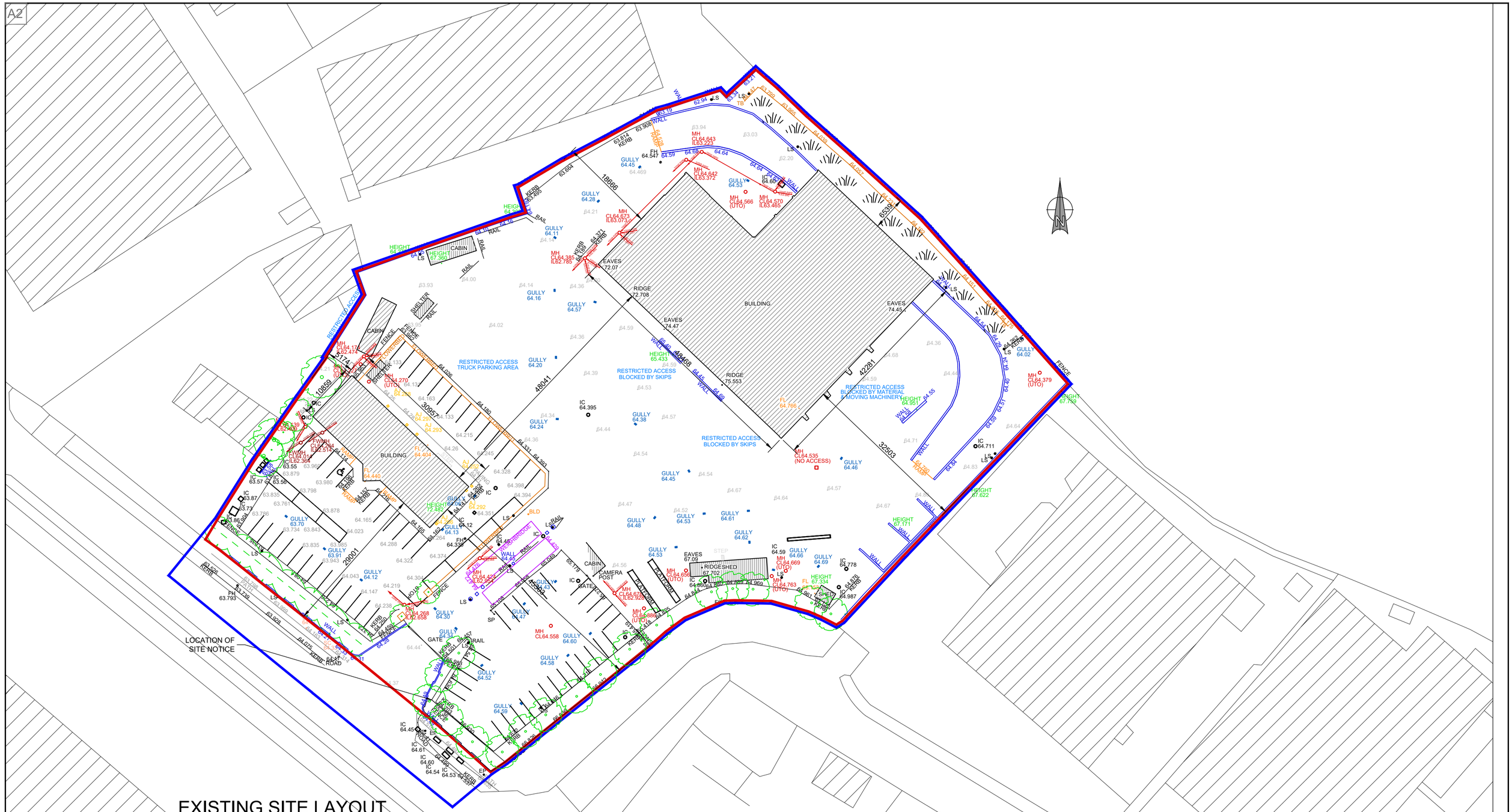
TITLE
Surrounding Land Use

DETAILS
Site Boundary

0 100 m

FIGURE 2.2

A2



EXISTING SITE LAYOUT

SCALE 1:500

INFORMATION

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	02/10/2023	ISSUED FOR COMMENT	CB	CB
P02	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24
TITLE:	EXISTING SITE LAYOUT

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
CB	CB	OD	221244	P02
DATE: 01/12/2023	SCALE: 1:500		DRAWING NO: 221244-ORS-ZZ-00-DR-AR-200	

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The EPA licence also specifies the monitoring that must be carried out to demonstrate compliance with the licence requirements. In addition, the EPA conduct unannounced regulatory compliance inspections and its own independent monitoring to assess compliance with the licence requirements

2.5 Site History

The earliest planning permission (YA/1638) for the site was granted in 1984 and related to the retention of use of the site as a transfer station. In 1994, permission (S94a/0203) was granted for the up-grade of the waste handling facility and these works, which included the construction of a new waste processing building and garage, were completed in 1996. In 1998, permission (S98A/0288) was granted to build a two storey extension to the existing office and this was completed in 2000.

The original EPA licence (W0039-01) was granted in November 1999 and allowed the acceptance of 50,000 tonnes/annum of municipal and commercial and industrial waste. A revised licence (W0039-02), which approved an increase in waste amounts accepted to 150,000 tonnes/year and changes to the operational hours to operate 24 hours a day, 7 days a week, was granted in September 2000.

In June 2012, intruders set fire to 11 refuse collection vehicles parked at the site. A delay in activating a shut off valve on the internal surface water drainage system resulted in the release of contaminated run-off to the municipal storm sewer; however there was no long term negative impacts. In 2015, the EPA amended the licence (IE Amendment) to bring it into conformance with the requirements of the Industrial Emissions Directive.

2.6 Road Network

The road network in the vicinity of the site is shown in Figure 2.3. The facility is accessed via the Ballymount Road Upper. Calmount Road runs north-east from Junction 10 on the M50 to Ballymount Road Upper. It has two lanes in both directions and a speed limit of 60km/hr. The site is on Ballymount Road Upper, which connects Calmount Road with Ballymount Road Lower. It is a single carriageway road with a speed limit of 60km/hr and provides access to the businesses located on both sides of the road. The Calmount Road / Ballymount Road Upper junction is a non-signalised roundabout, where the layout does not allow east to west movements onto Ballymount Road Upper.

Figure 2.3 Local Road Network (Systra)

2.7 Services

The site has connections to the mains water, municipal foul water and electricity supplies and telecoms systems. Rainwater run-off from the roofs and majority of the paved yards discharges to the Uisce Eireann municipal storm sewer via a grit trap and oil interceptor. There is no flow attenuation.

Run-off from the open yards in the vicinity of the truck wash, oil storage tanks and the waste transfer building ramp is discharged to Uisce Eireann municipal foul sewer via an oil interceptor. Sanitary wastewater from the staff welfare facilities also discharges to the municipal foul sewer.

2.8 Facility Management & Staffing

The facility is managed by a suitably qualified and experienced Facility Manager and all facility personnel are provided with appropriate training and have the requisite qualifications and experience to complete their assigned tasks.

SEHL implements an Integrated Management System (IMS) in accordance with the requirements of International Standard Organisation (ISO) 14001 Environmental Management System and Occupational Health and Safety Assessment Series (OHSAS) 18001:2007.

ISO 14001 is an internationally agreed standard that sets out the requirements of a certifiable environmental management system to assist organizations improve their environmental performance through more efficient use of resources, reduction of waste, gaining a competitive advantage and the trust of stakeholders. OHSAS 1800 provides a certifiable framework for the effective management of occupational health and safety including all aspects of risk management and legal compliance.

At a site specific level SEHL has prepared and effectively implements documented procedures and instructions in accordance with the requirements of both the OHSAS 18001:2007, ISO 14001 and the EPA Licence.

Current staff numbers are 25; however until recently an additional 50 administration staff were based in the offices, but these have been redeployed to other SEHL facilities.

2.9 Hours of Operation

The current permitted waste acceptance and operational hours are 24 hours a day, 7 days a week.

2.10 Waste Types & Quantities

The facility is licensed to accept 150,000 tonnes of waste annually. The wastes include:

- Mixed Municipal Waste (Dry Commercial and Domestic and Commercial Black Bin)
- Source Segregated Biodegradable waste (Brown Bin – Commercial and Domestic)
- Mixed Construction & Demolition waste

- Wood

Hazardous waste and liquid wastes are not accepted.

In 2021 the facility accepted 145,000 tonnes of waste, while in 2022 this was 122,927 tonnes. The recovery rates in both years was 97%.

2.11 Waste Acceptance

SEHL has prepared documented waste acceptance procedures to ensure that only suitable wastes are accepted. The wastes are delivered by SEHL collection vehicles and by third parties, including permitted waste collectors and commercial waste producers. The facility does not accept waste from either members of the general public, or from waste contractors that do not have a contract with SEHL.

2.12 Waste Processing

Ferrous, non-ferrous, wood and bulky waste are segregated from the incoming materials using a loading shovel and manually picked, and stored in the building for onward movement. The remaining mixed waste is then bulked up and sent to other authorised waste management facilities for further processing or disposal facilities. The plant and equipment used include loading shovels, track machines, forklifts, a baler and a wrapper.

Delivery and transfer vehicles enter and exit the recycling building via the doors on the western and eastern elevations. The trucks that that transfer waste from the waste processing building enter the ramp from the west and exit to the east.

2.13 Material Storage

Recovered materials are stored inside and outside the buildings in accordance with a Materials and Waste Storage Plan agreed with the EPA, a copy of which is in Appendix 2.2. The Plan takes into consideration the EPA Guidance Note: Fire Safety at Non-Hazardous Waste Transfer Stations, (2013) and the EPA Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, 2016. Any proposal to extend external storage areas must be approved in advance by the EPA.

The wastes stored inside the buildings include unprocessed and processed materials of which there is a maximum of 2,270 tonnes at any one time. The wastes stored outside are tyres, hard plastic, metal, glass, green waste, and timber. The maximum amount of waste stored externally any one time is 826 tonnes.

2.14 Oil Storage

The only hazardous materials used on site are diesel and lubricating oils. The waste collection vehicles based at the site are refuelled from a 30,000 litre steel tank located in a concrete bund area at the eastern site boundary. The mobile plant items are refuelled from a separate tank located in a concrete bund to the south of and adjoining the main tank. The dispensing units for both tanks are inside the bunds.

The bund design meets the requirement of EPA guidelines 'Storage and Transfer of Materials for Scheduled Activities' (2004) and provide 110% of the capacity of each storage tank. The EPA licence requires the bunds to be integrity tested at regular intervals to confirm they remain fit to purpose.

Engine oil and, hydraulic oil are stored on bunded pallets inside the processing building. Odour neutraliser and detergents used to wash the vehicles/bins are stored on bunded pallets inside the power-wash house. An AdBlue dispenser for the trucks is located in a purpose built unit adjacent to the fuel tank bund. The odour neutraliser dosing unit is also located in the quarantine area.

SEHL has a documented procedure on the appropriate handling and storage of potentially polluting substances used at the facility, e.g. oils. The procedure describes how filling the diesel storage tank and refuelling/servicing the mobile plant should be carried out to minimise the risk of accidental spills and ensure that if these occur there is a rapid and effective response.

2.15 Resource Consumption

Site operations involve the consumption of electricity, fossil fuels and water from the mains supply. The consumption rates in 2021 and 2022 are in Table 2.1.

Resources	2021	2022
Diesel	106,967 litres	83,311 litres
Electricity	260,993 kWh	248,349 kWh
Water	1922m^3	3943m^3

2.16 Waste Generation

Waste generated by administration and maintenance activities includes office and canteen waste, waste oils and spent batteries. SEHL implements waste prevention, minimisation and segregation procedures to minimise the amounts of wastes arising and ensure that as much as possible is recycled and recovered. Waste oils and spent batteries are sent for treatment at authorised facilities.

2.17 Nuisance Control

SEHL provides the abatement equipment and implements the operational procedures specified in the EPA Licence to minimise the risk of site activities being a source of nuisance to neighbours and members of the general public. These include measures to mitigate the impacts of noise, dust, litter, odours, vermin and birds.

SEHL has contracted a specialist vermin control company that provides and maintains external bait boxes and also carries out insect control measures as required. Daily odour and litter inspections are carried out by site-staff.

2.18 Complaints

SEHL keeps a written log of all complaints received and the corrective actions implemented. In 2021 and 2022 two complaints were received respectively from members of the public in relation to odours. All were investigated in accordance with EPA requirements and closed out.

2.19 Incidents

The EPA licence requires SEHL to ensure there are systems in place to prevent incidents that have the potential to cause environmental pollution. An incident includes a break down in an item of abatement equipment, an exceedance of an emission limit specified in the EPA licence, a spillage of polluting substances and a fire. When an incident occurs SEHL is obliged to report it to the EPA, investigate the cause and implement the appropriate corrective actions. The EPA classify environmental incidents into the following categories based on the potential impact on the environment:

- Minor
- Limited
- Serious
- Very Serious
- Catastrophic

In 2021 and 2022 there were no notifiable incidents.

2.20 Emissions

2.20.1 *Noise*

The waste processing is a source of continuous noise emissions. Waste transport vehicles, staff private cars and the mobile plant are sources of intermittent emissions occurring during the waste acceptance and processing hours. Condition 7.3 of the IE licence stipulates that there shall be no clearly audible tonal component or impulsive component in the noise emissions from the activity at the noise sensitive locations.

2.20.2 *Surface Water*

The emissions to surface water comprise rainwater run-off from the building roofs and yards. This is weather dependent and periodic. Schedule F3 of the IE licence specifies the following emission limits for the discharge to the storm water sewer:

- Biochemical Oxygen Demand (BOD) 20 milligrams/litre (mg/l)
- Suspended Solids 30 mg/l
- Fats Oil and Grease 10 mg/l
- pH 6-10

2.20.3 *Foul Sewer*

Sanitary wastewater, the wash water from the truck wash and run-off from the open yards in the vicinity of the truck wash, oil storage tanks and the waste processing building ramp is discharged to foul sewer via interceptors.

This is periodic, depending on operations and the weather. Schedule F3 of the IE licence specifies the emission limit values for pollutants present in the wastewater discharge and these are listed in Table 2.3.

Table 2.3 Foul Sewer Discharge Limits

F.1 Emissions to Sewer

Table F.1 Emissions to Sewer [Note 1]

Parameter	Emission Limit Value		
	Grab Sample (mg/l)	Daily Mean Concentration (mg/l)	Daily Mean Loading (kg/day)
Biological Oxygen Demand	2000	1500	30
Chemical Oxygen Demand	4000	3000	60
Suspended Solids	1000	800	16
Fats, Oils, Grease	100	100	2
PH	6 - 10		
Maximum Temperature	42 °C		
Detergents (as MBAS)	100	100	2

Note 1: Maximum volume to be discharged in any one day: 20 cubic metres,
Maximum rate per hour: 5 cubic metres.

2.20.4 *Air*

The commercial black bin waste and brown bin waste are sources of odours. In dry weather vehicles travelling across paved areas are a potential source of dust emissions. Vehicle and mobile plant exhausts contain a range of compounds that affect air quality, for example carbon monoxide, methane, carbon dioxide, and particulates.

2.20.5 *Ground & Groundwater*

There no direct or indirect emissions to ground and groundwater.

2.21 Emission Controls

The EPA licence specifies the emission controls that SEHL is obliged to implement to ensure operations do not cause environmental pollution and do not give rise to nuisance or impairment of amenity outside the site boundary.

2.21.1 *Noise*

All waste reception and processing is carried out inside the buildings.

2.21.2 *Surface Water & Groundwater*

Condition 10.2 of the EPA licence requires SEHL to have an adequate supply of containment booms and/or suitable absorbent material on-site to contain and absorb any spillage at the facility. Once used the absorbent material must be disposed of at an appropriate facility

Condition 4.4.2 requires that all tank and drum storage areas must be impervious to the stored materials and that all storage areas be bunded, either locally or remotely, to a volume not less than the greater of the following:

a) 110% of the capacity of the largest tank or drum within the bunded area; or

b) 25 % of the total volume of substances, which could be stored within the bunded area

2.21.3 *Air*

2.21.3.1 Dust

Waste processing is carried out inside the waste transfer building. SEHL cleans the paved yards and building floors regularly using a road sweeper and damps down the yard using hoses in dry periods.

2.18.3.2 Vehicle Exhausts

The diesel fuelled heavy goods vehicles based at the facility are fitted with Selective Catalytic Reduction (SCR) systems. A diesel fuel additive (AdBlue) is used in the SCR to reduce the nitrous oxide levels in the exhaust gases.

2.18.3.3 Odours

SEHL has prepared an Odour Management Plan (OMP) that specifies the control measures that are implemented to ensure operations do not cause off-site odour nuisance. A copy of the current OMP, which has been reviewed by the EPA, is in Appendix 2.3. The control measures include:

- Preventive maintenance programmes in place for all equipment and building structures. This includes the odour suppression system and mobile plant.
- Odour neutralising agent is added to a misting system located on doorways to waste transfer buildings including loading pit to prevent the escape of any potential nuisance odours from the waste on site.
- Frequent checks to ensure odour nuisance is not caused outside the facility boundary.
- Cleaning of concreted surfaces leading to weighbridges and entrance to buildings daily. Road sweeper is scheduled daily.
- All staff on site have the responsibility to immediately report and act on potential odour source from any other waste stream, any odour detected to be reported, even from outside sources).
- In the event of odour being detected the corrective action procedure must be implemented immediately.
- Ensuring cladding is in place on all areas of the building.
- Building floor cleaned regularly.

- All trailers incoming/outgoing are not to park in the yard and queues to be kept to the minimum. All loading, unloading, tipping of odorous materials are to only be loaded inside the shed. All trailers must be sealed and over on before entering or exiting the baling shed.

2.22 Environmental Monitoring

Environmental monitoring is carried out in accordance with Condition 6 and Schedule C of the EPA Licence which requires the following:

- Noise — Annually
- Dust Deposition — Three times per year
- Storm Water — Weekly (Visual Inspection) & Quarterly (Monitoring)
- Emissions to Sewer — Quarterly
- Groundwater — Annually

The results of the monitoring are submitted to the EPA and are publically accessible.

2.23 Safety & Hazard Control

SEHL has adopted an Accident Prevention Policy and has prepared a Safety Statement for the site that makes provision for hazard identification and risk assessment. All personnel and visitors are obliged to comply with site guidelines regarding access to and from the facility and on-site traffic movement. All site personnel are provided with and are obliged to wear, personal protective equipment (PPE) appropriate for their particular functions. PPE includes facemasks, gloves, safety glasses, steel-toed footwear, overalls, reflective jackets and helmets.

2.24 Accidents and Emergencies

An emergency is an accident/incident that has the potential to result in harm to human health, damage to off-site assets and give rise to environmental pollution. The EPA licence requires SEHL to prepare an Emergency Response Procedure (ERP) and ensure that all staff are made aware of their requirements. A copy of the current ERP is in Appendix 2.4.

The ERP identifies all potential hazards at the site that may cause damage to the environment and also specifies roles, responsibilities and actions required to deal quickly and efficiently with all foreseeable major incidents and to minimise environmental impacts.

SEHL has documented procedure on the handling and storage of potentially polluting substances used at the facility, e.g. oils and the filling of tanks and mobile plant. The procedure describes how filling the fuel storage tanks and refuelling/servicing the mobile plant should be carried out to minimise the risk of accidental spills and ensure that if these occur there is a rapid and effective response.

2.25 Fire Safety

2.25.1 *General Prevention Measures*

To prevent/reduce risk of arson there is a security fence around the facility and the entrance gate is locked in the event of a temporary closure.

Members of the public do not have access to the facility and only authorised personnel are permitted inside the waste processing buildings. Site visitors are informed of the safety and fire prevention procedures that must be followed while they are on site. There is a policy of only smoking in designated areas.

Safe systems of work are in place and service contractors are obliged to undergo safety inductions before getting access to operational areas. The inductions address fire procedures, behaviour on site, housekeeping and specific high risk jobs i.e. hot works procedure and permits.

2.25.2 *Fire Spread*

To limit the spread of potential fires, wastes are stored as follows:

- 6m separation distance between combustible waste stockpiles;
- 6m separation distance between waste stockpiles and the site perimeter or adjacent infrastructure/materials.

2.25.3 *Fire Detection Systems*

General fire detection and warning measures are maintained throughout the site.

2.25.4 *Fire Suppression*

Fire extinguishers and hose reels are positioned at strategic locations recorded in Fire Register. The extinguishers are subject to annual inspection and replenishment/replacement as required by a fire safety contractor.

Site staff are trained to extinguish small fires with appropriate hand held fire extinguishers as per the site Fire Explosion Procedure. If staff members cannot tackle a fire safely and effectively, the evacuation of all personnel is the primary priority. Emergency exit doors are provided in all of the buildings and fitted with emergency exit signs with back-up lighting.

2.25.5 *Firewater Retention*

An assessment of firewater retention requirements was completed in 2017 and a copy of the report is in Appendix 2.5.

2.26 Environmental Liabilities Risk Assessment

SEHL has, as required by the EPA licence, completed an environmental liability risk assessment (ELRA) that assesses the environmental effects, including impacts on humans, of foreseeable incidents and worst case incidents and identifies the scope of the remedial measures to effectively mitigate those

effects. The 'worst case' accident is a large scale fire. The EPA has approved the ELRA and a financial provision has been put in place to underwrite the costs.

2.27 Decommissioning

Although the facility does not have a defined lifetime, SEHL has prepared a Decommissioning Management Plan (DMP) for the existing facility, as required by the current EPA licence. The Plan defines the scope of the decommissioning which includes the removal of all wastes and hazardous substances, clean out of all tanks and buildings, and disconnection of service

The Plan identifies the actions that will be taken to ensure that the decommissioning works will not cause environmental pollution and that when complete the site will not present any significant risk of environmental pollution. The Plan was submitted to and approved by the EPA and a financial provision has been agreed with the EPA to underwrite cost of an unexpected closure.

3. PROJECT CHARACTERISTICS

This Chapter presents an overview of the European Union (EU) and national waste polices to provide a context for the proposed development. It describes the characteristics of the project, including the nature and scale of the development; building design considerations; services including water supply, sanitary wastewater, process wastewater and storm water management; landscape strategy; the operational stage processes and associated emissions and the construction stage works. It also identifies the permitted and proposed developments that have been taken into consideration for the assessment of cumulative effects.

3.1 Context

3.1.1 *European Commission Action Plan on the Circular Economy*

The purpose of the European Commission's (Commission) Action Plan on the Circular Economy[3] is to transition the EU to an economy where the value of products, materials and resources is maintained for as long as possible and the generation of waste minimised. This transition is essential to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy.

The Commission recognises that recycling is a pre-condition for a circular economy, where resources and materials can be recycled, returned back to the economy and used again, meaning that what was once considered a waste becomes a valuable resource. To achieve this, materials at the end of their life cycle should be recovered through recycling and ideally reintroduced to the product lifecycle. These "secondary raw materials" can then be traded like primary raw materials.

3.1.2 *National Waste Action Plan for a Circular Economy*

In 2020, the government published its 'Waste Action Plan for a Circular Economy' to take cognisance of the Commission' Action Plan on the Circular Economy. The objective is to inform and direct waste planning and management in Ireland over the coming years. While the thrust of the Plan is to prevent waste arising through reuse, its objectives include ensuring measures are introduced to support sustainable economic models (for example by supporting the use of recycled over virgin materials).

The Plan promotes the development – for environmental and economic reasons – of adequate and appropriate treatment capacity to ensure that the full circularity and resource potential of materials is captured in Ireland.

In 2022, The Circular Economy and Miscellaneous Provisions Act 2022 was enacted to underpin Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in the economy for as long as possible and significantly reduce greenhouse gas emissions.

[3] https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

3.1.3 *South Dublin County Development Plan 2022-2028*

It is a strategic aim of the South Dublin County Development Plan 2022-2028 to continue to support and promote Government policy on eliminating landfill; reducing the amount of waste produced, maximising waste as a source of products and renewable energy and prioritising waste prevention, re-use, recycling and recovery over the disposal of waste.

The Development Plan waste management policies and objectives support a move towards achieving a 'circular economy' which is essential if SDCC and the wider Eastern Region is to make better use of resources and become more resource efficient. The waste policies and relevant to the proposed development are:

- **Policy QDP11: Materials, Colours and Textures –** *QDP11 Objective3*: To promote the reuse and recycling of materials to promote the circular economy and reduce construction and demolition waste.

- **Policy EDE 2: Green Economy –** *EDE2 Objective 2* to support the growth of business in the green and circular economy and the initiatives within the IDA strategy "Driving Recovery and Sustainable Growth" (or any superseding documents), including growth and transformation, where it promotes sustainable job creation in South Dublin County.

- **Policy EDE 2: Green Economy –** *EDE2 Objective 4 t*o support the measures in South Dublin's *Climate Change Action Plan (2019-2024),* or any superseding plan, to integrate the Circular Economy approach with economic development initiatives, in order to optimise opportunities in design and operation to reduce energy and material consumption and recycling of materials in support of sustainable development.

- **Policy IE 7: Waste Management –** Implement European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes.

- **IE7 Objective 1**: To encourage a just transition from a waste management economy to a green circular economy to enhance employment and increase the value, recovery and recirculation of resources through compliance with the provisions of the *Waste Action Plan for a Circular Economy* 2020-2025 and to promote the use of, but not limited to, reverse vending machines and deposit return schemes or similar to ensure a wider and varying ways of recycling.

- **IE7 Objective 2**: to support the implementation of the *Eastern Midlands Region Waste Management Plan 2015-2021* or as amended by adhering to overarching performance targets, policies and policy actions.

- **IE7 Objective 3**: To provide for, promote and facilitate high quality sustainable waste recovery and disposal infrastructure/technology in keeping with the EU waste hierarchy and to adequately cater for a growing residential population and business sector.

- **IE7 Objective 4**: To provide for and maintain the network of bring infrastructure (for example, civic amenity facilities, bring banks) in the County to facilitate the recycling and recovery of hazardous and non-hazardous municipal wastes.

- **IE7 Objective 9**: To support the development of indigenous capacity for the treatment of non-hazardous and hazardous wastes where technically, economically and environmentally practicable subject to the relevant environmental protection criteria for the planning and development of such activities being applied.

3.1.4 *Waste Management Plan for the Eastern-Midlands Region*

The Waste Management Plan for the Eastern-Midlands Waste Region (EMWR) Plan is the framework for the prevention and management of wastes in a safe and sustainable manner. The scope of the EMWR Plan is broad and provides policy direction, sets out waste management objectives and is a roadmap of actions to achieve those objectives. The EMWR Plan is a statutory document prepared by the local authorities of the region and covers the period from 2015 to 2021. It remains in force until a new National Waste Management Plan is adopted.

Efforts to decouple waste generation from economic growth have not yet been successful and the economic recovery that started in 2014, in conjunction with population growth, has resulted in a continuing increase in the quantities of waste arising, both nationally and in the Greater Dublin Area.

The EMWR Plan estimates that the increase in municipal wastes (combined household and commercial) between 2012 and 2021 will be in the region of 2-3% annually. It concludes that growth at the higher rates presents a challenge to the region to ensure adequate collection and treatment capacity is required. Furthermore, the need to treat more of these wastes in the country in support of Circular Economy initiatives means that treatment capacity needs to increase above the projected rates, making the provision of capacity even more challenging.

To ensure that national and regional recovery and recycling targets are met, to minimise the amount of waste disposed to landfill and to roll out circular economy initiatives there is a need to increase indigenous waste recycling and recovery capacity.

3.2 Proposed Development

Due to a combination of economic factors, increasing population, national waste recycling and recovery policies and circular economy initiatives there is a need to maximise waste processing efficiencies in the South Dublin County Council administrative area. The proposed development will consolidate SEHL's processing capacity currently provided by the existing facility and the nearby SDCC owned Baling Station, which is leased and operated by SEHL, into one purpose built materials recovery facility (MRF).

The existing facility was constructed in 1996 is 27 years old and was designed to serve primarily as a waste transfer station, where incoming materials would be bulked up and sent to other authorised facilities for treatment and/or disposal. The authorised annual waste acceptance rate is 150,000 tonnes. Over time the facility transitioned from a transfer station to a recovery/recycling plant through the introduction of processing equipment to segregate out recovery and recyclable materials from the residual non-recyclable/recoverables. However the building design and size impose operational inefficiencies on the processing equipment.

The SDCC Baling Station and Civic Amenity Area, which is located 1.5km from the proposed development site, was also constructed in 1996 and was designed as a transfer station for municipal solid waste collected by SDCC, where the incoming materials were compacted and baled and then sent to the SDCC landfill at Arthurstown in Kill, County Kildare. SDCC

The landfill closed in 2010 and SEHL leased the Baling Station from SDCC in 2014. The baling units were decommissioned and processing plant was installed in the former waste reception hall. The authorised annual waste intake is 324,000 tonnes and in 2022 it accepted 197,000 tonnes of waste, which included wastes delivered by waste collectors and wastes dropped off at the Civic Amenity Area.

As part of the City Edge Project the land zoning has been changed to REGEN in the South Dublin Development Plan, with the objective of future redevelopment for housing. This means it is not viable for SEHL to rely on the future availability of the Baling Station.

The proposed development will involve:

- The demolition of the office (612m^2) and waste transfer building (1648m^2);
- The removal of the portakabins, truck wash and external storage bays;
- The relocation of the weighbridges;
- The relocation of the vehicle entrance
- The removal of eight (8 No) Sycamores along the line of new site entrance, three (3 No) along the western boundary and three (3No) along the northern boundary.
- The construction of a new MRF (4,710m^2), which will have roof mounted solar panels and an odour control unit;
- The provision of a SuDs based storm water drainage system that maximises infiltration to ground, while complying with EPA requirements on firewater retention;
- Provision of a noise barrier along the south-eastern boundary:
- Provision of an electrical substation, and
- Increasing the permitted annual waste intake from 150,000 to 350,000

3.3 Proposed Site Layout

The proposed layout is shown on Drawing No. 221244-ORS-Z0-00-DR-AR-203. It will comprise the MRF (4710m^2) including staff welfare facilities and a small site office, an electricity substation, acoustic barrier, two relocated weighbridges and new foul and surface water drainage systems.

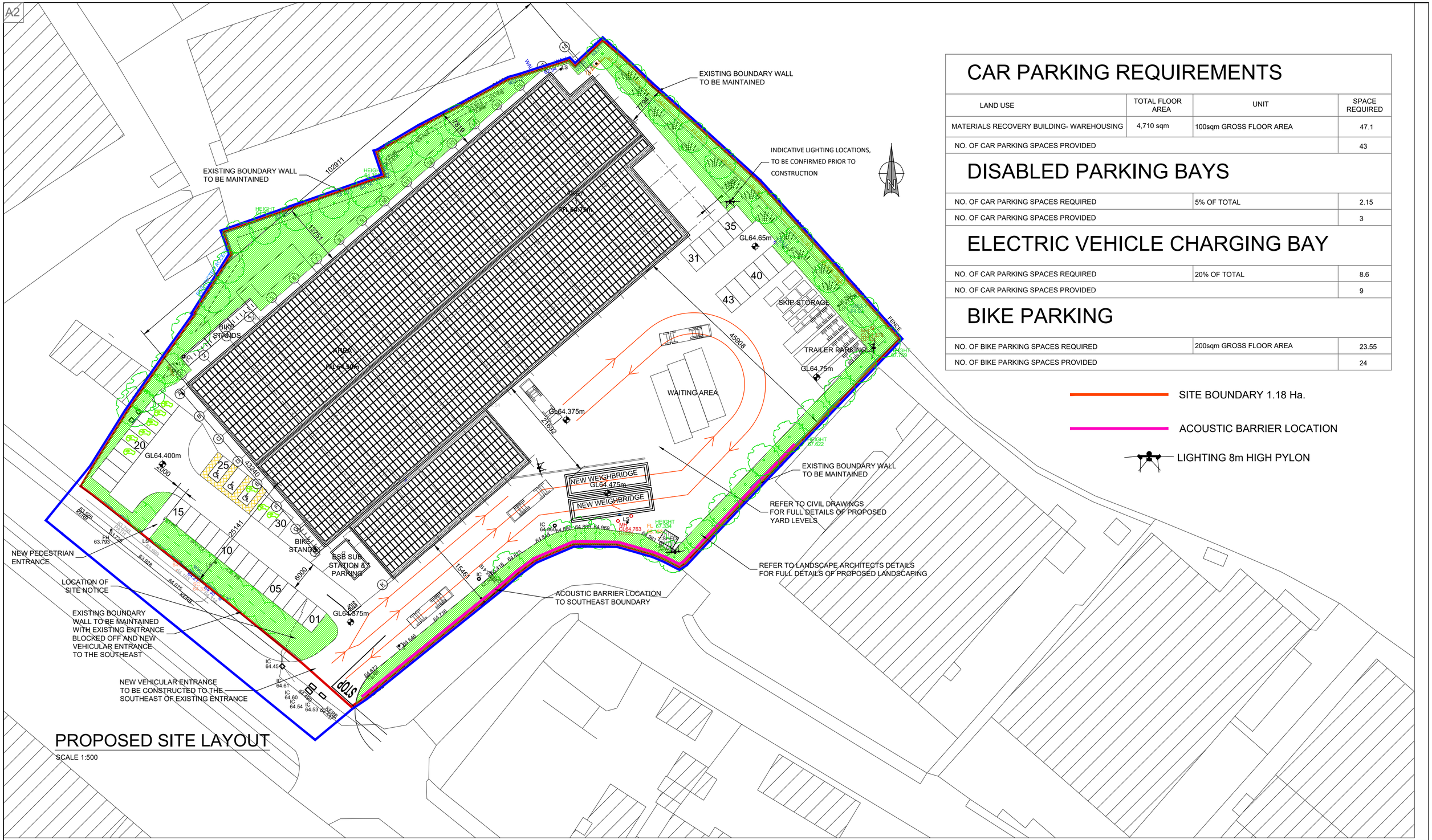
3.3.1 *Landscape Strategy*

The location is quite industrial, nonetheless less the objective was to visually soften the development retaining existing trees where possible along the eastern and western boundaries, together with supplementary planting to integrate the facility as much as possible and in particular to provide substantial buffering between the facility and the adjacent road, and to frame and visually soften the proposed extensive building footprint structure and associated hardstanding areas, boundary security fences, walls and acoustic fencing to the east.

3.4 Access

The site will continue to be accessed directly from the Ballymount Road Upper via a new entrance.

A2



PROPOSED SITE LAYOUT

SCALE 1:500

CAR PARKING REQUIREMENTS

LAND USE	TOTAL FLOOR AREA	UNIT	SPACE REQUIRED
MATERIALS RECOVERY BUILDING- WAREHOUSING	4,710 sqm	100sqm GROSS FLOOR AREA	47.1
NO. OF CAR PARKING SPACES PROVIDED			43

DISABLED PARKING BAYS

NO. OF CAR PARKING SPACES REQUIRED	5% OF TOTAL	2.15
NO. OF CAR PARKING SPACES PROVIDED		3

ELECTRIC VEHICLE CHARGING BAY

NO. OF CAR PARKING SPACES REQUIRED	20% OF TOTAL	8.6
NO. OF CAR PARKING SPACES PROVIDED		9

BIKE PARKING

NO. OF BIKE PARKING SPACES REQUIRED	200sqm GROSS FLOOR AREA	23.55
NO. OF BIKE PARKING SPACES PROVIDED		24

SITE BOUNDARY 1.18 Ha.

ACOUSTIC BARRIER LOCATION

LIGHTING 8m HIGH PYLON

INFORMATION

Figured dimension only to be taken from this drawing.
All dimensions to be checked on site.
Consultants to be informed immediately of any discrepancies before work proceeds.

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	10/05/2023	ISSUED FOR COMMENT	CB	CB
P02	12/06/2023	SITE LAYOUT UPDATED	CB	CB
P03	12/07/2023	BUILDING AND SITE LAYOUT UPDATED	CB	CB
P04	28/08/2023	BUILDING LAYOUT UPDATED	CB	CB
P05	02/10/2023	ISSUED FOR COMMENT	CB	CB
P06	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24
TITLE:	PROPOSED SITE LAYOUT

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
CB	CB	OD	221244	P06
DATE: 01/12/2023	SCALE: 1:500		DRAWING NO: 221244-ORS-Z0-00-DR-AR-203	

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ISO 9001:2015 QUALITY ASSURED COMPANY

3.5 Building Design & Layout

The building elevations and sections are shown on Drawing No. 221244-ORS-Z0-00-DR-AR-206. The building will be a steel portal frame structure, with external preformed and profile sheeting on the walls and low pitch roof cladding. It will be 11.02m to the eves, with an upper ridge level of 13.30m above ground level. Fast acting roller shutter doors and an Odour Control Unit (OCU) will be located on the south-east elevation.

The building floor plan is shown on Drawing No 221244-ORS-Z0-00-DR-AR-204. An office and staff welfare facilities will be located in the south-western end and there will designated areas for the reception and processing of the materials and quarantine areas will be provided for the temporary storage of materials not suitable for recovery/recycling.

The building roof plan is shown on Drawing No 221244-ORS-Z0-00-DR-AR-205. Approximately 4,351 m^2 of solar panels will be installed.

3.6 Facility Management

The existing management team will remain in place and all facility personnel will continue to be provided with appropriate training and have the requisite qualifications and experience to complete their assigned tasks. The current Integrated Management System (IMS) that meets the requirements of International Standard Organisation (ISO) 14001 Environmental Management System and Occupational Health and Safety Assessment Series (OHSAS) 18001:2007 will be implemented.

3.7 Operational Hours & Staffing

The MRF will operate 24 hours a day, 7 days a week and there will be approximately 24 full time staff comprising management, administration and general operatives.

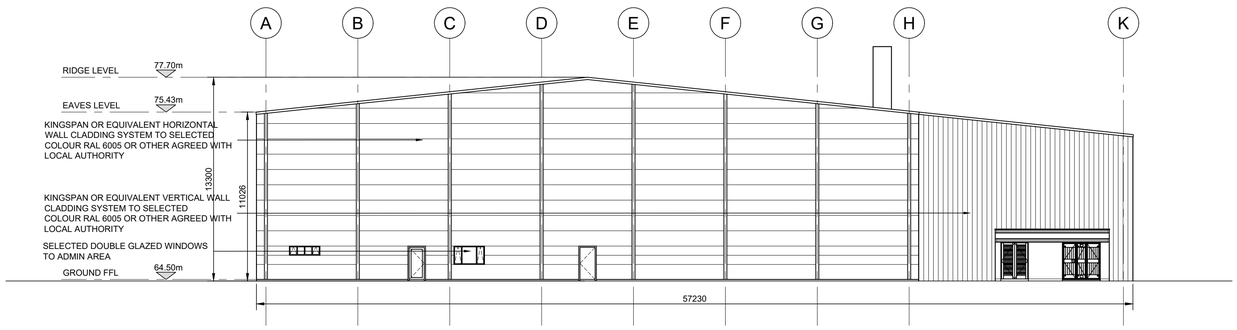
3.8 Waste Types & Quantities

The wastes will include:

- Commercial and Domestic Dry Mixed Recyclables (DMR);
- Commercial and Domestic Mixed Residual Waste-Black Bin;)
- Commercial and Domestic Source Segregated Biodegradable Waste -Brown Bin;
- Source Segregated Commercial Dry Recyclables, and
- Mixed Construction & Demolition Waste.

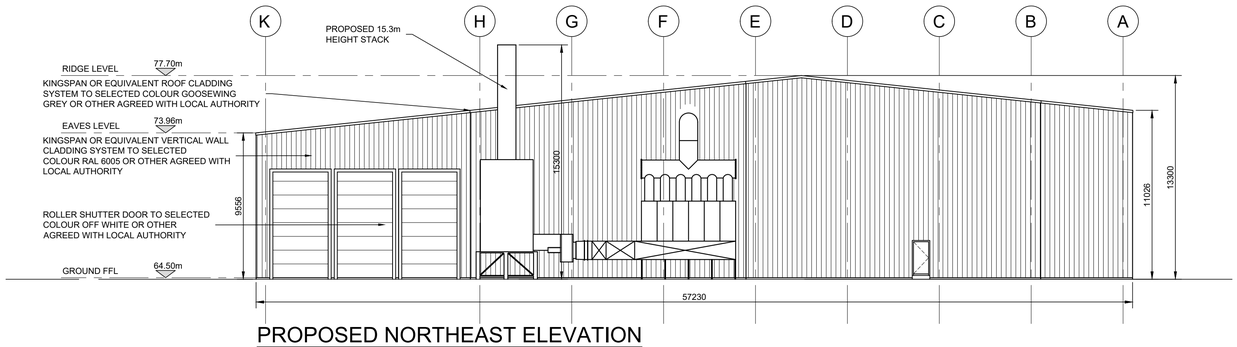
The maximum annual intake will be 350,000 tonnes.

A1



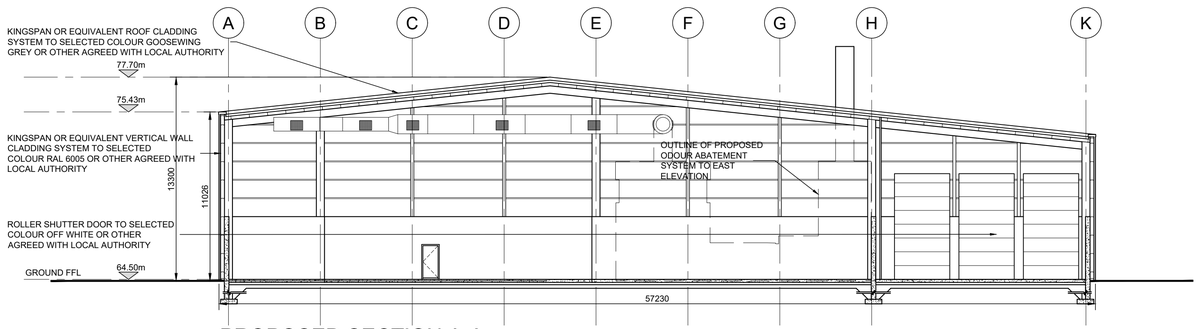
PROPOSED SOUTHWEST ELEVATION

SCALE 1:200



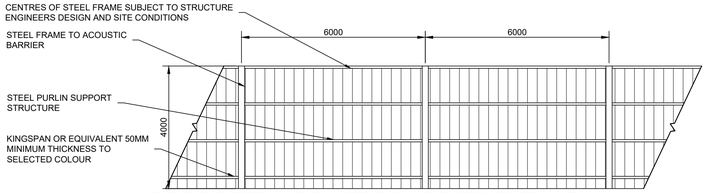
PROPOSED NORTHEAST ELEVATION

SCALE 1:200



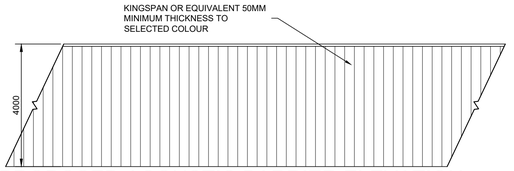
PROPOSED SECTION A-A

SCALE 1:200



PROPOSED ACOUSTIC BARRIER ELEVATION

SCALE 100



PROPOSED ACOUSTIC BARRIER ELEVATION

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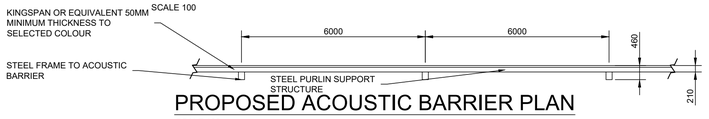
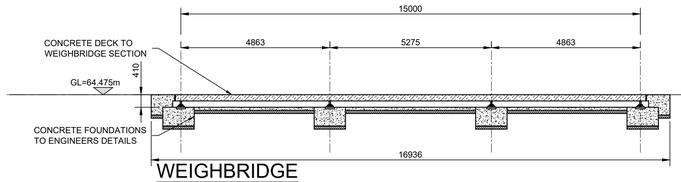


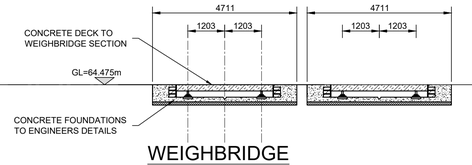
PROPOSED ACOUSTIC BARRIER PLAN

SCALE 100



WEIGHBRIDGE

SCALE 100



WEIGHBRIDGE

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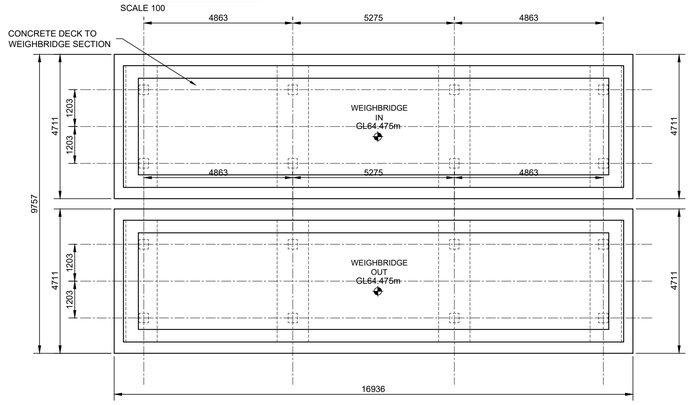

WEIGHBRIDGE

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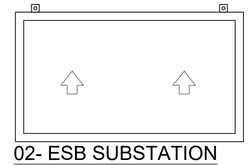
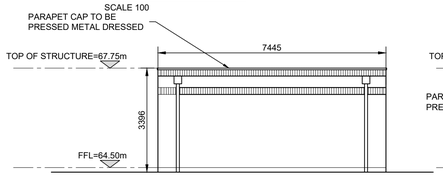


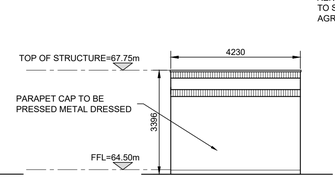
02- ESB SUBSTATION ROOF PLAN

SCALE 1:100



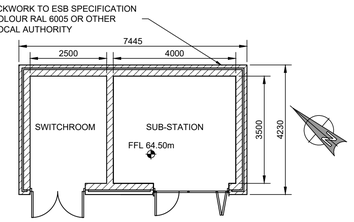
ESB SUBSTATION NORTHEAST

SCALE 1:100



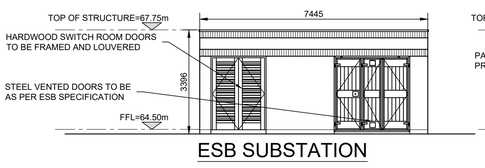
ESB SUBSTATION NORTHWEST

SCALE 1:100



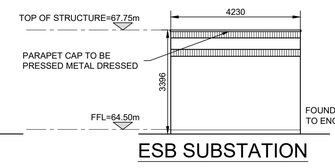
ESB SUBSTATION FLOOR PLAN

SCALE 1:100



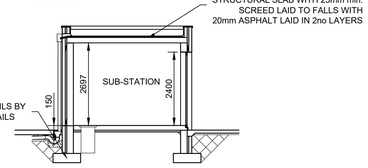
ESB SUBSTATION SOUTHWEST

SCALE 1:100



ESB SUBSTATION SOUTHEAST

SCALE 1:100



ESB SUBSTATION TYPICAL SECTION

SCALE 1:100

INFORMATION

Figured dimension only to be taken from this drawing.
All dimensions to be checked on site.
Consultants to be informed immediately of any discrepancies before work proceeds.

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	10/05/2023	ISSUED FOR COMMENT	CB	CB
P02	12/06/2023	SITE LAYOUT UPDATED	CB	CB
P03	12/07/2023	BUILDING AND SITE LAYOUT UPDATED	CB	CB
P04	28/08/2023	BUILDING LAYOUT UPDATED	CB	CB
P05	02/10/2023	ISSUED FOR COMMENT	CB	CB
P06	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24
TITLE:	PROPOSED ELEVATIONS, ACOUSTIC BARRIER, WEIGHBRIDGE & SUBSTATION

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
CB	CB	OD	221244	P06
DATE: 01/12/2023	SCALE: 1:200		DRAWING NO: 221244-ORS-Z1-ZZ-DR-AR-206	

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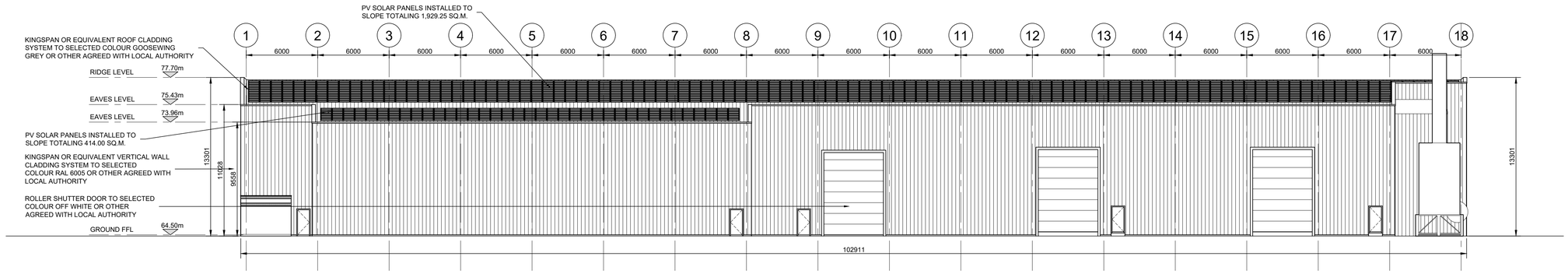
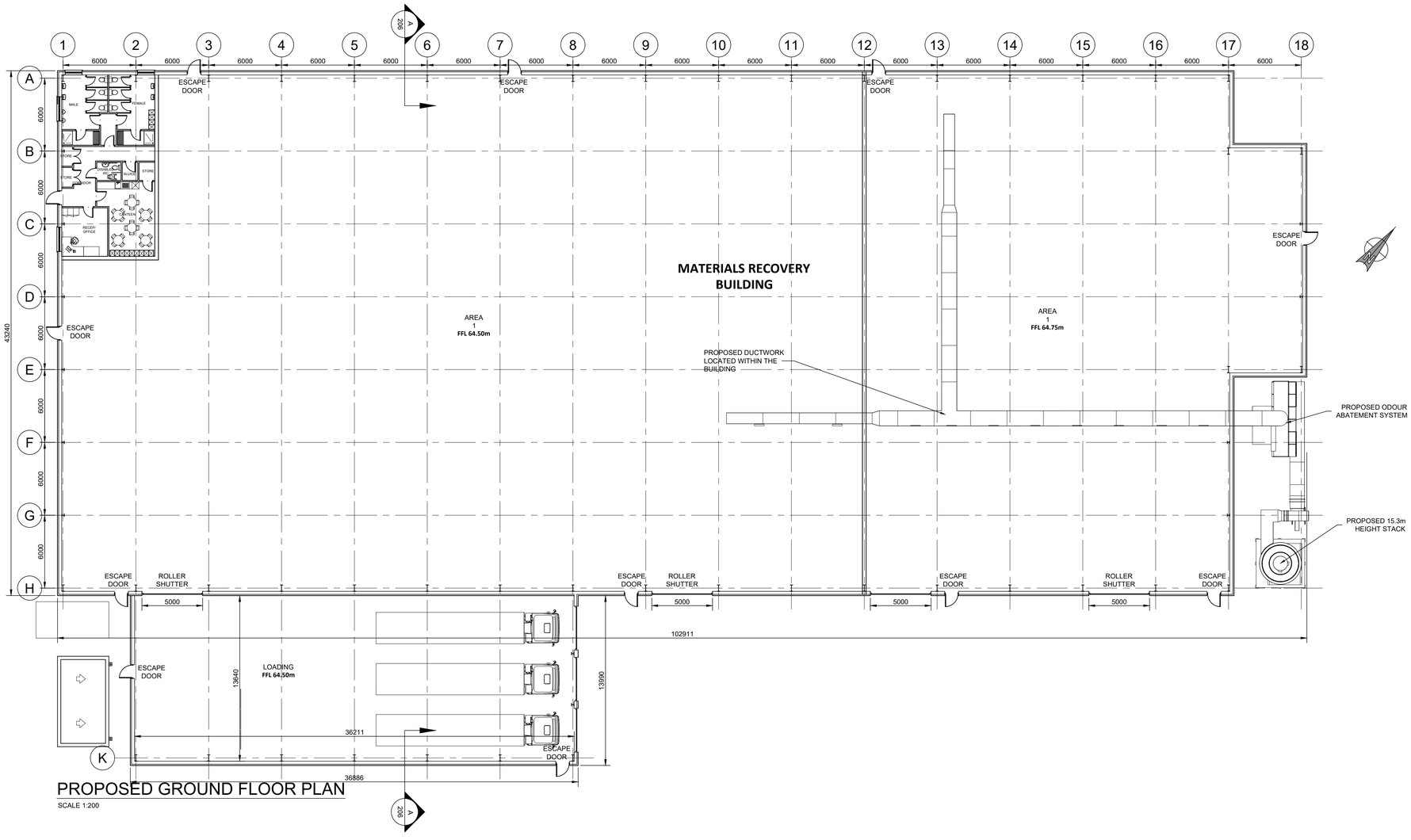
A1



PROPOSED SOUTHEAST EXISTING

SCALE 1:200



PROPOSED GROUND FLOOR PLAN

SCALE 1:200

INFORMATION

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	10/05/2023	ISSUED FOR COMMENT	CB	CB
P02	12/06/2023	SITE LAYOUT UPDATED	CB	CB
P03	12/07/2023	BUILDING AND SITE LAYOUT UPDATED	CB	CB
P04	28/08/2023	BUILDING LAYOUT UPDATED	CB	CB
P05	02/10/2023	ISSUED FOR COMMENT	CB	CB
P06	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)			
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24			
TITLE:	PROPOSED GROUND FLOOR PLAN AND PROPOSED ELEVATION			
DRAWN: CB	CHECKED: CB	APPROVED: OD	JOB NO: 221244	REV: P06
DATE: 01/12/2023	SCALE: 1:200		DRAWING NO: 221244-ORS-Z1-ZZ-DR-AR-204	

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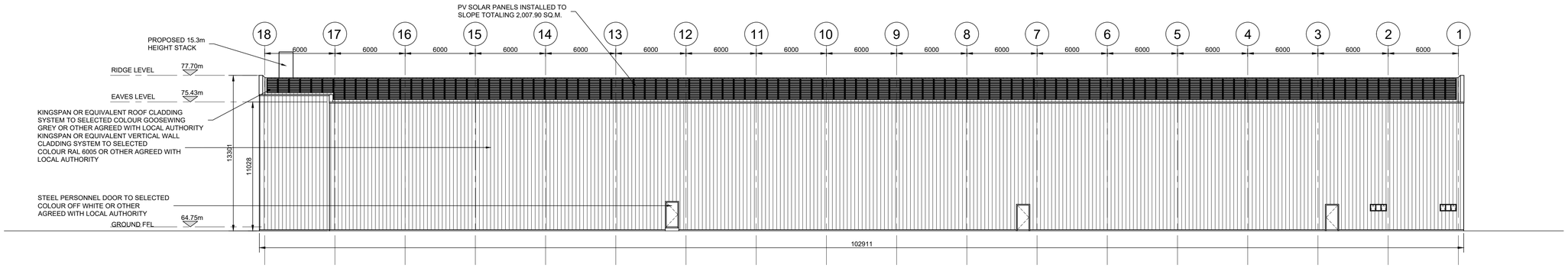
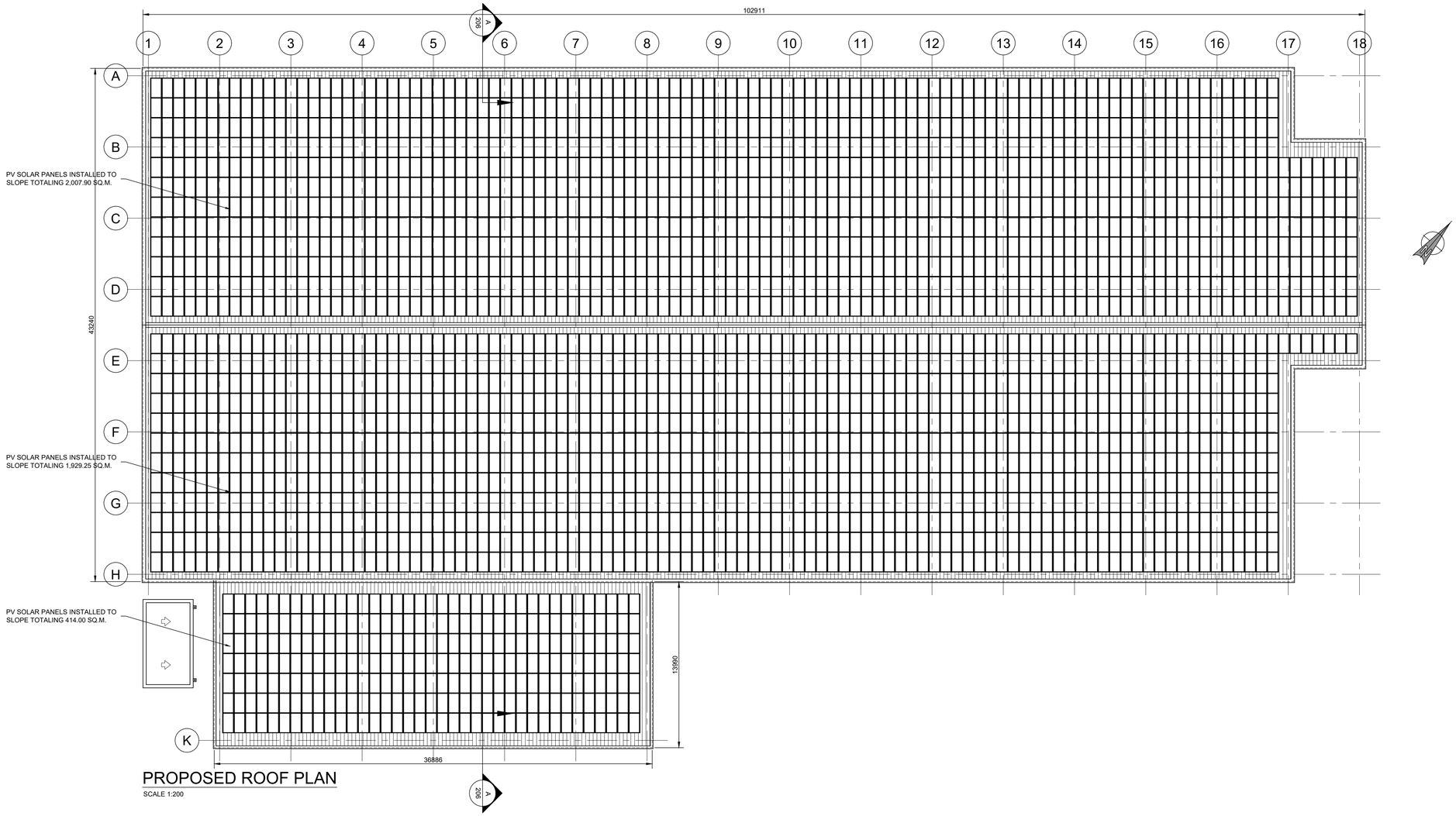
A1



PROPOSED NORTHWEST ELEVATION

SCALE 1:200



PROPOSED ROOF PLAN

SCALE 1:200

INFORMATION

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	10/05/2023	ISSUED FOR COMMENT	CB	CB
P02	12/06/2023	SITE LAYOUT UPDATED	CB	CB
P03	12/07/2023	BUILDING AND SITE LAYOUT UPDATED	CB	CB
P04	28/08/2023	BUILDING LAYOUT UPDATED	CB	CB
P05	02/10/2023	ISSUED FOR COMMENT	CB	CB
P06	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24
TITLE:	PROPOSED ROOF PLAN AND ELEVATION

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
CB	CB	OD	221244	P06
DATE: 01/12/2023	SCALE: 1:200		DRAWING NO: 221244-ORS-Z1-ZZ-DR-AR-205	

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3.9 Waste Acceptance

The incoming materials will be subject to the SEHL documented waste acceptance procedure that requires recording details of the source, type and quantity and the delivery vehicle registration number.

The wastes will be delivered by waste collectors, typically in kerb side waste collection vehicles and rigid body vehicles that have up to date Waste Collection Permits and wastes will not accepted from members of the public. All vehicles will be weighed in at the weighbridge, where accompanying documentation will be checked. The driver will then be directed to the appropriate off-loading area.

Any delivery, which upon inspection at the weighbridge is deemed not to be suitable, will not be accepted. In such event facility personnel will record the name of the haulier, the registration number of the vehicle and the nature and origin of the waste and the vehicle driver will be instructed to return the materials to the producer. Records of all such incidents will be maintained.

The wastes will be off loaded in dedicated reception areas inside the building, where they will be inspected and unsuitable materials removed and brought to a quarantine area. The Black Bin and Brown Bin waste reception areas will be in the northern section of the building, while the dry recyclables and C&D reception and processing areas will be in the southern section of the building. The two areas will be separated by floor to ceiling partition wall.

3.10 Processes

3.10.1 *Waste Treatment*

3.10.1.1 Black Bin Waste

The materials will be processed to separate the recoverables/recyclable from the non-recoverable/recyclable. The processing line will include a bag shredder, trommel, overband magnet, eddy current separator and wind sifters to remove organic fines, ferrous and non-ferrous metals and plastics/paper (lights).

The metals will be sent to authorised metal recycling facilities. The organic fines will be sent to authorised biological treatment facilities (composting and anaerobic digestion plants). The 'lights' will be too contaminated to be recycled but are suitable for the production of solid recovered fuel (SRF) which is used in cement kilns as a replacement for fossil fuels. The residual materials, which contain some putrescible matter, are suitable for use as a refuse derived fuel (RDF) in waste to energy plants. The 'lights' and residual materials will be sent to other SEHL facilities that manufacture SRF and RDF

3.10.1.2 Brown Bin

The Brown Bin waste will be off loaded in dedicated area adjacent to the Black Bin processing area. The waste will not be processed but will be temporarily stored before being bulked up and sent off-site to authorised biological treatment plants.

3.10.1.3 Dry Recyclables

The household mixed dry recyclables undergo manual and mechanical separation into separate recyclable streams (paper, cardboard, plastic, metals). This will include a picking station, optical and ballistic separators, magnets and eddy current separators. The segregated materials will be baled and stored inside the building pending transfer to authorised recycling facilities.

The commercial recyclables will be source separated and will arrive either already baled or loose. The bales will be stored inside the building, pending consignment. The loose materials will be off loaded and then baled, with the bales stored inside the building.

The recovered plastics include high density polyethylene (HDPE), low density polyethylene (LDPE), polyethylene terephthalate (PET) polypropylene (PPE) and polyvinyl chloride (PVC). These will be sent to plastic recycling designed to process the plastics to a point where they can replace virgin polymers in the manufacture of plastic products.

3.10.1.4 C&D Waste

The C&D materials y will comprise mixed and source separated materials (rubble, bricks, tiles, timber metals plastics and soil and stone, and timber). Bulky items and timber will be mechanically removed. The remaining materials will be separated using a mechanical screener, magnets and a picking line and wind sifters. The outputs will include 'lights', metals, timber, soil and stone and rubble. The 'lights' will be used in the manufacture of SRF.

3.10.2 *Plant & Equipment*

Operations will require the use of a range of fixed and mobile plant and an indicative list is shown in Table 3.1.

Table 3.1 Plant and Equipment

Type of Plant	Units
Front Loading Shovel	3
Bag Opener	1
Trommel s	1/2
Baler	2
Air Compressor	1
Shredder	2
Conveyor	2
Magnet	2
Eddy Current Separator	2
Forklift	2
Mechanical Grab	12
Teleporter	1
Yard sweeper	1
Odour Abatement System	1

The final layout of the fixed plant has not yet been determined. All key plant items will have 100% duty and 50% standby capacity. Additional supporting plant items may be hired in for use for short periods, if required to ensure continued site operations. Critical spares will be maintained on-site and a preventative maintenance programme will be implemented.

3.10.3 *Materials Consigned*

All materials consigned from the MRF, with the exception of those that meet End of Waste criteria, will be sent to authorised waste facilities, typically in articulated trailers. All shipments will be weighed on the weighbridge and records of the waste haulier, waste types and quantities and the details of the end destinations will be recorded.

3.11 Services

A detailed description of the water supply, surface water and foul water drainage systems is in the Engineering Planning Report prepared by ORS Consulting Engineers. The Report is in Appendix 3.1 and should be consulted in relation to the detailed design calculations.

3.11.1 *Water Supply*

Water will be obtained from Uisce Eireann water main via a connection at the Ballymount Road Upper. The mains supply will be augmented by rainwater harvesting, with the water used as grey water in the welfare facilities. ORS estimated the water demand for the development in accordance with Irish Water – Code of Practice for Water Infrastructure and this will be 3 .5m^3/day. The new internal water main will be a minimum of 3m from any structure and will incorporate sufficient fire hydrants to ensure that all buildings are within 46m of a hydrant.

3.11.2 *Foul Water*

An internal floor drain and sump will be installed inside the MRF, as shown on Drawing No. 221244-ORS-Z0-00-DR-AR-400. The sump will connect to a new pvc gravity flow foul sewer serving the development. Sanitary wastewater from the welfare facilities will also discharge to the new internal foul sewer. The wastewater from the entire development will fall by gravity and connect into an existing Uisce Eireann 225mm diameter wastewater sewer located on Ballymount Road Upper

ORS estimated volume of wastewater generated from the entire development is in accordance with Irish Water – Code of Practice for Wastewater Infrastructure. This will be approximately 3.5 m^3/day which is equivalent to a Dry Weather Flow of 0.04l/s or Peak Dry Weather Flow (4.5DWF) of 0.18l/s.

3.11.3 *Surface Water Drainage*

The proposed drainage system is shown on Drawing No. 221244-ORS-Z0-00-DR-AR-400. In developing the surface water design for the site ORS reviewed a range of SuDS measures. The measures identified as potentially suitable for controlling the quality and quantity of storm water run-off from the proposed development include:

- Rainwater harvesting;
- Collection of excess roof rainwater and run-off from impermeable surfaces and attenuating it before discharge to outfall locations;
- The use of trapped gullies;
- Permeable paving;
- Soakaways;
- Swale, and
- The use of an oil interceptor.

A1

15m (L) x 5m (W) x 1.5m (Dp.) GEOCELLULAR SOAKAWAY TO BE CONSTRUCTED FOR ROOF RUN-OFF (NORTHERN PITCH). TO PROVIDE 107m³ STORAGE CAPACITY @ 95% VOID RATIO AND INFILTRATION THROUGH SOILS.

SWALE WITH PERFORATED PIPE IN GEOTEXTILE MEMBRANE. AREA 120m². ATTENUATION STORAGE PROVIDE = 25m³

GULLIES TO BE BUNGED IN EVENT OF A FIRE TO PREVENT DISCHARGE TO SWALE AREA

LEAF COLLECTOR

PROPOSED LOCATION OF 10,000L PRECAST CONCRETE RAINWATER HARVESTING TANK AND MH FOR LEAF FILTER. REFER TO M&E SPECIFICATIONS FOR DETAILS OF PUMPS, PUMPED MAIN AND ELECTRICAL REQUIREMENTS. 225mmØ OVERFLOW FROM LEAF COLLECTOR TO S1.06

NON-RETURN VALVE ON OUTLET PIPE FROM RAINWATER HARVESTING TANK TO S1.06

S1.06
CL: 64.350m
IL: 62.052m
SHUT-OFF VALVE TO BE PROVIDED AT MH S1.06 TO BE ACTIVATED IN THE EVENT OF A FIRE

FIN DRAIN OVERFLOW

(S1.06 - 4.890m)
Ø375mm @ 1:305.6

S1.07
CL: 64.350m
IL: 62.036m
FINAL MH TO INCLUDE FLOW CONTROL DEVICE TO LIMIT FLOWS TO GREENFIELD RUN-OFF RATES

FULL RETENTION OIL INTERCEPTOR

NEW MH F1.05 CUT INTO EXISTING LINE
CL:63.500m
IL: 62.163m

MH S1.08 CUT INTO EXISTING LINE
CL: 63.700m
IL: 61.949m

OUTLINE DENOTING EXTENTS OF PERMEABLE PAVING. BUILD-UP TO BE SURROUNDED WITH FIN-DRAINS TO PROVIDE OVERFLOW TO MAIN DRAINAGE NETWORK
830m² AREA, ATTENUATION STORAGE PROVIDED = 60m³

S1.03
CL: 64.350m
IL: 63.142m

F1.04
CL: 64.350m
IL: 62.563m
SHUT-OFF VALVE TO BE PROVIDED AT MH F1.04 TO BE ACTIVATED IN THE EVENT OF A FIRE

S1.05
CL: 64.350m
IL: 62.438m

(S1.05 - 15.000m)
Ø375mm @ 1:949.9

(S1.04 - 54.280m)
Ø375mm @ 1:200.3

(S1.03 - 53.836m)
Ø375mm @ 1:283.1

(S1.07 - 26.599m)
Ø375mm @ 1:271.2

(F1.04 - 30.0m)
Ø150mm @ 1:100

(S1.02 - 42.040m)
Ø225mm @ 1:200

(S1.01 - 45.168m)
Ø225mm @ 1:200

S1.02
CL 64.750m
IL 62.932m

S1.01
CL 65.000m
IL 63.158m

F1.01
CL: 64.750m
IL: 63.641m

(S1.01 - 62.853m)
Ø225mm @ 1:150

(F1.01 - 36.000m)
Ø150mm @ 1:100

F1.02
CL: 64.500m
IL: 63.281m

(F1.02 - 35.471m)
Ø150mm @ 1:100

S1.02
CL: 64.500m
IL: 63.081m

(S1.02 - 14.620m)
Ø300mm @ 1:173.5

S1.03
CL: 64.500m
IL: 62.996m

(S1.03 - 50.140m)
Ø300mm @ 1:174.7

(S2.01 - 52.661m)
Ø300mm @ 1:299.2

(S2.02 - 65.145m)
Ø375mm @ 1:300.3

(S3.01 - 4.254m)
Ø375mm @ 1:298.3

S1.01
CL: 64.600m
IL: 63.500m

S2.01
CL: 64.850m
IL: 62.650m

S2.02
(SUMP MH)
CL: 64.575m
IL: 62.458m

TANK IL: 62.472m

S1.04
CL: 64.300m
IL: 62.709m

S2.03
CL: 64.300m
IL: 62.222m

SUMP FOR RUNOFF COLLECTION

PROPOSED 55m x 22 m x 1.2m Dp. ATTENUATION & FIREWATER RETENTION TANK TO PROVIDE A TOTAL OF 1450m³ STORAGE CAPACITY FOR 100 YEAR STORM EVENT + 20% CLIMATE CHANGE ALLOWANCE / 10 YEAR STORM EVENT + FIREWATER LOADING.

ACO CHANNEL THROUGH YARD AREA

F.F.L. = 64.750m

F.F.L. = 64.500m

F.F.L. = 64.500m

F.F.L. = 64.500m

Ex. 225mmØ FOUL SEWER DRAIN

Ex. 600mmØ SURFACE WATER PIPE

1 CIVIL SERVICES LAYOUT
SCALE: 1:250

GENERAL NOTES

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND SPECIFICATIONS.
2. ALL LEVELS ARE IN METRES TO ORDNANCE DATUM, MALIN HEAD UNLESS NOTED OTHERWISE.
3. THE POSITION OF EXISTING SERVICES AS SHOWN ON THE DRAWING MAY NOT BE ACCURATE. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR LOCATING ALL EXISTING SERVICES ON THE SITE AND SHOULD CONTACT THE RESPECTIVE UTILITY PROVIDERS AND AUTHORITIES FOR THE MOST UP-TO-DATE INFORMATION BEFORE COMMENCING THE WORKS.
4. EXISTING LEVELS ARE INDICATIVE ONLY AND MUST BE CHECKED AND VERIFIED ON SITE PRIOR TO COMMENCEMENT.
5. PROPOSED MANHOLE COVER LEVELS ARE APPROXIMATE AND SHOULD BE ADJUSTED TO SUIT LOCAL FINISHES.
6. ALL SURFACE WATER DRAINAGE INFRASTRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH LOCAL AUTHORITY REQUIREMENTS.
7. LOCKABLE TYPE GULLY TRAPS TO BE USED ON ALL SURFACE WATER DRAINS.
8. GULLY POSITIONS ARE APPROXIMATE ONLY AND SHOULD BE LOCATED AT LOW POINTS.
9. REFER TO ARCHITECTS' DRAWINGS FOR ALL ROOF DRAINAGE, STRIP DRAINS AND GULLY TRAPS BENEATH DOWNPIPES.
10. WHERE IT IS NOT POSSIBLE TO ACHIEVE MINIMUM COVER, PIPES SHOULD BE BEDDED AND SURROUNDED IN CONCRETE 150MM THICK, CLASS E IN ACCORDANCE WITH TII STANDARD CONSTRUCTION DETAIL CC-SCD-00521.
11. ALL WASTEWATER DRAINAGE INFRASTRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER STANDARDS. REFER TO IRISH WATER PUBLICATIONS "WASTEWATER INFRASTRUCTURE STANDARD DETAILS - IW-CDS-5030-01" AND "CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE - IW-CDS-5030-03"
12. HYDRANTS TO BE ACCORDANCE WITH IRISH WATER STANDARD DETAILS STD-W-16 TO STD-W-19.
13. THRUST BLOCK ARRANGEMENTS SHALL COMPLY WITH IRISH WATER STANDARD DETAILS STD-W-28
14. REFER TO MECHANICAL AND ELECTRICAL ENGINEER'S DRAWINGS FOR INTERNAL DRAINAGE AND DETAILS OF SOIL AND VENT PIPES LEADING TO WASTEWATER DRAINAGE AJS.
15. ALL WATER INFRASTRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER STANDARDS. REFER TO IRISH WATER PUBLICATIONS "WATER INFRASTRUCTURE STANDARD DETAILS - IW-CDS-5020-01" AND "CODE OF PRACTICE FOR WATER INFRASTRUCTURE - IW-CDS-5020-03"
16. ALL PLANTING & TREES TO COMPLY WITH SEPERATION DISTANCES AS PER IRISH WATER STANDARD DETAILS FOR WASTEWATER, STD-WW-06 AND STD-WW-06A AND FOR WATER, STD-W-12 AND STD-W-12A
17. A METHOD STATEMENT SHALL BE SUBMITTED FOR APPROVAL PRIOR TO INSTALLATION AND TESTING
18. ALL PIPE DIAMETERS INDICATED ARE INNER DIAMETER.
19. THESE DRAWINGS ARE NOT TO BE USED FOR SETTING OUT PURPOSES. REFER TO ARCHITECTS DRAWINGS FOR SETTING OUT.

CIVIL SERVICES LEGEND

	PROPOSED TWIN WALL SURFACE WATER PIPES
	EXISTING SURFACE WATER PIPES
	PROPOSED PVC FOUL SEWER PIPES
	EXISTING FOUL SEWER PIPES
	PROPOSED RAINWATER HARVESTING PIPES
	EXISTING RAINWATER HARVESTING PIPES
	PROPOSED Ø125mm PE WATERMAIN
	EXISTING WATERMAIN
	BOUNDARY LINE
	PERMEABLE BLOCK PAVING
	DENOTES MINIMUM 6m SEPARATION DISTANCE BETWEEN WATER HYDRANT AND ALL BUILDINGS AND MAXIMUM 46m REACH OF WATER HYDRANTS TO ALL BUILDINGS AS PER IRISH WATER CODE OF PRACTICE
	PROPOSED SURFACE WATER MANHOLE
	PROPOSED FOUL SEWER MANHOLE
	EXISTING MANHOLE
G	GULLY
	FOUL SEWER INSPECTION CHAMBER
	STORM WATER INSPECTION CHAMBER
	WATERMAIN BOUNDARY BOX
	PROPOSED MANIFOLD SUPPLY
	PROPOSED AJ CHAMBER
C.L.	COVER LEVEL
I.L.	INVERT LEVEL
	ANCHOR/THRUST BLOCK
S.V.	SLUICE VALVE
Sc.V.	SCOUR VALVE
HYD.	HYDRANT
DRM	DRY RISING MAIN
A.V.	AIR VALVE
W.M.	WATER METER
DP/MH	DROP MANHOLE

INFORMATION

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
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P02	28/11/2023	RE-ISSUED FOR PLANNING	LH	AK

CLIENT:	BEAUPARK UTILITIES LIMITED
PROJECT:	PROPOSED WASTE PROCESSING FACILITY AT BALLYMOUNT, DUBLIN 24.
TITLE:	PROPOSED CIVILS SERVICES DRAINAGE LAYOUT

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
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It is a standard EPA requirement for all waste management facilities that external operational areas used for waste transport vehicle manoeuvring and parking must be provided with impermeable surfaces to protect soil and groundwater. This restricts the use of permeable paving to car and bicycle parking areas.

ORS estimated that a maximum surface water attenuation storage capacity of 403m^3 is required for the development site. This will be provided by a combination of permeable paving, soakaway, rainwater harvesting tank, swale and, as a last resort, an attenuation tank.

There will be two gravity fall drainage systems serving the building. Run-off from the northern roof pitch will discharge into a geocellualar soakaway at the north-west side of the building that will provide 107m^3 storage and infiltration capacity. Run-off from the southern roof pitch side of the will be directed to a 10,000 litre underground precast concrete rainwater harvesting tank.

Permeable paving (830m^2) in the staff car park will provide 60m^3 of infiltration capacity. The run-off from the central and southern impermeable paved areas will be collected via the system of ACO channels and gullies. These, along with overflow pipes from the permeable paved car parking areas in the west of the site and the harvesting tanks will connect to a 1,450m^3 underground attenuation tank located in the south-east of the site. Run-off in the north of the site will be directed to a swale (250m^2) with a storage and infiltration capacity of 25m^3.

The drainage system is designed to accommodate a 1:100 year rainfall event with a 20% allowance for climate change and also retain firewater run-off in the event of a fire (Refer Section 3.13.5). The attenuation tank will out fall to drain that connects to the Class 1 Full Retention Oil Interceptor. A flow regulator will be installed upstream of the Oil Interceptor to restrict the flow to the Uisce Eireann storm sewer to greenfield rates.

3.11.4 *Power Supply*

Electricity will be obtained from a renewable energy utility provider and an electrical substation will be installed in the south east of the site, due to the increased electricity demand associated with the additional processing capacity. A 500 kw solar panel array will be installed on the building roof. The building will not be over shadowed so the maximum daylight usage will be achieved.

3.11.5 *Lighting*

The lighting scheme will be designed in accordance with the Guidance Note on Bats and Artificial Lighting (GN 08/18 [2018]) published by Institution of Lighting Professionals and Bat Conservation Trust (2018) to minimise the impact external lighting upon faunal populations by retaining dark areas around the external boundaries. The scheme will optimise the lighting configuration to achieve recommended illuminance levels, while minimising light spill through a combination of column location and height, luminaire wattage and optical setting.

3.12 **Materials Storage**

The unprocessed and processed materials will be stored in accordance with a revised Materials and Waste Storage Plan agreed with the EPA.

3.13 Oil

Diesel for the transport vehicles and mobile plant used in the MRF will be stored in the existing bunded oil storage tanks. Hydraulic and lubricating oil used in plant maintenance will be stored on a spill pallet in a designated area inside the MRF.

3.14 Fire Safety Management

3.14.1 *General Prevention Measures*

To prevent/reduce risk of arson the security fence will be maintained around the facility and the entrance gate will be locked in the event of a temporary closure.

Members of the public will not have access to the MRF and only authorised personnel will be permitted inside the buildings. Visitors will be informed of the safety and fire prevention procedures that must be followed while they are on site and there will be a policy of only smoking in designated areas.

Safe systems of work will continue to be provided and service contractors will be obliged to undergo safety inductions before getting access to operational areas. The inductions will address fire procedures, behaviour on site, housekeeping and specific high risk jobs i.e. hot works procedure & permits.

The use of portable electrical heaters will be prohibited and the electrical systems in the building will be subject to regular inspections.

Emergency exit doors will be provided in all of the buildings and fitted with emergency exit signs with back-up lighting.

3.14.2 *Fire Spread*

In the processing building the internal separation distances between materials storage areas/bays will comply with the requirements of the EPA Guidance Note: Fire Safety at Non-Hazardous Waste Transfer Stations, (2013) and the EPA Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, 2016.

3.14.3 *Fire Detection Systems*

An automatic fire detection (for example ceiling mounted heat and smoke detectors) and alarm systems certified to IS 3218 will be installed in the building that will cover all internal areas, supplemented by a manual break glass system. The detection systems will be linked to the fire alarm and will be subject to annual checks by a fire safety contractor.

3.14.4 *Fire Suppression*

Fire extinguishers will be positioned at strategic locations throughout the site and the positions recorded in Fire Register. The extinguishers will be subject to annual inspection and replenishment/replacement as required by a fire safety contractor. The new internal water main will incorporate sufficient fire hydrants to ensure that all buildings are within 46m of a hydrant. Site staff are trained to extinguish small fires with appropriate hand held fire. If staff members cannot tackle a fire safely and effectively, the evacuation of all personnel will be the primary priority.

3.14.5 *Firewater Retention*

An assessment of the storage capacity required to retain firewater run-off generated in a fire was based on the EPA Guidance on Retention Requirements for Firewater Run-Off (2019), which is applicable to all EPA licensed sites.

The volume of firewater generated is determined by the duration of the fire, the amount of suppressants applied during that time, product loss and the occurrence of a 1:10 year 24 hour rainfall event occurring simultaneously with a fire.

The EPA guidance specifies a minimum fire duration of 6 hours and any variation from this must be approved by the Fire Service. The amount of suppressants used is based on the on-site fire water reservoir, mains supply capacity, foam stocks on site, hydrant delivery rate and the fire service pumping capacity from off-site water sources. As a precaution it is assumed that none of the suppressants evaporates.

The 'product loss' generated by applying fire suppressants to the burning solid waste is accounted for in the volume calculated based on the duration of the fire and the suppressant application rates. Therefore the only potential 'product loss' contribution to the firewater is the volume of liquid(s) that could be released from storage tanks and drums damaged in the fire. As a precaution it is assumed that none of the liquids released are combusted.

It is estimated that a retention capacity of 1,567m^3 is required and this will be provided by a combination of storage inside the processing building, the open yards and storm water drainage system, including the 1450m^3 attenuation tank. Automated shut off valves linked to the fire alarm system will be installed on the surface water and foul water drainage systems that will close when the alarm is activated to retain firewater within the site boundary. The gullies connected to the swale in the north-east of the site will be sealed using bungs in the event of a fire.

3.15 **Resource Consumption and Energy Efficiency.**

3.15.1 *Electricity*

The operation of the MRF will be a significant consumer of electricity and the estimated annual usage will be 3MW. Prior to equipment fit out SEHL will engage with equipment suppliers to ensure the optimum energy efficiency of the electrical motors. In the operational stage SEHL will conduct regular energy efficiency audits and implement the recommendations.

The proposed development includes a 500 kilowatt (kw) solar panel installation on the roof of the MRF. The electricity generated will be used directly in site operations.

3.15.2 *Fuel/Oil*

Diesel will be used in the mobile plant and the diesel powered HGVs which will be refuelled on site. It is estimated that the initial annual diesel consumption will be approximately 150,000 litres. This will reduce over time as SEHL expands its compressed natural gas (CNG) fuelled and electrically powered transport fleet. Hydraulic and lubricating oil and grease will be used in plant maintenance and it is estimated that approximately 500 litres will be used annually.

3.16 Safety and Hazard Control

The current Accident Prevention Policy and Safety Statement that make provision for hazard identification and risk assessment will be revised prior to the start of operations. All facility personnel and visitors will be obliged to comply with SEHL's safety guidelines regarding access and on-site traffic movement. All site personnel will be provided with and obliged to wear, personal protective equipment (PPE) appropriate for their particular functions. PPE includes facemasks, gloves, safety glasses, steel-toed footwear, overalls, reflective jackets and helmets.

3.17 Accidents & Emergencies

An emergency is an accident/incident that has the potential to result in environmental pollution and/or harm to human health. The current ERP (Attachment 2.4) will be revised and updated prior to the start of operations and will include instructions on the placement of bungs on the gullies connected to the surface water swale.

3.18 Emissions

Potential and actual emissions associated with the proposed development include, rainwater run-off, sanitary wastewater, noise, odours, dust and vehicle exhausts. Sanitary wastewater and the liquid seeps that collect in the drain in the processing building will discharge to the Uisce Eireann foul sewer. Rain water run-off that is not harvested or infiltrated to ground will discharge to the Uisce Eireann storm water sewer.

The noise sources include the conveyors, extrusion plant, and vehicle loading and movement. Vehicle movements on the yard are potential sources of dust during dry periods. The residual MSW will be a source of odours. Petrol, diesel and compressed natural gas fuelled vehicles will be sources of exhaust gas emissions.

3.19 Emission Controls

The site design and method of operation facilitates the implementation of the following proposed emission controls, which are based on the requirements of the EU Best Available Techniques (BAT) Reference Document for Waste Treatment (2018.).

3.19.1 *Noise*

All materials reception and processing will be carried out inside the processing building. If considered necessary from a Health & Safety perspective acoustic screens will be installed on individual plant items. A noise barrier will be installed along the south-eastern boundary to mitigated noise emissions from vehicle movements at night time. Details of the proposed barrier are shown on Drawing No. 221244-ORS-Z0-00-DR-AR-206.

3.19.2 *Surface Water & Groundwater*

The open yards and building floors will be paved and subject to regular inspection, with damaged areas repaired. All tank and drum storage areas will be impervious to the stored materials. An adequate supply of containment booms and/or suitable absorbent material will be kept on-site to contain and absorb any spillage and staff are trained in the appropriate response actions. There will be a Class 1 Full Retention oil interceptor on the surface water drainage system serving the open yards and the permeable paving in the car parking areas will be designed to filter out oil.

3.19.3 *Air*

3.19.3.1 Dust

All waste processing will located inside the MRF. The paved yards and building floors will be cleaned regularly using a road sweeper and the open yards will be damped down in dry periods.

3.19.3.2 Vehicle Exhausts

The diesel fuelled heavy goods vehicles transporting materials to the facility will be fitted with Selective Catalytic Reduction (SCR) systems. A diesel fuel additive (AdBlue) is used in the SCR to reduce the nitrous oxide levels in the exhaust gases.

3.19.3.3 Odours

Although current operations are not causing off-site odour nuisance, as a precautionary measure due to the proposed increased in the volume of odorous waste accepted, an odour control system will be installed.

The system will comprise a negative air extraction system and an odour control unit (OCU) consisting of a dust filter to remove dusts and a carbon filter to reduce odour levels, will be installed. Prior to the installation of the system the inside of the building will be inspected and a thick foam spray applied to all cladding joints and other parts of the building fabric that could be susceptible to air leaks. Rapid action doors will be fitted to the vehicle access points. The objective is to achieve an air leakage rate of < $2m^3/m^2$/hour.

Air will be drawn from the building using one extraction fan and a system of internal ceiling mounted ducts provided with grills. The fan will have a flow capacity to achieve 2 air changes per hour. The air will pass through a jet pulse dust filter before entering the carbon filter. A damper will be fitted to the inlet of the unit to allow the air flow to be balanced. The treated air will vent to atmosphere via a single stack. The exhaust odour threshold concentration will be less than 1.5 odour units (OUE/m^3).

The proposed design of the odour management system will comply with Best Available Techniques for Waste Management and will submitted to the EPA for its prior approval. The installation will be the subject of a Quality Assurance Plan to ensure it is installed and commissioned in accordance with the approved design parameters.

3.20 **Regulatory Consents**

The current EPA licence (W0039-02) must be reviewed to increase the waste acceptance limit to 350,000 tonnes and authorise the additional processing plant and equipment. The revised EPA licence will specify the operational and infrastructural controls that must be implemented and the emission limit values that must be achieved to ensure that operations do not give rise to environmental pollution or impairment of amenity outside the facility boundary.

The EPA licence will also specify the monitoring that must be carried out to demonstrate compliance with the licence requirements. In addition, the EPA will continue to conduct regulatory compliance inspections and its own independent monitoring.

3.21 Decommissioning

Although the MRF does not have a defined lifetime, the new EPA licence will require the revision of the current Decommissioning Management Plan (DMP). The scope will include the removal of all wastes and hazardous substances, clean out of all tanks and buildings, removal of plant and equipment, including processing lines and the disconnection of service. The DMP will identify the actions that will be taken to ensure that the decommissioning works will not cause environmental pollution and, when complete, ensures the former MRF will not present any significant risk of environmental pollution.

3.22 Construction Stage

3.22.1 *Works Programme*

It is estimated that construction will begin within 6 months of the grant of planning permission and will last for approximately 14 months.

3.22.2 *Construction Compound*

A Construction Compound will be located in the existing car park in the south-west of the site. The compound will include a site office and welfare facilities, hardstanding for plant and machinery and designated waste storage areas. It will be serviced with electrical power and will include portable toilet facilities.

3.22.3 *Site Preparatory Works*

Site preparatory works will be carried out by the Main Contractor and will include:

- Setting of access control to the development areas;
- Provision of secure compound for the storage of all on-site machinery and materials;
- Provision of temporary fencing; and
- Erection of signage.

Prior to the commencement of the works the Main Contractor will check records and drawings to establish the location of existing buried services/utilities. Where it is necessary to disconnect services/utilities during the works for an extended period, temporary alternative provisions will be made.

3.22.4 *Working Hours*

The normal working hours will be 07:00 to 19:00 Monday to Friday (excluding bank holidays) and 08:00 to 14:00 Saturdays. Works will not be carried out on Sundays and Public Holidays. Subject to the agreement of SDCC out of hours activities may be required for certain elements e.g. connections to water mains and foul sewer.

3.22.5 *Plant & Equipment*

Construction materials will be delivered in heavy goods vehicles and concrete mixing trucks. The construction plant items will include tracked excavators, dozers, dump trucks, telescopic handlers, backhoe loaders, lifting platforms, mobile cranes, mobile generators and asphalt paving machines

3.22.6 *Excavation Works*

Once the existing buildings have been demolished the paved areas and subsoils will be excavated to establish formation levels for the new building and roads and for underground services, including the surface water attenuation system.

3.22.7 *Concrete Works*

Concrete batching will take place off site. Excess concrete will be removed from the site and concrete washout will not be permitted. Concrete pouring will be monitored to minimise the risk of significant accidental discharges. Accidental spills will not be hosed down and will be immediately cleaned up.

3.22.8 *Materials – Source and Transportation*

The selection and specification of construction materials will be informed by the local availability of these materials. Subject to the necessary constraints of performance, durability and cost, construction materials will be sourced from local suppliers and manufacturers, where possible.

3.22.9 *Oils and Chemical Storage*

All oils, fuels, paints and other chemicals will be stored in a secure, bunded, hardstand area. The retention capacity of any bulk oil storage tanks will at a minimum be 110% of the tank. For drum storage, a bund capacity of 25% of the maximum volume of material stored is required. Generators will have an integral double contained fuel storage tank. The refuelling and servicing of mobile plant and equipment will only be carried out in the Construction Compound. Spill clean-up equipment and materials will be provided and staff trained in their proper use.

3.22.10 *Surface Water Management*

As there are no surface water courses within or adjacent to the site, specific surface water management measures are not required.

3.22.11 *Groundwater Management*

The construction does not require dewatering. The oil and chemical storage and handling procedures (Section 3.21.9) are designed to minimise the risk to soil and groundwater from accidental spills.

3.22.12 *Traffic Management*

Traffic will include:

- Private vehicles use by construction site staff;
- Construction vehicles (excavators and dump trucks);
- Materials delivery vehicles, typically heavy goods vehicles (HGV).

3.22.13 *Resource and Waste Management Plan*

A Resource and Waste Management Plan (RWMP) has been prepared that describes the measures that will be implemented in the Design Stage and the Construction Stage to' design out' waste, minimise the volumes of waste generated, ensure that the wastes that do arise are managed

appropriately and maximise the recycling/recovery of those materials. A copy of the RWMP is in Appendix 3.3.

3.22.14 *Construction Environmental Management Plan*

A Construction Environmental Management Plan (CEMP) has been prepared that describes the prevention and mitigation measures that will be implemented in the Construction Stage to minimise the risk of adverse environmental impacts, nuisance and impairment of amenity value. A copy of the CEMP is in Appendix 3.4.

3.22.15 *Health and Safety*

As required by the Safety, Health and Welfare at Work (Construction) Regulations 2013, the Main Contractor will prepare a Health and Safety Plan that addresses site specific health and safety issues from the start to the completion of the construction stages.

The Main Contractor will ensure that 'Site Induction' training is provided to all construction staff and ensure all site staff have current 'Safe Pass' cards. All construction staff will receive a full safety briefing and will be provided with all of the safety equipment required for their assigned tasks.

3.22.16 *Site Security*

The Main Contractor will be responsible for site security in the construction stage, including erecting and maintaining adequate fencing.

3.23 **Cumulation**

3.23.1 *Cumulative Projects*

The proposed development will not directly result in any other related project. The materials that will be accepted and processed at the MRF are currently generated at existing off-site residential, commercial, industrial and construction and demolition activities. The only potentially significant cumulative effect linked to these off-site projects are traffic movements, including the delivery of wastes and the consignment of the processed materials

Any secondary projects that may arise due to the existence of the development will occur in the future, for example new recycling plants. All such projects will be the subject of separate planning applications and, depending on the scale, EIA.

Based on the above, the existing and permitted developments that were included in the cumulative assessment are the commercial and industrial activities within 1km of the proposed development site, which are referenced in the relevant Chapters, and the future development of five warehouses/logistics units, three office blocks and a restaurant on a 7.45 ha greenfield site adjoining the north-eastern development site boundary (SD 22A/0099 and SD223A/127).

The assessment also considered the City Edge Project[4] undertaken by SDCC and Dublin City Council (DCC). It is described as a 'transformative initiative' that aims to re-imagine the Naas Road, Ballymount and Park West areas at the western edge of Dublin City. Its overall aim is to create a new urban quarter, with the potential for 40,000 new homes and 75,000 jobs, making it one of the largest regeneration schemes in Europe.

[4] https://cityedge.ie/

4. ALTERNATIVES

4.1 Introduction

This Chapter describes the reasonable alternatives to the proposed development that were considered, including location, layout, design, technologies and mitigation measures. It also describes the 'Do Nothing Scenario'

4.2 Location

Waste management is deemed to be an industrial activity. The Waste Management Plan for Eastern-Midlands Region (2016 -2021) does not identify specific locations for future waste activities, but does state that the proper siting of these activities, including expansion of existing facilities, is the most appropriate method of the planning hierarchy to address the potential for impact on the environment.

In the absence of national guidelines on the siting of waste management facilities SEHL conducted a scoping study of potentially suitable locations in the Greater Dublin Area. The key site selection criteria were:-

- Appropriate land zoning (industrial/general employment);
- Environmental sensitivity;
- A single landholding large enough to allow the provision of the recycling and recovery capacity of 350,000 tonnes/year;
- Availability of a 3 MW electrical supply, and
- Proximity and accessibility to sources of the wastes arising and existing recycling and recovery facilities.

SEHL conducted a search of potentially suitable areas zoned for industrial development in the Greater Dublin Area. However the development of large power intensive data centres has essentially ring fenced electricity supply in a significant portion of the industrial zoned land in the Greater Dublin Area and SEHL could not identify a suitable site.

SEHL then assessed its existing owned and operated waste management facilities in the Greater Dublin Area and adjoining counties. All are located in areas that have the appropriate land use zoning and established use for waste management operations and all have the benefit of planning permission for waste activities. The majority have been specifically designed for the waste management activities currently carried out and are regulated by Industrial Emissions Licences issued by the EPA. The sites included:

- Cappagh Road, Dublin 11
- Millennium Business Park, Dublin 11

- Ballymount Road Upper, Dublin 18
- Greenogue Industrial Estate, Rathcoole, County Dublin
- Fassaroe, County Wicklow
- Beauparc, Slane, County Meath

The Cappagh Road MRF has planning permission to accept 450,000 tonnes of materials annually and SEHL is awaiting a decision from the Bord on an application to increase and annual intake at the Millennium Business Park MRFs to 450,000 tonnes. These annual intake rates are required to meet the future projected growth in waste arising in the facility catchment areas and there is no spare capacity to accommodate additional wastes.

All of the other sites, with the exception of the one in the Greenogue Industrial Estate, are key elements of SEHL's waste management services in their catchment areas and, given their locations, it is not practical to divert wastes to other SEHL facilities while redevelopment works are carried out. The Greenogue facility is located in an area at risk of flooding, which was the grounds for the refusal of a planning application to develop the site as a hazardous waste management facility in 2029 (Ref SD 19A/02344). The flood risk restricts the operational area and prevents the development of the scale of processing building required.

SEHL considers the Ballymount Road Upper facility to be well suited for the expansion of the treatment of waste to maximise recovery and recycling rates for the following reasons:

- The waste recovery activities are compatible with the land zoning and the current land use in the surrounding area;
- The current planning permission and IE licence already authorise the acceptance and processing of wastes;
- Existing ground conditions (soil type/geology/hydrology) and distances from sensitive environmental receptors minimise the risk of unexpected emissions given rise to pollution;
- The site is not being used to its full potential and, according to *inter alia* the National Planning Framework, development should be prioritised on vacant or underutilised brownfield sites instead of on undeveloped greenfield sites that encourage sprawled development;
    - Accessibility: Ballymount Road Upper runs parallel to the M50, with access to the M50 in both directions. The M50 provides ready access to the sources of waste generation in the Greater Dublin Area; access to Dublin Port for the export of recyclables/ recoverables pending the expansion of national capacity. In addition, while the amount of non recoverables/recyclables generated at the MRF will be small (ca 2% of the annual waste intake) the only management option for these materials is landfill. The M50 provides access to the Knockharley Landfill in County Meath via the N2 and the M11/N11 provide access to the Ballynagran Landfill in County Wicklow, and
- Proximity to other SEHL waste management facilities that have the capacity to accommodate the temporary diversion of wastes while the site is being redeveloped.

4.3 Alternative Site Layouts

The evaluation of alternative site layouts was determined by a combination of the site's physical constraints and relevant policy and guidance documents. The constraints were evaluated by the Design Team which included ORS Consultants and SEHL Operational Managers, with inputs from the consultants assessing the potential environmental impacts. Based on the latter the appropriate avoidance, prevention and mitigation measures were incorporated into the design.

The physical constraints were:

- The areas of the site (1.18ha);
- The size of the required processing building to allow all waste handling and storage to be contained inside (minimum 4,500m^2);
- Retain the existing hedgerows around the boundaries;
- Access off the Ballymount Road Upper;
- Private vehicle and bicycle parking and safe internal heavy goods vehicle (HGV) manoeuvrability;
- SuDs design requirements to maximise infiltration to ground and minimise the discharge to the storm sewer, and
- The need to minimise impacts on nearest sensitive receptors.

Due to a combination of the scale of the processing building (4,170m^2) required to handle 350,000 tonnes/year, the structural layout of the existing processing building, the location and size (612m^2) of the existing office and the area of the site (1.18 ha) it was not possible to incorporate any of the existing structures into the redevelopment.

To accommodate access, safe internal vehicle movements and provide the maximum buffer between the waste processing areas and the nearest sensitive receptor (private residence to the east of the site) the processing building was located as close to the northern boundary as possible, while accommodating SuDs measures. Due to the size of the processing building the proposed location is the only practical solution given the physical constraints.

4.3.1 *Green Roof*

At the pre-application meeting SDCC expressed a preference for the provision of a 'Green Roof' in accordance with Policy Objectives G14 Sustainable Drainage Systems and G15 Climate Resilience.

A Green Roof is one planted with different types of vegetation for example grasses, flora, herbs and vegetables. Their benefits include contributing to climate change resilience, helping to improve air quality and temperature while also retaining and filtering stormwater to alleviate pressure on drainage infrastructure. Depending on the mix of plants used, a Green Roof can also contribute to local biodiversity through the provision of biodiversity corridors, as well as providing new public and private amenity spaces.

While SEHL acknowledges the potential benefits associated with a Green Roof, at a site specific level it is not considered appropriate for the proposed development.

A Green Roof is just one of many sustainable drainage options. The proposed surface water drainage system includes a range of alternative sustainable options including rainwater harvesting, permeable paving, swale, soakaways and infiltration trenches and attenuation tanks to maximise infiltration to ground, minimise the discharge to the surface water system maintain flows at greenfield rates and the design has taken cognisance of the need to provide for climate change resilience factors. In this context the sustainable drainage benefits associated with a Green Roof is off-set by the additional costs and carbon emissions linked to the structural works required to support the Green Roof.

In relation to potential biodiversity benefits small patches of isolated habitat in an urban/industrial context, that lack connectivity in the context of the wider landscape, are of limited ecological value. While a Green Roof may provide a degree of visual interest or other environmental benefits in relation to noise and sustainable drainage this does not make it of particular value from an ecological viewpoint.

As a Green Roof on the proposed processing building would be elevated, isolated and exposed it would be of limited value for invertebrates and therefore not expected to be of value for species at higher trophic levels such as birds and bats. It is highly unlikely that it will be colonised by uncommon plant species due to its position and isolation and is likely to be colonised by common and more aggressive herbaceous species or suffer for drying out/destabilisation, if not carefully maintained.

Rooftop conditions are challenging for plant survival and growth. Moisture stress and severe drought, extreme (usually elevated) temperatures, high light intensities, and high wind speeds increase the risk of desiccation and physical damage to vegetation and substrate. In this context the provision of a Green Roof does not provide any meaningful ecological benefit whilst significantly increasing costs and reducing the space available for more meaningful sustainable solutions such as solar panels. There are a number of ecological measures that can be implemented, either within the site or off-site, that would be preferable and have greater potential to increase ecological value.

The proposed waste processing is heavily dependent on the use of electrical equipment such as shredders, conveyors, air handling units, fans and compressors and the estimated annual energy consumption rate will be 3 MW.

SEHL, as part of its Environmental, Social Corporate Governance (ESG) policies have adopted corporate net zero commitments and it is an objective of the current net zero plan to provide 25% of their own electricity through roof mounted solar and achieve net zero across the business by 2040.

Given the current stress on the national electricity grid and the commitments to achieve national greenhouse gas emission reductions SEHL considers that the environmental benefits of the proposed roof mounted solar panels outweighs the sustainable drainage and climate resilience benefits associated with a Green Roof. As such the alternative of a green roof was not advanced.

4.3.2 *Drainage Design*

At the initial design stage of the surface water drainage system. The SuDa measures identified as potentially suitable for controlling the quality and quantity of storm water run-off from the proposed development included:

- Rainwater harvesting;
- Collection of excess roof rainwater and run-off from impermeable surfaces and attenuating it before discharge to outfall locations;
- The use of trapped gullies;

- Permeable paving;
- Soakaways;
- Swale;
- Infiltration trench
- The use of an oil interceptor.

It was estimated that a maximum surface water attenuation storage capacity of 403m^3 was required for the development site. This would be provided by a combination of permeable paving, soakaway, rainwater harvesting tank, swale, infiltration trench and, as a last resort, an attenuation tank, as shown on Drawing No. 221244-ORS-Z0-00-DR-C-400.

There would be two gravity fall drainage systems serving the building. Run-off from the northern roof pitch would discharge into a geocellualar soakaway at the north-west side of the building that would provide a 107m^3 storage and infiltration capacity. Run-off from the southern roof pitch side of the roof would be directed to a 10,000 litre underground precast concrete rainwater harvesting tank.

The run-off from the impermeable paving in the south east of the site would be collected via the system of ACO channels and gullies. These, along with overflow pipes from the permeable paved car parking areas in the west of the site, would connect to a 100mm diameter perforated pipe within a green strip along the south-eastern border of the site. This green strip would act as a swale and provide interception storage and potential for discharge to ground. There would be an overflow from the swale to the drainage system serving the remainder of the yard.

Run-off from the paved area adjacent to the north-eastern boundary would be directed to an infiltration trench that would have an overflow to the drainage system serving the central and eastern yards.

The run-off from the central and eastern yards would be channelled to a 420m^3 underground attenuation tank located in the south-east of the site. This system was designed to accommodate a 1:100 year rainfall event with a 20% allowance for climate change. The tank would out fall to drain that connects to the Class 1 Full Retention Oil Interceptor. A flow regulator would be installed upstream of the Oil Interceptor to restrict the flow to greenfield rates.

An assessment of the noise emissions identified the need for an acoustic barrier along the south-eastern boundary to mitigate the impacts on the residential dwelling. The provision of this barrier precluded the installation of the purposed perforated pipe within a green strip along the south-eastern border of the site.

It is a standard EPA requirement for all licensed waste management facilities that external operational areas used for waste transport vehicle manoeuvring and parking must be provided with impermeable surfaces to protect soil and groundwater. This restricts the use of permeable paving to car and bicycle parking areas. It is also a standard requirement of all EPA licences that provision be made to collect and retain firewater generated in the event of a fire to prevent contamination of off-site watercourses, direct discharge to ground and adverse impacts on off-site wastewater treatment plants. Therefore the drainage system was redesigned, as described in Section 3.10.3 to comply with the EPA requirements.

4.3.3 *Access Design*

In relation to the new site entrance it was an initial design objective to provide a pedestrian refuge island to get the balance right between assisting pedestrians and the operation of the access for HGVs; however an auto tracks assessment determined that a traffic island resulted in encroachment into oncoming lanes and therefore this alternative was not advanced.

4.4 Alternative Technologies

The assessment of technologies that will be applied in the MRF was based on the Best Available Techniques (BAT) Reference Document for Waste Management (European Commission 2018), current proven waste management processing equipment and the need to ensure consistent high quality outputs. An assessment of the proposed operations in the context of the BAT requirements is in Appendix 4.1. As the proposed technologies comply with BAT, consideration of alternatives was not necessary.

4.5 Prevention and Mitigation Measures

The proposed prevention and mitigation measures in relation to emissions to the environment are based on best industry practice the typical structural and operational controls conditioned by the EPA to ensure that licensable activities do not result in environmental pollution, impairment of amenity and adverse human health impacts. Therefore alternative measures were not considered.

4.6 Do Nothing

If the proposed development does not proceed there will be no construction stage, no increase in traffic associated with the current operations, no change to the emissions from the current waste processing activities and no change to the visual impacts. There will be no expansion of waste treatment capacity to meet the projected demands in the Dublin region and no contribution to meeting national recovery and recycling targets and circular economy initiatives. It would also likely result in waste management processes being push further afield outside the Greater Dublin Area increasing trips and emissions and also use of additional land resources.

5. CLIMATE

5.1 Introduction

This Chapter examines the potential effects of the proposed development on climate and the vulnerability of the development to the potential effects of climate change. It identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the effects and assesses the residual potential impacts.

The Chapter was prepared by Dr. Michéal Fogarty and Mr Simon Welchman of Katestone. Mr Fogarty is a Senior Air Quality Consultant with 12 years of experience in Ireland and Australia. He holds a B.Eng, M.Eng and PhD from the UCD College of Engineering and Architecture. He specialises in the areas of air quality and odour impact assessment. Mr Welchman B.Eng has been a director of Katestone since 2004, with more than twenty-three years' experience working as an air quality expert in the private sector and for an environmental regulator.

5.2 Relevant Legislation and Guidance

In addition to the guidance documents listed in Section 1.5 the assessment took into consideration the following:

- European Commission (2019) 2030 Climate & Energy Framework;
- European Commission (2013) The EU Strategy on Adaptation to Climate Change;
- European Commission (2021) Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change;
- European Commission (2018) Revised Energy Performance of Buildings Directive (EPBD) (2018/844/EU);
- United Nations (1992) United Nations Framework Convention on Climate Change;
- United Nations (1997) Kyoto Protocol to the United Nations Framework Convention on Climate Change;
- United Nations (2016) The Paris Agreement 'Accord de Paris'. The United Nations Framework Convention on Climate Change (UNFCCC);
- United Nation (1992) United Nations Framework Convention on Climate Change. First steps to a Safer Future;
- DECC, (2013) National Policy Position on Climate Action and Low Carbon Development (National Policy Position) 2013;

- Department of the Environment, Climate and Communications (2017) National Mitigation Plan;
- Department of the Environment, Climate and Communications (2021) Climate Action Plan 2021 (DECC, 2021);
- Department of the Environment, Climate and Communications (2018) National Adaptation Framework (NAF);
- Department of the Environment, Climate and Communications (2015) Ireland's Transition to a Low Carbon Energy Future 2015-2030;
- Department of Environment, Heritage and Local Government (2016) Climate Action and Low Carbon Development Act 2015, as amended;
- Department of the Environment, Climate and Communications (2021), Climate Action and Low Carbon Development (Amendment) Act 2021 (Act 32 of 2021);
- European Commission (2009a) Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020;
- EPA (2019) Integrating climatic factors into the strategic environmental assessment process in Ireland - A Guidance Note, and
- South Dublin County Council (2019) Climate Change Action Plan 2019 – 2024.

5.3 Methodology

The methodologies used to calculate greenhouse gas (GHG) emissions associated with the proposed development are presented in this section and cover:

- The calculation of GHG emissions at the construction phase of the proposed development;
- The calculation of

  GHG emissions generated in the operational stage

  GHG emissions offset in the operational phase of the proposed development;
- The determination of suitable evaluation criteria.

5.3.1 *Construction Stage*

The predominant sources of GHG emissions will be the manufacturing and transportation of construction materials, construction activities and end of life phase. These are commonly referred to as embodied greenhouse gas emissions and were calculated using:

- Data on the quantities of construction materials that will be used;
- Emission factors derived for construction materials, and

- Data from Walsh and McAuliffe (2020)

The embodied GHG emission for each type of construction material were calculated as the product of:

- The weight or volume of construction material used, and
- The GHG emission factor for that type of material.

The total embodied GHG emissions from the construction stage were calculated as the sum of the embodied GHG emissions for each type of construction material.

Studies have shown that the embodied GHG emissions of construction materials constitute the largest proportion of GHG emissions from the construction stage of development (Walsh and McAuliffe, 2020). The overall GHG emissions from the construction stage were calculated based on:

- The total embodied emissions for the construction stage, and
- The proportion of total greenhouse gas emissions accounted for by embodied emissions

5.3.2 *Quantities of Construction Materials Used*

The construction materials to be used in the following buildings and infrastructure were considered:

- Paved roads
- Carparks
- Yards
- Footpaths
- MRF
- Electrical Substation

Table 5.1 is an overview of the construction materials that will be used.

Table 5.1 Construction Materials: Overview

Construction Material	Value	Unit
Concrete, cement & blockwork	687.5	m^3
Metals - mixed ferrous, aluminium cladding	1,420	Tonnes
Asphalt/Bitumen	685	Tonnes
Aluminium Foil	6	Tonnes
Hard Plastics	2	Tonnes
Glass	18	Tonnes

5.3.2.1 Emission Factors for Construction Materials

The emissions factors are presented in the following Tables.

Table 5.2 Emission Factor for Concrete (including Concrete Blocks)

Parameter	Value	Unit
GWP Portland cement[1]	763	kg CO_2-e/tonne
GHG cement production as a proportion of concrete greenhouse gas emissions[2]	77	%
Concrete emission factor	991	kg CO_2-e/tonne
Density of concrete[3]	2.4	t/m³
Concrete emission factor	413.0	kg CO_2-e/m³
[1] Cement Manufacturers Ireland (2022) [2] Busch (2022) [3] https://civiltoday.com/civil-engineering-materials/concrete/361-density-of-concrete		

Table 5.3 Emission Factor for Steel

Parameter	Value	Unit
GHG emission factor for steel[1]	1.85	tCO_2-e/t_{steel}
[1] World Steel Association (https://www.mckinsey.com/industries/metals-and-mining/our-insights/decarbonization-challenge-for-steel)		

Table 5.4 Emission Factor for Drainage Pipe

Parameter	Value	Unit
Wavin pipes - GHG emission factor[1]	170	kg CO_2-e/tonne
[1] Orbia (2021) Orbia sustainability report		

Table 5. 5 Emission Factor for Glass

Parameter	Value	Unit
Float or coated glass - GHG emission factor[1]	1.323	kg CO_2eq/kg polymer
[1] Emission factor reported in Irish Green Building Council (2022)		

5.3.3 *Walsh & McAuliffe*

Walsh and McAuliffe (2020) completed a life cycle assessment (LCA) of residential buildings in accordance with EN15978 - Sustainability of Construction Works - Assessment of Environmental Performance of Buildings - Calculation Method.

An LCA calculates the total impact a product, service or system has on the environment throughout its whole lifespan. The GHG emissions from the product stage and construction stage include:

- The Product Stage:
  - A1 - Raw material supply
  - A2 - Transport
  - A3 – Manufacturing

- Construction Process Stage
  - A4 - Transport

A5 - Construction installation process

Walsh and McAuliffe calculated that embodied GHG emissions (Stage A1 – A3) in construction materials make up 86% of the GHG emissions associated with residential masonry construction; however they did not determine an equivalent calculation for embodied GHG emissions associated with the construction of industrial buildings.

For the purpose of this assessment of the proposed development it was assumed that embodied GHG emissions will comprise 75% of emissions associated with the construction of industrial buildings. This is a conservative estimate compared to the value determined for residential buildings.

5.3.4 *Operational Stage*

The methodology adopted involved:

- Assessing the MSW and DMR processing in 'Do-Nothing' and 'Do-Something' scenarios
- Assigning a GHG emission factor to MSW for the 'Do-Nothing' and 'Do-Something' scenarios
- Determining the difference in GHG emissions generated from MSW/DMR processing as part of the 'Do-Nothing' and 'Do-Something' scenarios

In the 'Do-Nothing' scenario all the additional MSW/DMR arising would be sent to waste-to-energy facilities in Ireland as:

- There would be no capacity to either handle or process the additional wastes in Dublin and to segregate materials and recover valuable waste streams from the MSW, and
- It is not possible to send MSW directly to landfill, as all landfills require organic waste to be biostabilised before it can be accepted.

In the 'Do-Something' scenario the proposed development will facilitate the handling and processing of additional MSW to produce the following outputs:

- Waste Derived Fuel including
  - SRF
  - RDF
- Separated Organic Fines;
- Separated Metals;
- Separated Glass, and
- Separated Wood.

The SRF will go to cement kilns as a source of fuel. The RDF will be sent to waste-to-energy facilities. The separated organic fines will go to biological treatment facilities for biostabilisation. Separated metals and glass will be sent to dedicated recycling facilities.

A literature review was undertaken to determine suitable emission factors for the waste streams under the 'Do-Nothing' and 'Do-Something' scenarios. GHG emission factors for various types of household waste generated in Ireland were sourced from The Carbon Footprint of Waste (Ireland) (ACRplus, 2021). These factors include emissions associated with the material being:

- Generated
- Recycled
- Incinerated
- Landfilled

The emission factors for incineration were applied to the quantity of each waste category:

- In MSW for the 'Do-Nothing' scenario
- In RDF in the 'Do-Something' scenario
- Recycling factors were applied to the quantity of each category for which recycling is achieved in the 'Do-Something' scenario including:
  - Separated Metals
  - Separated Glass
  - Separated Wood
- Landfilling factors were applied to the quantity of bio-stabilised organic materials produced in the 'Do-Something scenario'.

The emission factors applied to each waste category management techniques, including incineration and recycling, are presented in Table 5.7. These factors were developed by the Zero Waste Scotland's analysis team used insights provided by partners in Ireland alongside default datasets based on the Scottish Carbon Metric and represent life-cycle carbon impact of each waste category (ACRplus, 2021)). A negative value indicates that over the lifecycle of the waste stream the management technique results in reduced carbon emissions.

Table 5.7 Emission Factors

Waste Category	GHG Emission factor (tCO_2-e/t)		
	Incineration	Recycling	Landfilling
Plastics	1.78		
Organic Waste (Food and Garden)	-0.07		0.64
Paper, Card and Beverage Container	-0.32		
Fines	0.22		
Textiles	0.32		
Nappies	0.22		
Metal	-0.74	-4.04	
Glass	0.03	-0.83	
Wood	-0.34	-0.64	
Hazardous waste	0.39	-0.92	

There is no LCA GHG emission factor for bio-stabilised organic wastes in ACRplus (2021). The majority of LCA GHG emissions from landfilled organic wastes is due to the biodegradation of the organic material in landfills resulting in the generation of methane (a potent greenhouse gas).

The proposed development will facilitate the segregation of a large fraction of the organic material from MSW, which will be sent for bio-stabilisation after segregation. The bio-stabilisation of organic waste to the meet the EPA approved biodegradability stability standard means that the organic material landfilled as a result of the proposed development will have virtually no GHG emissions, as the EPA considers it to have a biodegradable factor of zero. The use of the LCA GHG emission factor presented in ACRplus (2021) for landfilled organic waste will therefore be highly conservative.

In the 'Do-Nothing 'scenario it was assumed that all waste categories would be sent for incineration. Recycling emissions factors were identified for the waste categories that would be segregated and recycled as part of the proposed development including:

- Organic waste;
- Metal;
- Glass;
- Wood, and
- Hazardous waste

5.3.5 *Traffic*

The assessment was based on Design Manual for Roads and Bridges (DMRB) (Highways England, 2021), which provides a framework for assessing, mitigating and reporting the effects of motorway and all-purpose trunk road projects on climate.

The impact of a project is initially determined by a scoping assessment that identifies if there is a need to undertake a detailed assessment of the potential effects on climate. The scoping is based on whether, in the operational stage, will roads meet or exceed any of the following criteria:

a) a change of more than 10% in the annual average daily traffic (AADT);

b) a change of more than 10% to the number of heavy goods vehicles; and

c) a change in daily average speed of more than 20 km/hr.

Where the answer to one or more of the scoping questions is 'yes', further assessment must be undertaken and the study area must be consistent with the affected road network (ARN) defined by the proposed development's traffic model.

The Air Quality Spreadsheet issued by the Highways Agency in England provides a tool for the calculation of emissions of carbon dioxide from road transport (Highways Agency, 2021). The latest iteration of the Spreadsheet is Version 8 (Highways Agency, 2021), which incorporates emissions derived from the Emissions Factor Toolkit Version 10.1 (DEFRA, 2020).

5.3.6 *Evaluation Criteria – Climate Change & Policy*

5.3.6.1 Global Climate Change Response

Ireland is a party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, which together provide an international legal framework for addressing climate change. The Doha Amendment to the Kyoto Protocol was adopted at COP 18 in December 2012 and came into force in December 2020. Parties, to the Doha Amendment, including the European Union, committed to reduce GHG emissions by at least 18% below 1990 levels in the eight-year period from 2013 to 2020.

Each EU Member State committed to differing emission reduction targets in the EU's so-called effort-sharing decision of 2009. Ireland's GHG emissions reduction commitments under the EU's effort sharing decision is to reach 20% below 2005 levels over the 2013 to 2020 period, with annual targets within the period of the Doha Amendment.

The Paris Agreement is the most recent legally binding, global agreement addressing climate change under the UNFCCC. It has a stated aim of limiting global temperature increases to no more than 2°C above pre-industrial levels, with a commitment to pursue efforts to limit this rise to 1.5°C. The

Agreement was adopted by 195 Parties to the UNFCCC, representing 95% of global emissions, at the twenty-first session of the Conference of the Parties (COP 21) to the UNFCCC in December 2015.

The ratification of the Agreement by the EU triggered its entry into force on 4 November 2016, the same date the Agreement was ratified by Ireland. This legally binding agreement represents a global milestone in international efforts to achieve a peaking of greenhouse gas emissions as soon as possible and to achieve net zero emissions by the second half of the century.

Each Member State must commit to a Nationally Determined Contribution (NDC) that shall increase in ambition over time, with progress being tracked by a series of global stocktakes, to be held every five years, starting in 2023. Ireland's contribution to the Paris Agreement will be via the NDC tabled by the EU on behalf of its Member States. The EU has committed to reducing its GHG emissions by at least 40% by 2030, compared to 1990 levels.

5.3.6.2 EU Response

The European Green Deal Communication launched a new growth strategy for the EU that aims to transform the EU into a fair and prosperous society, improving the quality of life of current and future generations, with a modern, resource-efficient and competitive economy where there are no net GHG emissions in 2050 and where economic growth is decoupled from resource use. The European Green Deal reaffirms the Commission's ambition to make Europe the first climate-neutral continent by 2050.

The European Climate Law enshrines the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The Law also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. The Law entered into force in July 2021.

The Commission has a range of strategies and targets to reduce emissions of GHG including:

- 2020 climate & energy package;
- 2030 climate & energy framework, and
- 2050 long-term strategy

The 2030 climate and energy framework includes EU-wide targets and policy objectives for the period from 2021 to 2030.

The *Effort Sharing Regulation*[5] establishes binding greenhouse gas emission targets for Member States, stipulating emissions targets for the periods 2013-2020 and 2021-2030 that are required to fulfil the EU's commitments under the Paris Agreement. It also details the rules on determining annual emission allocations and for the evaluation of national progress towards meeting minimum contributions.

The Effort Sharing Regulation aims for emissions reduction targets include:

- 43% in the EU emissions trading system ('EU ETS') laid down in Directive 2003/87/EC of the European Parliament and of the Council by 2030 compared to 1990 levels;
- 30 % in the non-ETS sectors by 2030 compared to 1990 levels, and
- 80-95 % by 2050 compared to 1990 levels

[5] Regulation (EU) 2018/842 - Binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013

Overall, the EU has adopted an interim objective for a reduction in GHG emissions of 40% by 2030. This objective will be achieved through a combination of the EU Emissions Trading Scheme (ETS) and individual targets for each EU Member State for non-ETS sectors. Complementary to this, the Commission's Climate and Energy Framework includes targets of 32% renewable energy and an energy efficiency improvement of at least 32.5% across the EU by 2030.

The final agreement sets a target of 30% reduction in GHG emissions (compared to 2005 levels) by 2030 for Ireland. This will be Ireland's contribution to the overall EU objective to reduce its emissions by 40% by 2030 compared to 1990 levels.

In July 2020, a draft law[6] to amend *the Effort Sharing Regulation* was tabled by the Commission. Its aim was to assign strengthened emission reduction targets to each Member State for buildings, road and domestic maritime transport, agriculture, waste and small industries. These targets recognise the different starting points and capacities of each country. The update reflects the increased ambition enshrined in the European Climate Law.

5.3.6.3 National Policy & Long Term Vision

In 2014, the Government adopted the National Policy Position on Climate Action and Low Carbon Development (National Policy Position). The National Policy Position establishes the fundamental objective of achieving the transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. It sets out the context for the objective, clarifies the level of GHG mitigation ambition envisaged and establishes the process to pursue and achieve the overall objective. Specifically, the National Policy Position envisages that policy development will be guided by a long-term vision based on:

- An aggregate reduction in carbon dioxide (CO_2) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors, and

- In parallel, an approach to carbon neutrality in the agriculture and land-use sector, including forestry, which does not compromise capacity for sustainable food production.

With 2015 GHG emissions as a starting point this equates to average annual reductions of 0.75$MtCO_2$, compared to the projected position in 2035, which would require average annual reductions of almost 2 $MtCO_2$ and highlights the need for earlier action.

The White Paper on Energy Policy, *Ireland's Transition to a Low Carbon Energy Future 2015-2030* recognises that a radical transformation of Ireland's energy system is required to meet national, EU and international climate objectives and sets a course for an energy sector where the State will provide the supports that enable consumers to become active energy citizens.

The aim is to reduce GHG emissions from the energy sector by between 80% and 95% compared to 1990 levels by 2050, while ensuring secure supplies of competitive and affordable energy remain available to citizens and businesses. The White Paper sets out how the energy transition will depend on accelerated and diversified renewable energy generation and a renewed focus on energy efficiency.

The *Climate Action and Low Carbon Development Act 2015* provides the statutory basis for the national transition objective – the goal of progressively pursuing a low carbon, climate resilient and

[6] Proposal for a Regulation amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement. https://opac.oireachtas.ie/Data/Library3/Documents%20Laid/2021/pdf/DECCdocslaid270821a_270821_162547.pdf

environmentally sustainable economy by 2050. It also provides the legislative framework for the development and submission to Government for approval of national mitigation plans and national adaptation frameworks. This includes the institutional and governance framework for the development of these plans, together with independent advisory and Oireachtas accountability arrangements.

The Climate Action and Low Carbon Development (Amendment) Act 2021 provides the legally binding path to net-Zero emissions no later than 2050 and to a 51% reduction in emissions (compared to 2018 levels) by 2030. Ireland's statutory national climate objective and 2030 targets are aligned with Ireland's obligations under the Paris Agreement and with the EU's objective to reduce GHG emissions by at least 55% by 2030, compared to 1990 levels and to achieve climate neutrality in the EU by 2050 (DECC, 2021).

In July 2022 Ireland adopted sectoral emission ceilings to achieve the targets of the Climate Action and Low Carbon Development (Amendment) Act 2021. The ceilings include:

- A 50% reduction in GHG emissions from transport by 2030.
- A 45% reduction in GHG emissions from buildings (commercial and public) by 2030

At a national level, Ireland adopted the Climate Action Plan 2023 (CAP 2023), which was published in December 2022 (DECC, 2022). CAP 2023 is the first Climate Action Plan to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021. It sets out the measures to be taken to reach Ireland's targets in each sector of the economy, compliments the National Policy position and includes provisions for the management of GHG emissions at a national level, including a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting Ireland on a path to reach net-zero emissions by no later than 2050.

5.4 Development Description

Chapter 3 includes a detailed description of the existing site and the proposed developments. The aspects relevant to Climate are:

- Impacts in the construction stage due to:

  The generation of GHG emissions from construction activities;

  The GHG emissions generated as part of the manufacture of construction materials (embodied emissions), and

  Additional traffic associated with the construction works.

- Impacts in the operational stage due to:

  The generation of GHG emissions associated with

  Traffic;

  The energy required for on-site operational activities;

  The bio-stabilisation and landfilling of segregated organic material (Irish landfills are not authorised to accept MSW residue unless bio-stabilised)

The combustion of other waste streams in:
- Municipal waste incinerators, and
- Cement kilns;

- The offset of GHG emissions from the recycling of metal, glass and batteries instead of combustion in a waste-to-energy facility, and

- Impacts by the potential effects of climate change.

GHG emissions that are directly associated with the operational stage are linked to the traffic and energy requirements. The generation and offset of indirect GHG emissions may not occur at the site; however without the proposed development to facilitate the processing of certain waste streams, GHG emission offsets would not be realised at downstream waste management facilities.

The 'brown bin' waste will be unloaded from collection trucks and transferred to bulk transport vehicles for off-site removal. The DMR will be unloaded from collection trucks, sorted, and transferred to bulk transport vehicles for offsite removal. GHG emissions from this activity are associated with transportation and handling of brown bin waste and DMR. The transfer of material from collection trucks to bulk transport vehicles will result in a more efficient long distance haulage, which offsets GHG emissions compared to the 'Do-Nothing' scenario that would require long distance haulage in collection trucks.

The processing and segregation of MSW will result in indirect GHG emission generation and offsets that would not occur if the proposed development did not proceed. GHG emission offsets will occur due to:

- The segregation and bio stabilisation of the organic component of MSW, and

- The removal of recyclable components from MSW that would otherwise be included in materials sent for incineration in waste to energy facilities

GHG emissions associated with the construction and operational stages will contribute to climate change. GHG emissions offsets in the operational stage will negate the potential effects that would occur from the GHG emissions generated if the proposed development does not proceed.

5.5 Receiving Environment

5.5.1 *GHG Emissions*

Ireland's Final Greenhouse Gas Emissions 1990-2020 (EPA, 2022) presents a detailed summary of national emissions for 2020, together with an overview of national emissions from 1990 until 2020. Ireland's national GHG emissions for 2020 were estimated to be 57,716 ktCO2-e (excluding Land Use, Land-use Change and Forestry or LULUCF), with 9,703 $ktCO_2$-e (16.8%) attributable to road transport emissions as a sector.

The EPA published a report entitled *Ireland's Greenhouse Gas Emissions Projections 2022-2041* in 2023 (EPA, 2023b). This report provides an assessment of Ireland's total projected greenhouse gas emissions from 2021 to 2041. The report also assesses Ireland's progress towards achieving its emission reduction targets for 2020 and 2030 as set out under the EU Effort Sharing Decision (ESD)[7] and *Effort Sharing Regulation*. Ireland's Greenhouse Gas Emissions Projections 2021-2040 is presented in spreadsheet form in EPA (2023b).

[7] Decision No 406/2009/EC of 23 April 2009 (EC, 2009)

Ireland's existing long term National Policy Position on Climate Action and Low Carbon Development (DECC, 2013) sets out a low-carbon road map process that will be guided by a long-term low-carbon transition. Key findings include:

- Ireland is not on track to meet the 51 per cent emissions reduction target (by 2030 compared to 2018) based on these projections which include most 2023 Climate Action Plan measures. Further measures still need to be identified and implemented to achieve this goal.

- Ireland can meet its original EU Effort Sharing Regulation target of a 30 per cent emission reduction by 2030 (compared to 2005) if all measures and flexibilities, including the LULUCF flexibility, are used. Reaching the new 42% EU emission reduction target will require full and rapid implementation of the Climate Action Plan 2023 Existing Measures and Additional Measures. Emissions in the Additional Measures scenario are projected to be 29% lower in 2030 (compared with 2018), whereas in the Existing Measures scenario the emissions reduction is projected to be 11%. Faster implementation of the Measures are required to meet both National and EU targets.

In relation to Waste the report states:

- The Industrial Processes and Waste sectors contributed 4% and 2% of Ireland's total emissions in 2021 respectively. There is only one scenario (With Existing Measures) for greenhouse gas emissions projections from these sectors based on available data.

- Waste sector emissions are projected to decrease by 18% between 2021 and 2030 from 0.9 to 0.8 Mt CO2 eq. The waste sector includes landfill, incineration and open burning of waste, mechanical and biological treatment and wastewater treatment. missions are primarily attributable to methane emissions from landfill which reduce over the projected period in line with the projected reduction in waste going to landfill and the age of the waste already there. The amount of landfill gas flared and utilised for energy production is 58% in 2021 and is projected to decrease to 51% in 2030 and 40% by 2050 in line with more recent trends in the latest inventory. Ireland's landfill rate for municipal waste dropped to 16% in 2020, reflecting a steep decline from 58% in 2010 and is on track to comply with the Landfill Directive target of less than 10% of Municipal waste landfilled by 2035.

In addition to defining legally binding emission reduction commitments, the Climate Action and Low Carbon Development (Amendment) Act (DECC, 2021) will support Ireland's transition to net-zero and the achievement of a climate neutral economy no later than 2050. It also establishes a legally binding framework with clear targets and commitments, to ensure the necessary structures and processes are in place to deliver our national, EU and international climate goals and obligations in the near and long term.

In light of the increase in ambition under the Climate Action Plan, significant additional measures must be undertaken across the whole of Irish society and across the economy to achieve the level of change required to meet the 2030 target. The Climate Action Plan also assumes full implementation of the 2019 plan. In the medium term, Ireland is still projected to meet its 2030 target under the Climate Action and Low Carbon Development (Amendment) Act.

The binding annual greenhouse gas emission target for Ireland under the EU Effort Sharing Regulation (ESR) EU/2018/842 for non-ETS sectors is a reduction of 30% in emissions by 2030 compared to 2005 levels. This target will be amended following the European Council's decision to increase ambition from its existing EU-wide 2030 target of a 40% reduction to at least 55%, compared to 1990 levels. Annual greenhouse gas emissions for non-ETS sectors were 47,869 Mt CO_2 eq in 2005 (SEAI, 2021).

Ireland's obligation under the ESR Ireland's greenhouse gas emission target for non-ETS sections is 33,508 kt CO_2 eq in 2030.

The binding annual GHG emission target for Ireland under the Climate Action and Low Carbon Development (Amendment) Act is a reduction of 51% in emissions by 2030 compared to 2018 levels. Annual GHG emissions for Ireland were 60,242 kt CO_2 eq in 2018 (comprising 13,441 kt CO_2 eq of ETS emissions and 46,801 kt CO_2 eq of non-ETS emissions). According to Ireland's obligation under the Climate Action and Low Carbon Development (Amendment) Act, Ireland's GHG emission target is 29,886 kt CO_2 eq in 2030.

The baseline GHG emissions for the assessment were taken from EPA (2023a) and are presented in Table 5.8. The data reported in 2022, with additional measures, *"includes all policies and measures included in the WEM scenario, plus those included in government plans but not yet implemented. For example, the WAM scenario includes the target of 944,600 Electric Vehicles on the road by 2030 in the Climate Action Plan 2021. The full amount of this ambition is not currently in the existing measures scenario as actions still remain to be taken that would deliver it."* (EPA, 2023b)

Table 5-8 Baseline GHG Emissions

Projected GHG emissions	Year	non-ETS emissions (kt CO_2 eq.)	Total emissions (kt CO_2 eq.)
Projected GHG emissions (with existing measures)	2025	41,888	57,996
Projected GHG emissions (with additional measures)	2025	39,222	54,505
Projected GHG emissions (with existing measures)	2040	35,634	47,880
Projected GHG emissions (with additional measures)	2040	25,182	34,731

5.5.2 *Climate Vulnerability*

In addition to the potential impact of the proposed development on climate change as a result of GHG emissions, the potential vulnerability of the proposed development to the impacts of climate change is considered in this chapter.

The baseline climate of the receiving environment is described in Section 9.4 of Chapter 9 – Air Quality. The assessment of climatic hazards in the South Dublin County Council Climate Adaptation Strategy (2023) identifies the following main climatic categories:

- Increased frequency and intensity of:
  - Extreme rainfall
  - Wind storms
  - Heat waves
  - Dry spells
  - Cold spells
  - Heavy Snowfalls
- Changes to:
  - River flooding
  - Pluvial flooding
  - Changes to ground water levels
  - Coastal flooding and erosion

The greatest risk of climate change to the proposed development is from extreme weather events that could adversely impact on operations. The site is not in a flood risk zone so additional risk of flooding associated with climate change in the region is not likely to affect the proposed development

5.6 Impacts

5.6.1 *Construction Stage*

GHG emissions from the construction stage include embodied emissions and construction activities. The embodied emissions are presented in Table 5-9. The emissions during the construction stage are listed in Table 5-10. The GHG emissions from the construction phase as a proportion of projected non-ETS GHG emissions in Ireland in 2024 are presented in Table 5.11.

Table 5-9 Embodied GHG Emissions

Construction Material	Value	Unit
Concrete, cement & blockwork	284.0	tCO2-e
Metals - mixed ferrous	2627	tCO2-e
Asphalt/Bitumen	320.9	tCO2-e
Aluminium Foil	40.7	tCO2-e
Hard Plastics	0.3	tCO2-e
Glass	23.8	tCO2-e
Total embodied GHG emissions	3,296.7	tCO2-e
Total embodied GHG emissions	3.3	KtCO2-e

Table 5-10 Construction Stage Emissions

Parameter	Value	Unit
Embodied GHG emissions as a percentage of total construction GHG emissions	75%	
Calculated GHG emissions from the construction phase of the proposed development	4.6	tCO_2-e

Table 5-11 GHG Emissions as a Proportion of Projected non-ETS GHG Emissions in Ireland in 2024

Parameter	Value	Units
Total GHG emissions from the construction phase of the proposed development	4.4	kt CO_2e
Projected non-ETS GHG emissions (with existing measures) - 2024	41,888	kt CO_2e
Projected non-ETS GHG emissions (with additional measures) - 2024	39,222	kt CO_2e
Construction phase contribution to projected non-ETS GHG emissions (with existing measures) - 2024	0.010%	%
Construction phase contribution to projected non-ETS GHG emission (with additional measures) - 2024	0.011%	%

The GHG emissions associated with the construction stage are conservatively estimated to be 0.011% of non-ETS GHG emissions (if existing measures are applied to GHG reduction) in 2024 and 0.011 of non-ETS GHG emissions (if additional measures are applied to GHG reduction) in 2024. The emissions

from the construction stage, in the context of non-ETS GHG emissions, are considered negative, slight and long-term.

5.6.2 *Operational Stage*

The operational stage will result in GHG emissions predominantly due to the additional traffic, along with emissions resulting from the operation of the MRF and the FCCP.

5.6.2.1 Traffic

Traffic data was obtained from Systra to determine the potential for air quality impacts in the operational stage under the 'Do-Something 'scenario. Traffic data was provided for the following road links:

- Turnpike Road
- Ballymount Rd Lower north of Ballymount Road Upper
- Ballymount Rd Lower south of Ballymount Road Upper
- Ballymount Rd Upper between Ballymount Road Lower and Panda
- Ballymount Rd Upper between Panda and Calmount Rd
- Calmount Rd north of Ballymount Road Upper
- Ballymount Road Upper east of Calmount Road
- Calmount Rd south of Ballymount Road Upper

The scoping assessment methodology described in Highways England (2021) was used to determine if further assessment was required. There will be no changes in speed band on the roads in the ARN due to the proposed development. The total volume of traffic generated as a result of the proposed development on any road link is less than the scoping criteria for:

- Average Annual Daily Traffic (AADT) >=1,000, and

- HDV AADT of >=200

Considering that there will be no changes in speed band or carriageway alignment by >=5m, the scoping assessment indicates that no further assessment is required to demonstrate that traffic in the operational stage will result in GHG emissions at significant levels. Therefore the potential impact of GHG emissions on climate associated with the traffic was not considered further.

The CO_2 emissions on the single road link that triggers the traffic scoping criteria and adjoining roads on the ARN described in Section 9.5.3.1 of the Air quality chapter of this EIAR. were calculated using the the air quality spreadsheet issued by the Highways Agency in England (Highways Agency, 2021).

The CO_2 emissions are a function of the increase in AADT and the length of the road link on the ARN. The change in CO_2 emissions due traffic from the proposed development in the opening year and the design year are presented in Table 5-12.

The quantity of operational GHG emissions from the proposed development were estimated and found to be insignificant in the opening year and the design year in the context of Ireland's projected non-ETS emissions for the opening and design years. The potential impact of the operational phase of the proposed develop on climate is found to be negative, imperceptible and long-term.

Table 5-12 Increase in CO_2 Emissions From Traffic

Road	Increase in CO_2 emissions due to traffic from the proposed development	
	Tn/Year - CO_2	
	Opening Year 2025 (Phase 1)	Design Year 2040 (Phase 2)
Ballymount Rd Upper between BRL and Panda	2.0	1.8
Ballymount Rd Upper between Panda and Calmount Rd	48.5	48.9
BRU east of Calmount Rd	0	0.5
Calmount Rd north of BRU	-1.2	-1.1
Calmount Rd south of BRU	1.7	1.4
Total	**50.9**	**51.5**
Projected non-ETS GHG emissions (with additional measures)[1]	39,222	25,182
GHG emissions from the proposed development as a percentage of ESR binding Target (2030)	0.0001%	0.0002%
[1] From EPA (2023b) Ireland's Greenhouse Gas Emissions Projections. 2022 - 2040		

5.6.2.2 MRF

Currently the SEHL facility accepts up to 150,000 tonnes/annum of household and construction and demolition waste. The proposed development will accept an additional 200,000 tonnes of materials per annum of which 160,000 tonnes will be household waste and, commercial waste of a similar composition to household waste, and 40,000 tonnes will be construction and demolition waste. The national waste statistics (EPA, 2023d) indicate that household waste streams comprise:

- 59.7% general (black bin) waste
- 22.5 DMR (recycling bin) waste
- 17.8% brown bin waste

Adopting these percentages to the additional 160,000 tonnes/annum of household waste material received at the MRF indicates that the waste received will comprise:

- 59.7% general (black bin) waste or 95,507 tonnes per annum
- 22.5 DMR (recycling bin) waste or 36,014 tonnes per annum
- 17.8% brown bin waste or 28,479 tonnes per annum

The percentage and quantity of additional black bin waste streams accepted at the proposed development are presented in Table 5-13**.** The percentage and quantity of additional recycle bin waste streams (DMR) accepted at the proposed development are presented in Table 5-14

A recent EPA study indicates that currently a fraction of DMR materials are fully recycled (EPA, 2023d). The remaining materials that are not recycled are processed by methods such as incineration for energy recovery, bio stabilisation and landfilling and processing of hazardous waste in dedicated facilities (EPA, 2023d). For the purpose of this study the proportion of DMR materials that are recycled and processed using alternative methods is presented in Table 5-15. The corresponding quantities of materials that are recycled and processed using alternative methods is presented in Table 5-16**.**

Table 5.13 Black Bin Waste Composition

Waste stream	Proportion of MSW (%)	Quantity (t/annum)
Plastics	16.9%	19,724
Organic Waste (Food and Garden)	21.1%	16,610
Paper, Card and Beverage Container	11.6%	15,572
Fines	8.2%	11,419
Textiles	8.8%	10,381
Nappies	10.4%	10,381
Glass	3.0%	4,879
Metal	4.1%	3,322
Wood	1.0%	1,142
Hazardous waste	2.0%	2,076

Table 5.14 DMR Composition

Waste stream	Proportion of MSW (%)	Quantity (t/annum)
Plastics	21.3%	7,683
Organic Waste (Food and Garden)	3.1%	1,128
Paper, Card and Beverage Container	48.7%	17,526
Fines	2.7%	979
Textiles	2.5%	898
Nappies	0.9%	327
Metal	2.1%	769
Glass	5.9%	2,111
Wood	0.4%	157
Hazardous waste	0.8%	288

Table 5.15 DMR Recycling & Processing Rates

Waste stream	Proportion Recycled	Proportion Incinerated/Landfilled/further Processed
Plastics	28%	72%
Organic Waste (Food and Garden)	0%	100%
Paper, Card and Beverage Container	73%	27%
Fines	0%	100%
Textiles	19%	81%
Nappies	0%	100%
Metal	74%	26%
Glass	84%	16%
Wood	51%	49%
Hazardous waste	0%	100%

Table 5.16 Quantities of Materials Recycled and Processed

Waste stream	Quantity Recycled	Quantity Incinerated/Landfilled/further Processed
Plastics	2,151	5,532
Organic Waste (Food and Garden)	0	1,128
Paper, Card and Beverage Container	12,794	4,732
Fines	0	979
Textiles	171	728
Nappies	0	327
Metal	569	200
Glass	1,773	338
Wood	80	77
Hazardous waste	0	288

In the Do-Nothing scenario it was assumed that, as there is no waste management processing capacity that the additional material received as a result of the proposed development would be sent directly for energy recovery by incineration without material segregation.

In the Do-Something scenario it was assumed that the proposed development would facilitate the segregation of MSW and DMR from recycle bin waste as follows:

- MSW:
  - Segregated materials used to derive refuse derived fuels:
    - Plastics
    - Paper Card and beverage containers
    - Fines
    - Textiles
    - Nappies
  - Segregated materials that can be recycled
    - Metal
    - Glass
    - Wood
    - Hazardous waste
  - Segregated organics to be sent for biostabilisation before being landfilled.

- DMR:
  - Segregated materials that will be recycled or that will be used to derive RDF (proportions calculated based on EPA packaging statistics):
    - Plastics
    - Paper Card and beverage containers
    - Fines
    - Textiles
    - Nappies
    - Metal
    - Glass
    - Wood
    - Hazardous waste
  - Segregated organics to be sent for biostabilisation before being landfilled

The GHG emissions calculated for the Do-Nothing scenario for the handling and processing of additional MSW and DMR are presented in **Error! Reference source not found.**17.

Table 5.17 Do Nothing Scenario

Waste Category	MSW	DMR - Recycled	DMR - not Recycled
	GHG Emissions (tCO_2-e/t)		
Plastics	32,983	3,829	9,847
Organic Waste (Food and Garden)	-1,620	0	-79
Paper, Card and Beverage Container	-4,077	-4,094	-1,514
Fines	1,983	0	215
Textiles	3,089	55	233
Nappies	2,510	0	72
Metal	-3,419	-421	-148
Glass	94	53	10
Wood	-368	-27	-26
Hazardous waste	846	0	112
Net GHG emissions (negative means an offset)	32,024	-605	8,722
Overall GHG emissions - do nothing	**40,140**		

The GHG emissions calculated for the do-something scenario for the handling and processing of additional MSW and DMR are presented in Table 5-18.

Table 5.18 Do Something Scenario

Waste Category	MSW	DMR - Recycled	DMR - not Recycled
	GHG Emissions (tCO_2-e/t)		
Plastics	32,983	-559	9,847
Organic Waste (Food and Garden)	14,809	0	722
Paper, Card and Beverage Container	-4,077	-256	-1,514
Fines	1,983	0	215
Textiles	3,089	-1,011	233
Nappies	2,510	0	72
Metal	-18,664	-2,300	-808
Glass	-2,611	-1,472	-280
Wood	-692	-51	-49
Hazardous waste	-1,997	0	-265
Net GHG emissions (negative means an offset)	27,334	-5,649	8,173
Overall GHG emissions - do nothing	**29,858**		

The difference in GHG emissions between the Do-Nothing scenario and the Do-Something scenario is presented in Table 5-29. A negative value indicates a net reduction in GHG emissions due to the processing of material in the do-nothing scenario

Table 5-29 Difference Between Do Nothing and Do Something Scenarios

GHG Emissions	GHG Emissions (tCO_2-e/t)
Overall GHG emissions - do nothing	40,140
Overall GHG emissions - do something	29,858
Net gain/offset in emissions from the proposed development	-10,282

The operation of the MRF will result in a GHG emissions reduction of -10,282 tCO_2e/annum compared to the Do Nothing scenario.

5.6.2.3 Summary

The GHG emissions from the proposed development as a percentage of projected non-ETS emissions in Ireland are presented in Table 5-30**.** The results show that the proposed development will result in a net positive impact on GHG emissions in Ireland in the opening and design years.

Table 5-30 GHG Emissions as a % of Projected NTS Emissions In Ireland

Parameter	Opening Year	Design Year
	kt/Year - CO_2e	
Operational Emissions (NET)	-10.3	-10.3
Projected non-ETS GHG emissions (with additional measures)[1]	39,222	25,182
GHG emissions from the proposed development as a percentage of projected non-ETS emissions (with additional measures)	-0.03%	-0.04%
[1] From EPA (2023) Ireland's Greenhouse Gas Emissions Projections. 2022 - 2040		

The quantity of operational GHG emissions will be insignificant and positive in the opening year and the design year in the context of Ireland's projected non-ETS emissions. The potential impact of the operational stage on climate will be positive, not significant, national, likely and long-term

5.6.3 *Climate Vulnerability*

The greatest risk of climate change to the project is from extreme weather events. The increased risk and intensity of extreme weather events could lead to damage to buildings and onsite infrastructure in the operational stage.

5.7 Likely Future Receiving Environment

It the proposed development does not proceed, the increased waste throughput capacity of the proposed development would not be realised which has implications for waste management in the Greater Dublin Area.

At present there is insufficient capacity in Dublin to handle and process the waste streams being generated. The proposed development will increase the capacity for waste handling and processing in Dublin. In the do-nothing scenario:

- Efficiencies in waste haulage associated with the bulk transportation from the MRF will not be realised
- Unsegregated MSW will be sent to waste-to-energy facilities without segregation of organics/recyclables

GHG emission generation and offset associated with the proposed development would not materialise in the do-nothing scenario.

5.8 Prevention & Mitigation Measures

5.8.1 *Design Stage*

The requirements for the conservation of fuel and energy for buildings other than dwellings are laid out in Part L of the Second Schedule to the Building Regulations 1997 (S.I. No. 497 of 1997), as amended by the Building Regulations (Part L Amendment) Regulations 2011 (S.I. 259 of 2011), the Building Regulations (Amendment) Regulations 2017 (S.I. 4 of 2017).

The above guidance on energy performance was considered at the design stage and the Design Team decided that the appropriate energy options for the development are:

- Installation of roof mounted Photovoltaic (PV) Solar Panels to supplement the electricity supply;
- Provision of energy efficient artificial lighting systems and
- Provision of electric vehicle charging points.

5.8.2 *Construction Stage*

The impact of emissions resulting from the construction stage was determined to be insignificant and therefore mitigation is not required, however best practice measures to minimise emissions will still be implemented, including:

- Planning to optimise schedules and haul routes for the delivery and removal of construction materials;
- Efficient use of construction equipment and resources, and
- Minimisation of waste generated from construction activities.

5.8.3 *Operational Stage*

The impact of the emissions from the operational stage was determined to be positive and insignificant and therefore mitigation is not required; hoewver the on-site use of the electricity generated by the solar panels in conjunction with the mitigation measures for the reduction of the impact on energy demand, including the use of energy efficient plant and equipment will contribute to a reduction in the indirect GHG associated with the proposed development.

The risks associated with the impacts of climate change on the proposed development are insignificant and additional mitigation measures are not required.

5.9 **Monitoring**

Monitoring of the effects on climate is not required during the construction and operational stages.

5.10 **Cumulative Effects**

5.10.1 *Construction Stage*

A review of South Dublin County Council's interactive planning map indicates that there are currently a number of planning applications that has been approved for a development that would involve construction activities in close proximity to the site.

The construction phase of seven approved development could potentially overlap with the construction phase of the proposed development including:

- SD23A/0135 – A warehouse expansion 600 m north of site
- SD23A/0071 – A change of use to recycling facility 840 m east of site
- SD23A/0025 – A new TII bus interchange 1.2 km northwest of site
- SD22A/0099 – 5 warehouses and ancillary office units - Adjacent to northeastern site boundary
- SD23A/0127 – Alterations to Reg. Ref. SD22A/0099 including car parking alterations adjacent to northeastern site boundary
- SD23A/0179 – 3 light industrial units additional to Reg. Ref. SD22A/0099 masterplan 50 m north east of site
- SD21A/0213 – Additional bus depot parking for Go Ahead Ireland 350 m north of site boundary

The implementation of the CEMP for the proposed development will ensure that levels of impact identified in the assessment of construction in combination with the construction phase of neighbouring developments will be maintained at levels that are negative, imperceptible, local, likely and temporary.

5.10.2 *Operational Stage*

5.10.2.1 Air Quality

The nature of the proposed development, involving waste handling and recycling activities has the potential to impact on air quality at the operational phase due to traffic associated with the proposed development. The potential impact of the operational phase of the proposed develop on air quality was found to be negative, imperceptible, local, likley and long-term.

Considering that baseline levels of air quality in the study area are well below regulatory limits, the potential impact of the operational phase of the proposed develop on air quality in combination with baseline levels of air quality was therefore also found to be negative, imperceptibel, local, likley and long term.

5.10.2.2 Odour

Baseline levels of odour in the industrial areas of the site do not appear to result in odour nuisance as there were no odour complaints recorded against any of the other six EPA licensed facilities operating within 1 km of the site in 2022. This indicates that odour levels in close proximity to each of these sites is at acceptable levels. Each of these facilities would be required not to cause odour nuisance at their respective site boundaries.

The level of odour perceived from a facility drops rapidly with distance from that facility. Baseline levels of odour in close proximity to the proposed development are therefore likely to be negligible. The cumulative impact of the proposed development in combination with baseline levels of odour in the immediate vicinity of the site are likely to be the same as the impact of the proposed development in isolation. The cumulative impact of the proposed development with baseline levels of odour was therefore determined to be negative, imperceptible, local, likely and long term.

5.11 **Residual Impacts**

5.11.1 *Construction Stage*

The impact will be negative, slight, national, likely and long-term.

5.11.2 *Operational Stage*

The impact on climate change will be negative, imperceptible, national, likely and long-term. The impact of climate change on the proposed development will be negative, imperceptible, local, likely and long-term.

5.11.3 *Summary of Impacts*

Table 5.11 Residual Impacts

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Construction Stage					
Greenhouse Gas Emissions	Negative	Slight	National	Likely	Long Term
Operational Stage					
Greenhouse Gas Emissions	Negative	Imperceptible	National	Likely	Long Term
Climate Change					
	Negative	Imperceptible	Local	Likely	Long Term

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Wavin, 2022, HT-PE Outlet-Pipe 315x12.1 L=5 EN1519 https://www.wavin.com/tr-en/katalog/Rainwater/Syphonic-System/Quickstream/HT-PE-Outlet-Pipe-315x121-L5-EN1519

6. LAND AND SOIL

6.1 Introduction

This Chapter describes the land and geology at the proposed development site and the impacts of the proposed development, including a 'baseline' scenario. It identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts. This Chapter should be read in conjunction with Chapter 7 Water, Chapter 8 Biodiversity, and Chapter 12 Landscape and Visual Impact.

The Chapter was prepared by Dr Martina Gleeson PhD of OCM. Dr Gleeson has a BSc in Environmental Geochemistry and a PhD in Geochemistry. She has over 15 years' experience of environmental impact assessment, managing environmental monitoring contracts at EPA licensed sites including the preparation of interpretive reports on air quality and noise impact assessments and the preparation of operational management plans and decommissioning management plans for large scale waste management and industrial developments and environmental impact assessment.

6.2 Relevant Legislation & Guidance

In addition to the legislation and guidance listed in Section 1.5, the assessment took into consideration the following:

- Institute of Geologists of Ireland (IGI) 'Guidelines for the Preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements' (2013);
- Guidance on Waste Acceptance Criteria at Soil Recovery Sites (EPA 2020), and
- Article 27 Guidance on Soil & Stone By-Products (EPA 2019).

6.3 Methodology

The assessment was based on professional judgement, a walkover survey of the site to establish the current land use and morphology; a desk study of databases maintained by the Geological Survey of Ireland (GSI), EPA, Teagasc and a review of a report on a site investigation completed by DBFL Consulting Engineers on the adjoining lands to the east (Ref SD 22A/0099) to establish the baseline conditions. The site investigation report on the adjoining lands is relevant as the GSI databases indicate that the subsoils at the proposed development site are similar to those in the lands to the east.

The objective of establishing the baseline conditions is to place the proposed development site within the context of the local or regional geological regimes and allow for an initial assessment of how the development and/or related activities might impact on the existing land use and the soils, subsoils and bedrock.

6.3.1 *Limitations*

There is no available information on previous site investigations at the proposed development site and given the site layout and current operational status it was not possible to complete such investigations as part of this EIA. However given the site location and development history and the site investigation

information for the lands adjoining the eastern boundary, the absence of site specific information does not limit an assessment of the likely significant impacts on Land & Soil.

6.4 Development Description

Chapter 3 provides a full description of the proposed development. Those aspects of the development of relevance to Land & Geology are;

- Site clearance including building demolition and removal of concrete paving,
- Excavation into the subsurface and stockpiling of subsoils and possibly rock
- Construction of the buildings, paved yards and installation of drainage systems
- Landscaping measures, and
- Operational stage impacts.

6.5 Receiving Environment

6.5.1 *Land Use*

The site is in an area extensively developed for commercial and industrial use, although there is a ca 7ha field to the east of the site that was used for farm animal grazing and for which planning permission has been granted for a mix of commercial uses.

The site encompasses 1.18 ha and is covered by impermeable paving and buildings, with the exception of natural hedgerows/treelines along sections of the south-western, north-western, eastern, and south eastern boundary and a landscape strip of laurel hedging along the road frontage.

6.5.2 *Geology*

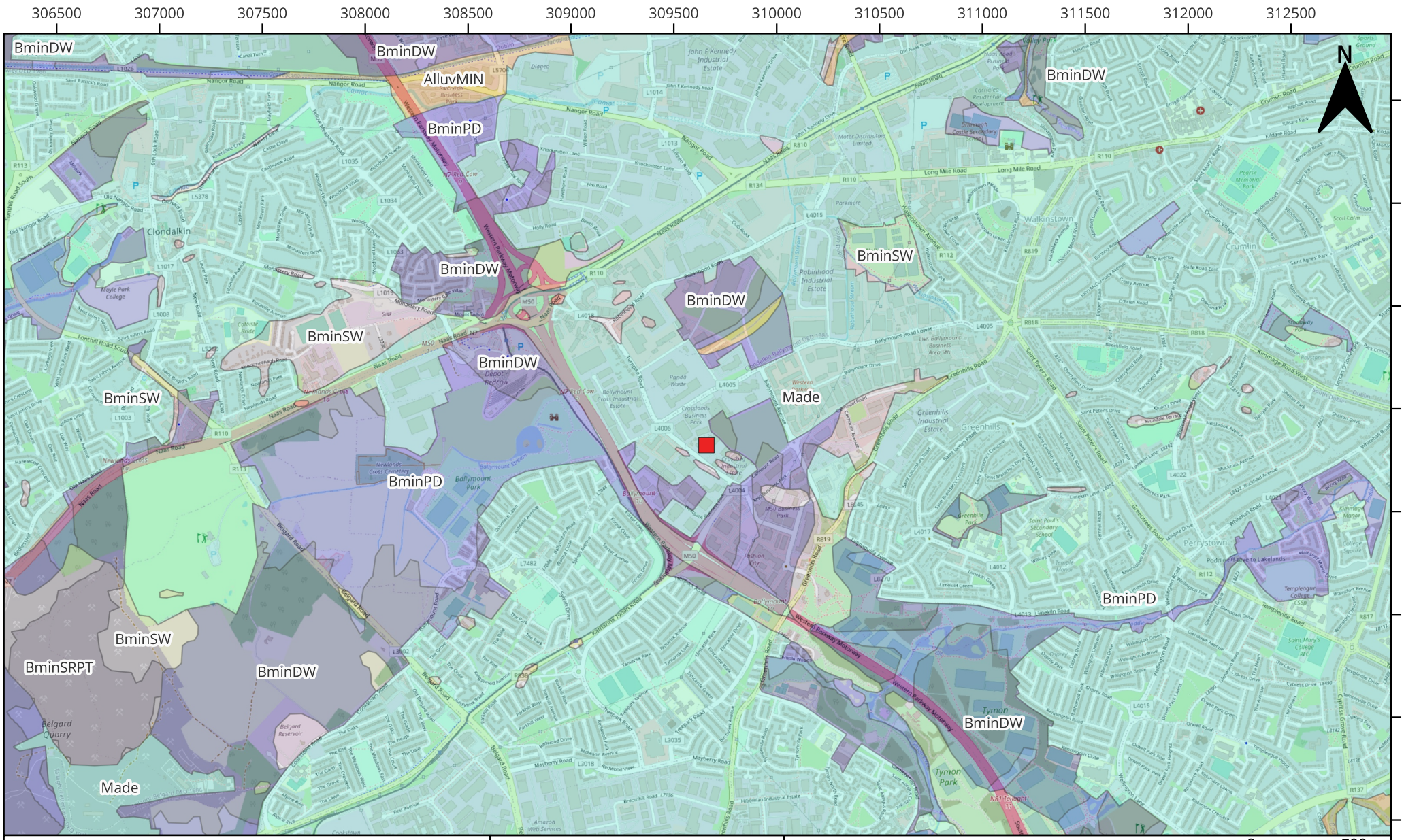
6.5.2.1 Topsoils

As the site has been extensively develop it is likely that the majority of the topsoils were removed from the site during the previous construction stages, with the exception of the vegetated areas along the site boundary. The Teagasc National Soil Map indicates that the topsoils are made ground (Figure 6.1).

6.5.2.2 Subsoils

The subsoil distribution is shown on (Figure 6.2). The site is underlain by made ground, which overlies Limestone Till. There is no site investigation information on the depth of the subsoils across the site, but based on the GSI Aquifer Vulnerability Maps (Section 7.3) the subsoils are less than 3m thick. The DBFL site investigation on the adjoining lands to the east, which involved the excavation of 19 No trial pits, established that the subsoils comprise a sandy, gravelly clay, ranging from 0.7m to 1.8m in thickness above the bedrock.

There is no information on the soil quality, however given the extensive paving; no record of any incident with the potential to result in significant soil contamination; regular inspection of the paved operational areas and integrity testing of the bunded storage areas, the risk of soil contamination is low.



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CLIENT

Starrus Eco Holdings Ltd.

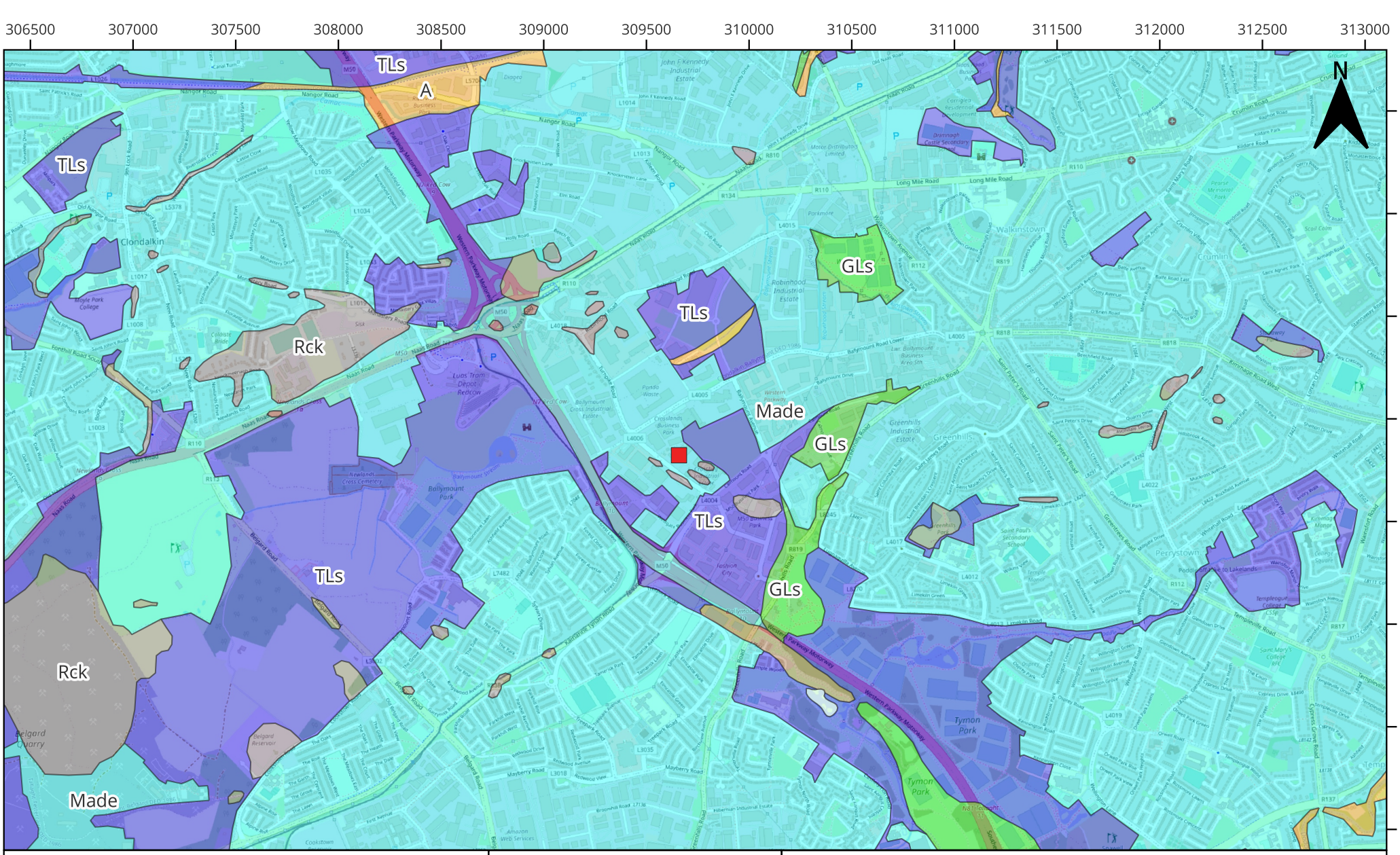
TITLE

Soils Distribution

DETAILS

- Site Location
- AlluvMIN - Mineral alluvium
- BminDW - Deep well drained mineral (mainly basic)
- BminPD - Mineral poorly drained (mainly basic)
- BminSRPT - Shallow, rocky, peaty/nonpeaty mineral complexes (mainly basic)
- BminSW - Shallow well drained mineral (mainly basic)
- Made - Made ground

FIGURE 6.1



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CLIENT
Starrus Eco Holdings Ltd.

TITLE
Subsoils

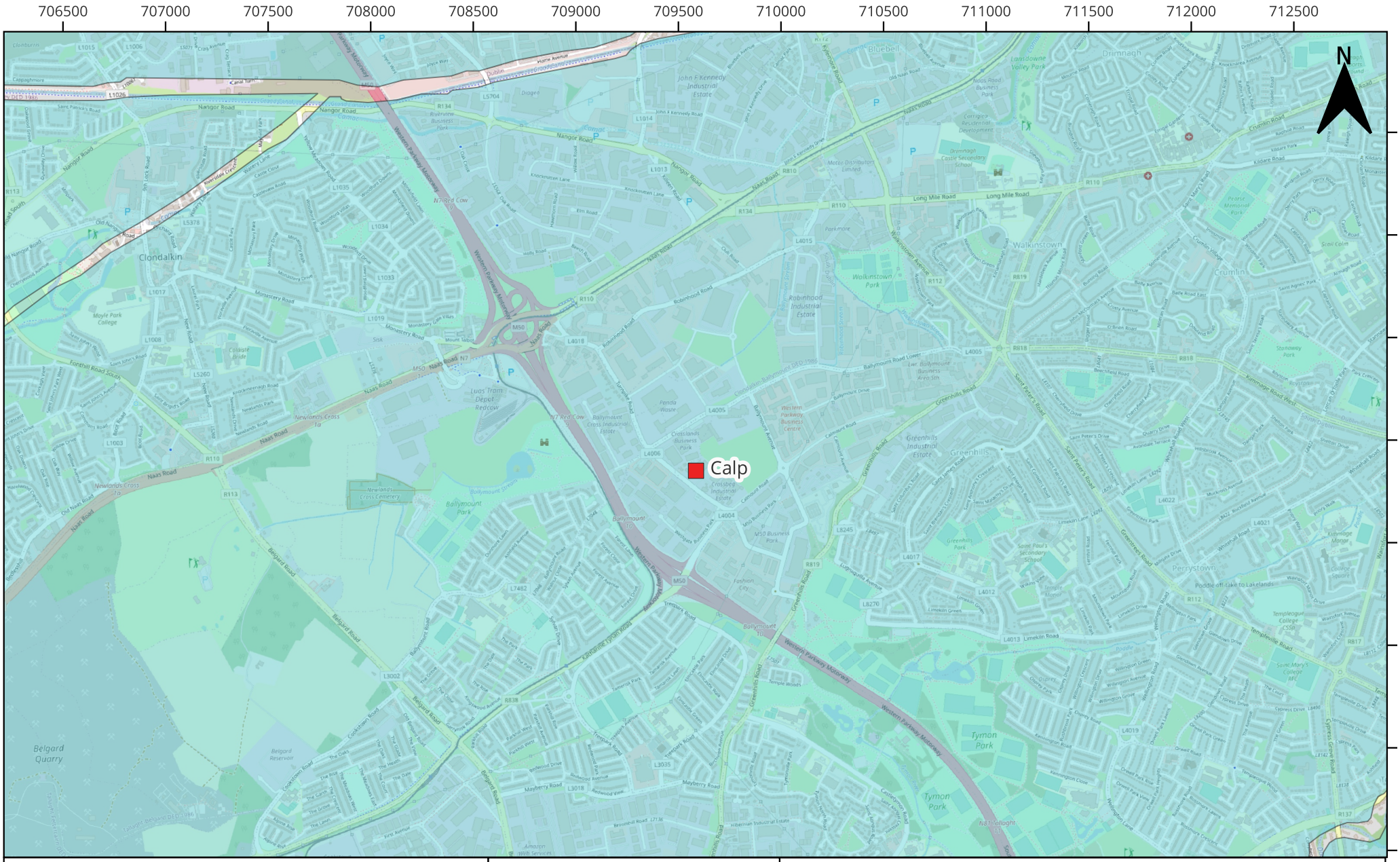
DETAILS

Site Location

Subsoils

- A - Alluvium undifferentiated
- BasEsk - Basic Esker sands and gravels
- GLs - Limestone sands and gravels (Carboniferous)
- Made - Made ground
- Rck - Bedrock at surface
- TLs - Limestone till (Carboniferous)

FIGURE 6.2



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Environmental Management for Business

CLIENT
Starrus Eco Holdings Ltd.

TITLE
Bedrock Geology

DETAILS
Site Boundary
Dublin_Stratigraphy (GSI)
Lucan Formation

0 500 m

FIGURE 6.3

6.5.3 *Bedrock*

The GSI Bedrock Geology map (1:100000) indicates that the site area is underlain by Calp formation with dark grey to black limestone and shale. The GSI Bedrock Dublin GeoUrban Geology map (1:50000) provides more detailed information based on mineral exploration reports and old geology maps. It confirms that the site is underlain by dark limestone and shale (Calp) and is described as the Lucan Formation (Figure 6.3). The DBFL investigation on the adjoining lands established that the upper 0.3m of the bedrock is weathered.

6.6 **Impacts**

6.6.1 Land Take

Land take is defined as the transformation of natural and semi-natural land to urban and other artificialized land[8]. It affects habitats and ecosystems, both directly by reducing their area, and indirectly through fragmentation and degradation. As the site is already extensively developed and there will be no changes to the existing site boundaries the proposed development will not result in any Land Take.

6.6.1 *Construction Stage*

The development will involve the demolition of the current buildings, removal of sections of the existing concrete paving and excavations in the subsurface for building foundations and underground services. Where possible the excavated subsoils will be retained on site. Depending on the depth of the subsoils there may be a need to excavate into the upper weathered layer of the bedrock to install underground services.

In the absence of mitigation, there is the potential for spills/leaks to occur in areas where polluting substances (e.g. oils) are handled and when refuelling mobile plant that could impact the exposed subsoils. Pouring of concrete has the potential to impact on the pH of the subsoils, while the temporary stockpiling of subsoils gives rise to potential wind erosion.

6.6.2 *Operational Stage*

In the operational stage, rainwater run-off that is not harvested will infiltrate to ground via damaged paving. There is the potential for accidental spills to occur when the diesel storage tank is being filled and during the refuelling of the mobile plant which could infiltrate to ground through damaged paving. There is also the potential that minor oil leaks from vehicles in damaged paved areas and leaks from the foul sewers could infiltrate to ground

In the event of a fire, which is the' worst case' scenario there is the potential for contaminated firewater run-off to infiltrate to the soil via damaged paving and leaking sewers.

6.7 **Likely Future Receiving Environment**

If the proposed development does not proceed there will be no change to the current operations. There will be no risk of adverse impacts associated with a constructions stage and no infiltration of rainwater to ground in the operational stage.

[8] https://www.eea.europa.eu/data-and-maps/indicators/land-take-3/assessment

6.8 Prevention and Mitigation Measures

6.8.1 *Design*

It was a design objective to retain as much of the boundary hedgerows as possible. Given the nature of the development design stage prevention and mitigation measures are not required to reduce the effects of land take.

The storm water drainage system design includes SuDs measures as detailed in Section 3.10.3 of the EIAR. The permeable paving that will be provided in the parking areas is designed to filter out and degrade the small amounts of oil that may leak from parked vehicles.

The fire safety measures included in the design to mitigate the risk of fire outbreak are described in Section 10.8.1.6. The EPA licence will require the Firewater Retention Assessment (Ref Section 2.25.2) to be revised and updated to assess the new site layout and method of operations. The purpose of the review will be to assess the suitability of the site infrastructure to retain all firewater run-off inside the site and prevent infiltration to ground. This was taken into consideration at the design stage and a shut-off valve will be installed on the inspection chamber upstream of the soakaway that will automatically close in the event of a fire to prevent the entry of firewater run-off.

The EPA has recently published a National End of Waste Protocol for the production of recycled aggregates from construction and demolition waste and in the detailed design stage of the development, the feasibility of using the recycled aggregated as a replacement for quarry won materials in the construction stage will be assessed

6.8.2 *Construction Stage*

A Construction Environmental Management Plan (CEMP) describing the proposed construction mitigation measures has been prepared and a copy is in Appendix 3.3. A Resource and Waste Management Plan (RWMP) has also been prepared and a copy is in Attachment 3.2. Both documents will be updated in advance of the construction stage to take into consideration any additional measures that may be required by conditions attached to planning permission.

The mitigation measures include:

- A construction compound will be established at a selected location agreed in advance with South Dublin County Council. All construction materials with the potential to impact on soils, for example oils will be stored in secure bunded areas within the compound;
- Drip trays will be provided for drum storage and will be capable of holding at least 25% of the drum capacity. Where more than one drum is stored, the drip tray capacity will be 25% of the aggregate volume of the drums stored;
- Provision and maintenance of appropriate spill clean-up equipment and training of staff in its proper use. Any spillages will be immediately contained and contaminated soil removed from the site and disposed of in a licensed waste facility;
- Refuelling of the mobile plant will be undertaken by trained personnel in a designated area where appropriate spill control materials are to hand;
- All construction and demolition plant items will be regularly checked to ensure there are no leaks or drips of oils to ground, and

- Provision of appropriate waste receptacles (bins and skips) in the construction compound and at strategic locations in the works area.

6.8.3 *Operational Stage*

The impermeable paved yards and the building floor will be subject to regular inspection and repair as required by the conditions of the EPA licence. The above ground oil storage bund and the underground drains will be subject to regular inspection, with integrity testing completed every three years as required by the EPA licence. Staff will be trained in accident response actions and appropriate spill clean-up equipment will be maintained on site.

Gully bungs will be maintained on site and, in the event of a fire will be fitted to the gullies connected to the infiltration trench located in the north of the site to prevent the entry of firewater run-off.

The fire safety and emergency response measures that will be implemented in the operational stage to mitigate the risk of fire outbreak and, if one does occur, to ensure the appropriate response actions are taken to ensure the fire is extinguished as quickly as possible so as to minimise the adverse environmental impacts are detailed in Section 10.8.3.1.

6.9 **Monitoring**

6.9.1 *Construction Stage*

6.9.1.1 Baseline Soil Conditions

The EPA licence will require monitoring of the soil conditions at specified intervals to allow an assessment over time of the impact of the waste activities on the soil conditions. Following the completion of the site clearance works a baseline soils assessment will be carried out. This will be completed by an environmental consultant and will involve the collection of representative soils samples and laboratory analysis for a range of parameters including pH, hydrocarbons and metals. The results will be submitted to the EPA and will be publicly accessible.

6.9.1.2 Soil Contamination

In the course of the construction works the subsoils will be inspected to assess for the presence of contamination. If contamination is identified an investigation will be carried out to determine the lateral and vertical extent.

The investigation will be completed by an environmental consultant with experience in the assessment of contaminated land. It will include the collection and laboratory testing of subsoil samples to allow an assessment of the environmental risk and to complete a waste classification to identify appropriate off-site management options.

Once the waste classification has been completed all of the impacted soils will be removed from the site and sent to a waste management facility authorised to accept and treat them.

6.9.1.3 Materials & Waste Management

All materials and waste handling and storage practices will be check to ensure they are in accordance with the CEMP and RWMP. Where non-conformances are identified appropriate corrective actions will be implemented.

6.9.2 *Operational Stage*

A soils assessment will be completed in accordance with the frequency set in the EPA licence to compare the soil conditions against the baseline data. The results will be submitted to the EPA and will be accessible to the public. If there is a deterioration in soil quality a remedial programme, whose scope will be agreed in advance with the EPA, will be implemented.

6.10 Cumulative Impacts

The future development on the lands to the north-east of the site will result in the 'land take' of approximately 7 ha; however as the proposed development does not involve any' land take' it will have no cumulative effects on developments within the Ballymount Industrial Estate and the wider City Edge.

6.11 Residual Impacts

The proposed development does not involve land take, but does include ground disturbance including the excavation of subsoils and possibly the bedrock and the removal, if required, of surplus materials in the construction stage.

The proposed development includes SuDS measures that involve the infiltration of rainwater from building roofs and areas of permeable paving to ground. The permeable paving is designed to protect soil quality. The development will have a neutral, imperceptible, local, unlikely and permanent impact on land and a negative, imperceptible, local, likely and long term impact on soil.

6.11.1 *Summary of Residual Impacts*

Table 6.1 Residual Impacts

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Land Take	Neutral	Imperceptible	Local	Unlikely	Permanent
Soil	Negative	Imperceptible	Local	Likely	Permanent

6.12 References

European Environment Agency, 2019b. Land take in Europe. Indicator Assessment. Available at: https://www.eea.europa.eu/data-and-maps/indicators/land-take-3/assessment

7. WATER

7.1 Introduction

This Chapter describes the surface water and the groundwater conditions at the proposed development site and the impacts the development will have on surface water and groundwater within and outside the site boundary, including a 'baseline' scenario. It identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts. This Chapter should be read in conjunction with Chapter 6 Land & Soils, Chapter 8 Biodiversity and Chapter 10 Population and Health.

The Chapter was prepared by Ms Marzena Nowakowska MSc of OCM. Ms Nowakowska has an MSc in Geology, majoring in mineral and water resource management and has over 15 years' experience in water resource and hydrogeological assessments including water quality monitoring, hydrogeological mapping and water resource management at regional level.

Mr. Moran holds an MSc in Hydrogeology and is a member of the Institute of Geologists of Ireland (P.Geol.), the European Federation of Geologists (Eur. Geol.) and the Chartered Institute of Water and Environmental Management. He has over 30 years of experience in the field hydrological and hydrogeological assessment and EIA.

7.2 Relevant Legislation & Guidance

The general EIA legislation and guidance documents are listed in Section 1.5. The legislation and guidelines relevant to Water considered in the preparation of this Chapter include:

- Local Government Water Pollution Acts 1977 & 1992, as amended.
- European Union Water Framework Directive (2000/60/EC).
- European Communities Environmental Objectives (Groundwater) Regulations (SI No 9 of 2010), as amended.
- European Communities Environmental Objectives (Surface Water) Regulations (S.I. No 272 of 2009), as amended.
- Institute of Geologists of Ireland (IGI) 'Guidelines for the Preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements' (2013).

7.3 Methodology

The assessment was based on professional judgement, a walkover survey of the site to establish the current land use and morphology; a desk study of hydrogeological and hydrological databases maintained by the GSI and EPA, the River Basin Management Plan (RBMP) 2018-2021 and a review of a report on a site investigation completed by DBFL Consulting Engineers on the adjoining lands to the east (Ref SD 22A/0099) to establish the baseline conditions. The site investigation report on the

adjoining lands is relevant as the GSI databases indicate that the subsoils at the proposed development site are similar to those in the lands to the east.

The objective of establishing the baseline conditions is to place the proposed development site within the context of the local or regional geological regimes and allow for an initial assessment of how the development and/or related activities might impact on surface water and groundwater.

There is no available information on previous site investigations at the proposed development site and given the site layout and current operational status it was not possible to complete such investigations as part of this EIA. However given the site location and development history and the site investigation information for the lands adjoining the eastern boundary, the absence of site specific information does not limit an assessment of the likely significant impacts on hydrogeology.

7.4 Development Description

Chapter 3 provides a full description of the proposed development. Those aspects of the development relevant to Water are;

- Site clearance including building demolition stripping and stockpiling of subsoils and possible excavation of weathered bedrock;
- Construction of the buildings, paved yards and installation of surface water and foul water drainage systems, and
- Operational stage impacts.

7.5 Receiving Environment

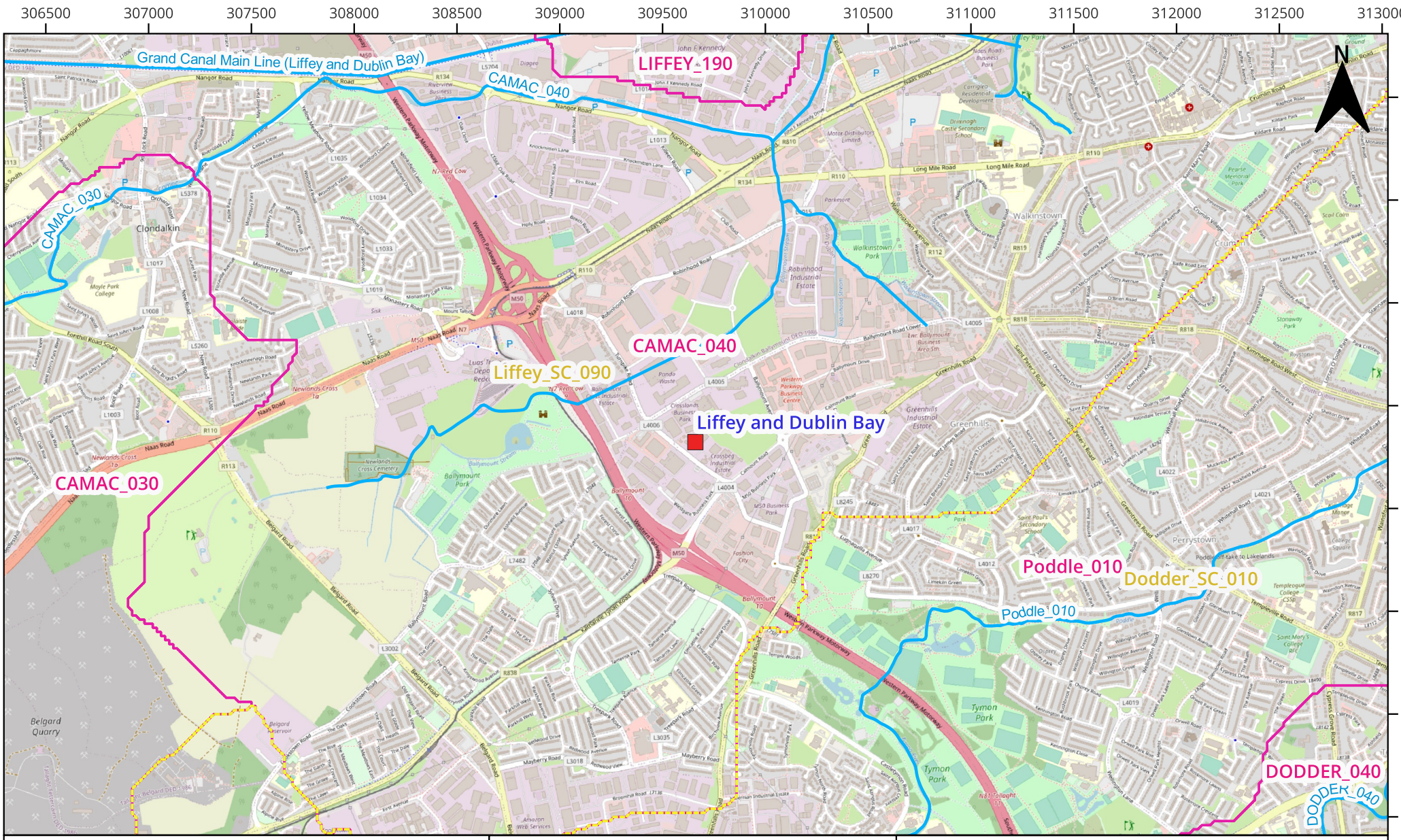
7.5.1 *Hydrology*

The local and regional hydrological conditions are shown on Figure 7.1. There are no watercourses within the site boundary and the closest water feature is Ballymount (Coolfan) Stream, which is approximately 410m to the north-west. Other watercourses in the vicinity include Walkinstown (Robinhood) Stream 1.1km to the north-east and the Poddle Stream 1.4km south-east. All of the streams are tributaries of the River Liffey River.

The development site is in the catchment of the River Liffey, which is ca. 3.8km to the north. The Liffey is one of Dublin's three main rivers, rising in Liffey Head Bog in Wicklow Mountains (County Wicklow) flowing through Blessington, Newbridge, Clane and Celbridge and entering Dublin Bay between North Wall and Ringsend. The Ballymount Stream flows into River Liffey in the vicinity of Dublin Heuston Railway Station. This part of River Liffey is regarded as Transitional Waterbody.

The development site is located in the IE_EA_Cammock Water Management Unit (WMU) as designated in the national River Basin Management Plan (RBMP) prepared in accordance with the European Union Water Framework Directive (WFD).

The WMU comprises various Water Bodies and the site is in the Liffey and Dublin Bay, subcatchment Liffey_SC_090 and CAMAC_040 River Water Body. Status Reports have been prepared for this Water Body. Status means the condition of the water in a watercourse and is defined by its ecological and chemical conditions, whichever is worse. Water Bodies are ranked in one of five classes,' High', 'Good', 'Moderate', 'Poor' and 'Bad'.



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CLIENT

Starrus Eco Holdings Ltd.

TITLE

Local and Regional Hydrology

DETAILS

- Site Location
- Rivers
- WFD_RiverSubBasins
- WFD_Subcatchments
- WFD_Catchments

0 500 m

FIGURE 7.1

The WFD requires measures to ensure waters achieved at least 'Good Status' by 2015 and that their current status does not deteriorate. Where necessary, for example in heavily impacted or modified watercourses, extended deadlines (2021 and 2027) were set for achieving the following objectives:

- Prevent Deterioration
- Restore Good Status
- Reduce Chemical Pollution
- Achieve Protected Areas Objectives

The objectives for particular watercourses are based on 'Pressure and Impact Assessments' of human activity, including point and diffuse emissions, land use and morphological conditions on surface waters to identify those water bodies that are 'At Risk' of failing to meet the WFD objectives. The ecological status/potential of the Liffey SC09 and Camac_40 is classified as 'Poor and the river is 'At Risk' of meeting its RBMP objectives.

7.5.2 *Hydrogeology*

7.5.2.1 Subsoils

While the subsoils beneath the site can contain isolated water bearing lenses of permeable gravels they are not classified as an aquifer. The DBFL site investigation on the adjoining lands to the east, which was carried out in November 2022 when the water table is usually high, did not encounter groundwater in any of the 19 No trial pits.

7.5.2.2 Aquifer Classification

The GSI aquifer map indicates that the bedrock that underlies the site (Lucan Formation) is classified as a locally important bedrock aquifer, moderately productive only in local zones (Figure 7.2). A review of the GSI groundwater well database identified that the closest recorded abstraction well is ca 1.28 km to the north-west. This has a reported yield of 480m^3/day and is for industrial use.

7.5.2.3 Aquifer Vulnerability

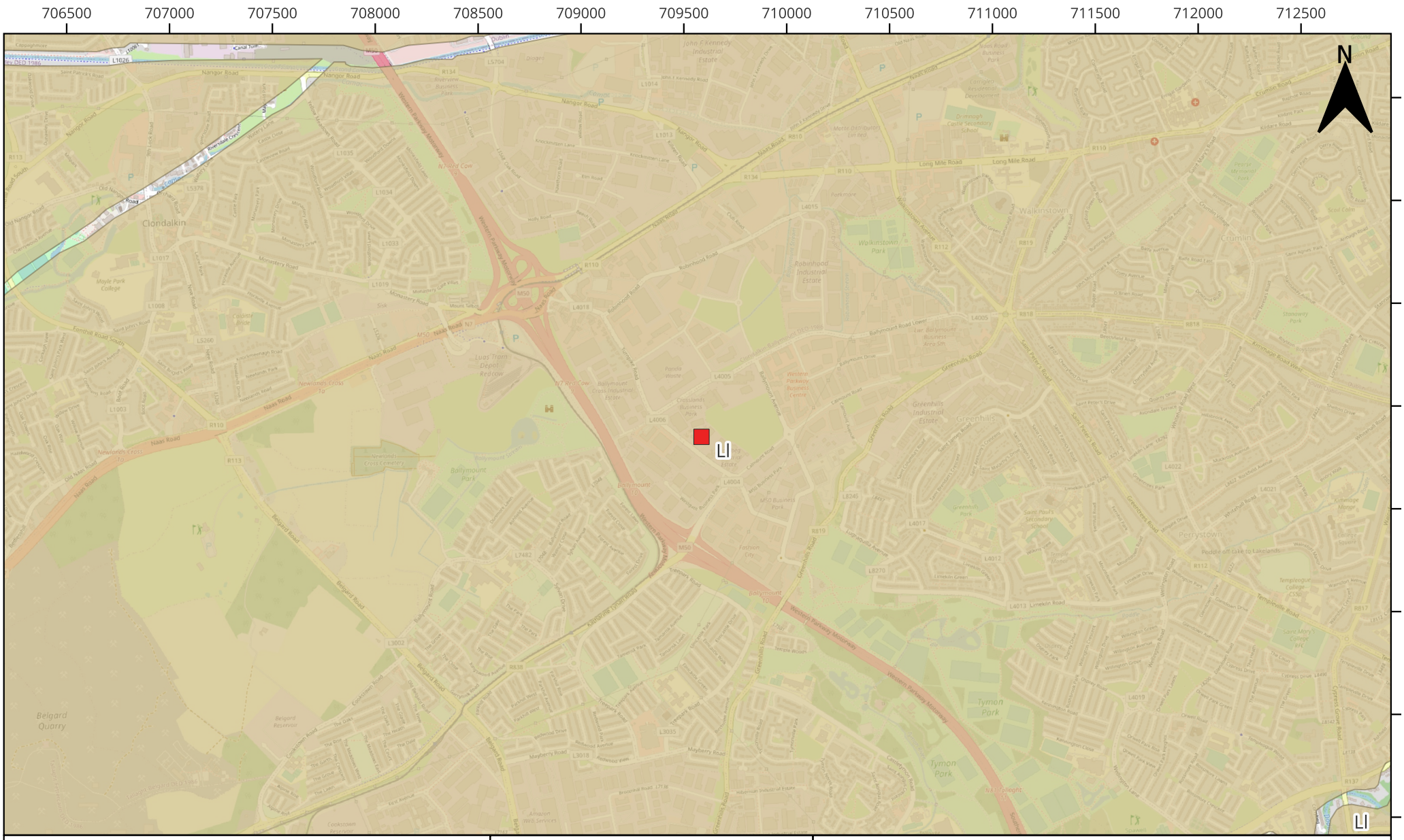
The GSI defines vulnerability as the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The GSI uses four groundwater vulnerability categories - Extreme, High, Moderate and Low based on the permeability and thickness of the subsoils overlying the aquifer. The GSI groundwater vulnerability map indicates that due to the type and thickness of the subsoils the aquifer vulnerability of the site is 'Extreme' (Figure 7.3). However the extensive impermeable paving across the site minimise the risk of groundwater contamination

7.5.2.4 Recharge

The GSI Groundwater Recharge map indicates the average annual recharge to the groundwater aquifer is 68 mm/year (Figure 7.4).

7.5.2.5 Groundwater Flow Direction

The direction of groundwater flow is related to the morphology. Within the site boundary the direction of shallow groundwater flow is to the north towards the River Liffey.



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CLIENT
Starrus Eco Holdings Ltd.

TITLE
Aquifer Classification

DETAILS

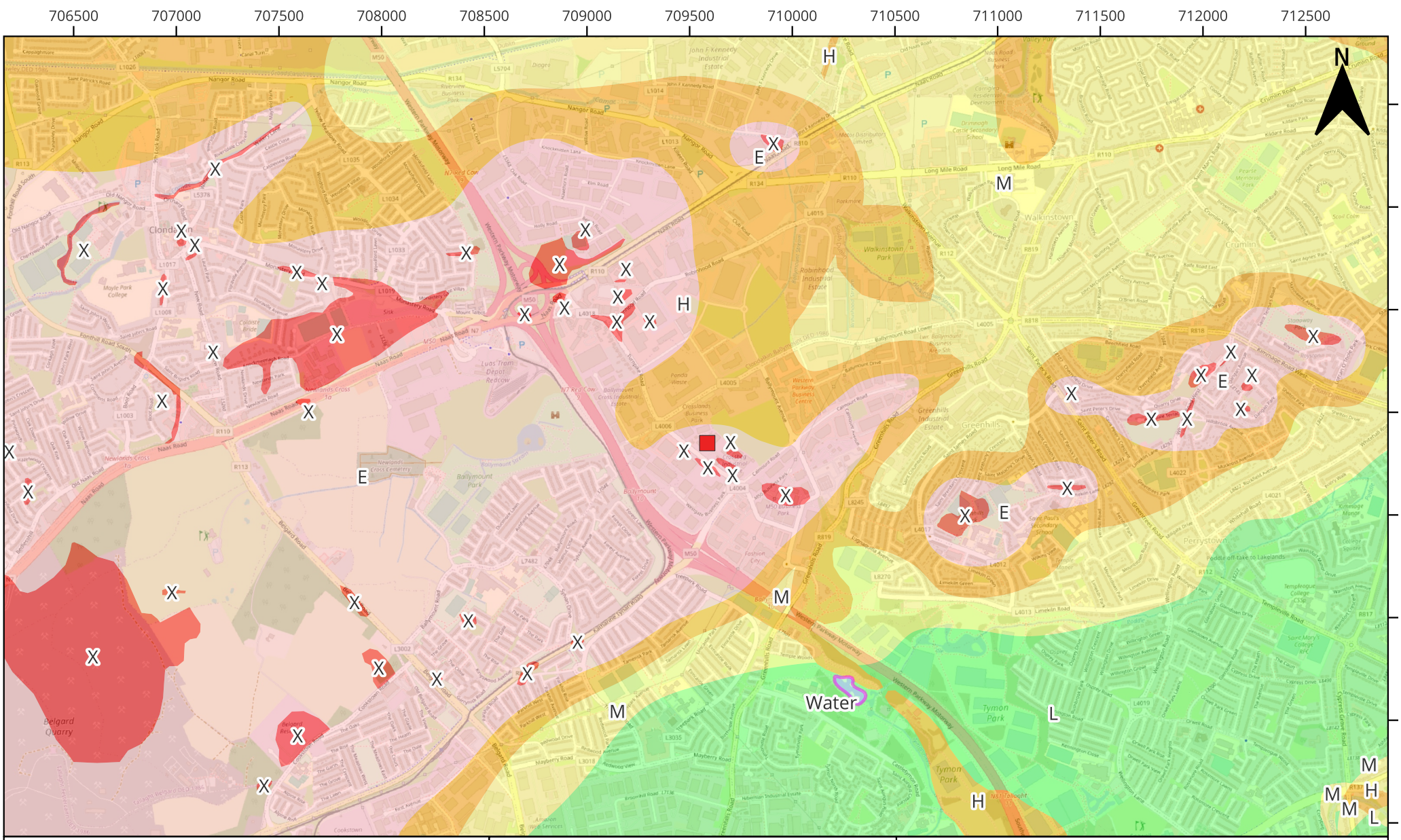
Site Boundary

Aquifer Classification

LI - Locally Important Bedrock Aquifer, Moderately Productive only in Local Zones

0 500 m

FIGURE 7.2



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CLIENT

Starrus Eco Holdings Ltd.

TITLE

Aquifer Vulnerability

DETAILS

Site Location

Vulnerability

X - Bedrock near Surface

E - Extreme

H - High

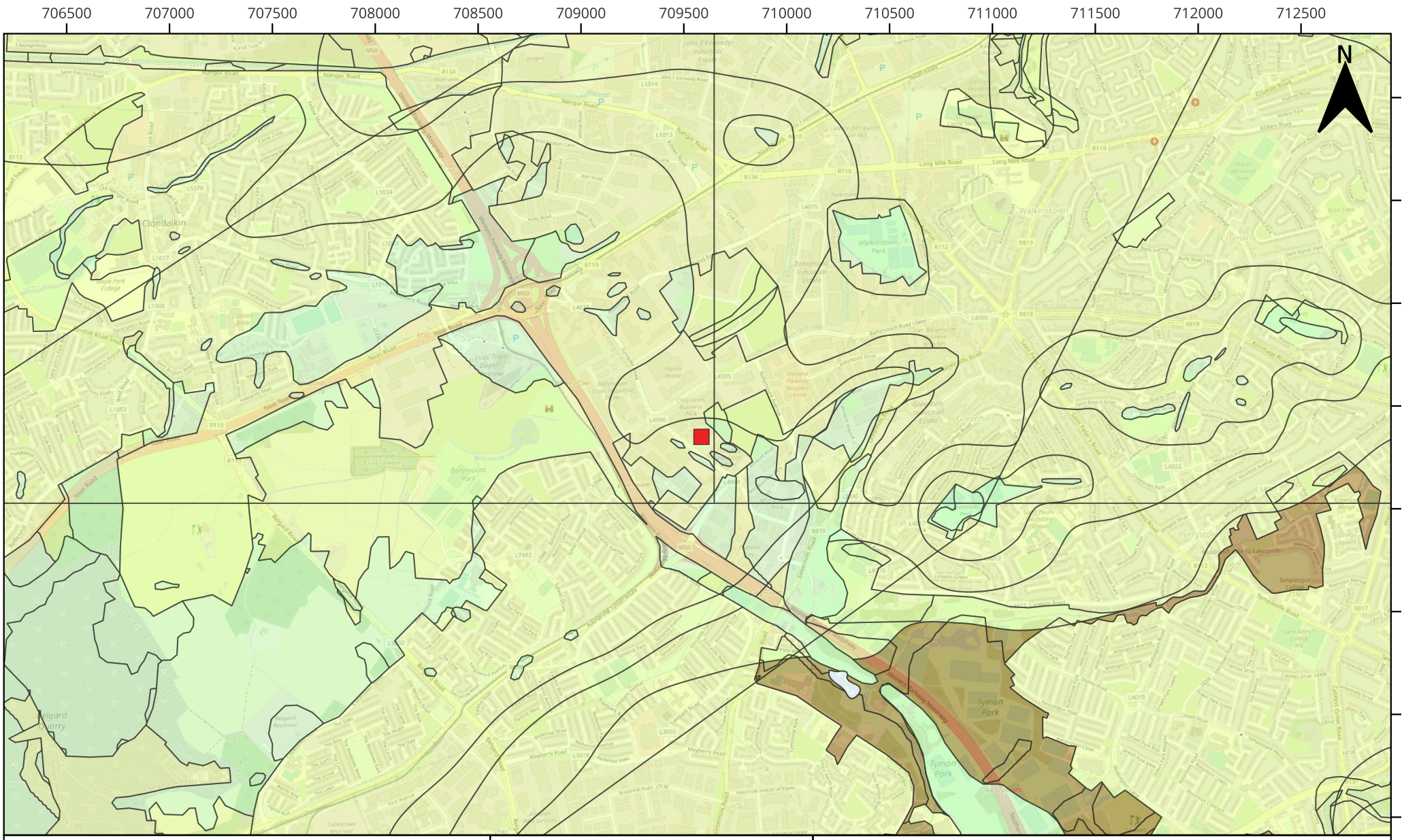
L - Low

M - Moderate

Water

0 500 m

FIGURE 7.3



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CLIENT
Starrus Eco Holdings Ltd.

TITLE
Aquifer Classification

DETAILS

Site Location

GSI Groundwater Recharge

- 101-150
- 51-100
- 1-50

0 500 m

FIGURE 7.4

7.5.3 *Groundwater Quality*

The EPA licence does not require groundwater monitoring and there are not on-site groundwater monitoring wells, therefore there is no information on groundwater quality beneath the site. The bedrock aquifer belongs to the Dublin Groundwater Body (IE_EA_G_009) designated in the RBMP. The condition of a Groundwater Body is defined by its chemical and quantitative status, whichever is worse, and groundwater quality is ranked in one of two status classes: Good or Poor.

The initial assessment of the overall status of the water body determined in the Eastern River Basin District Management Plan 2009-2015 was 'Good' and the overall objective is to 'protect' the status and the overall risk is 'at risk'. The condition of the Groundwater Body is currently being reviewed as part of the on-going RBMP and therefore the current status has not been determined.

7.5.4 *Flood Risk*

The mapping on the OPW www.floodinfo.ie website confirms the site is neither in, nor adjacent to a location that is at risk of fluvial, pluvial or groundwater flooding and there are no records of any flood events either at, or in proximity to the site. ORS prepared a Site Specific Flood Risk Assessment, a copy of which is in Appendix 7.1. The FRA established the proposed development site is in Flood Zone C, and therefore the flood risk is low.

ORS analysed the proposed development site for risks from tidal flooding from the Irish Sea, fluvial flooding, pluvial flooding, groundwater, reservoir flooding and drainage system failures due to human error or mechanical system failure. ORS concluded that as the flood risk from all sources can be mitigated, reducing the flood risk to low or very low, the proposed development is considered acceptable in terms of flood risk. ORS also concluded that the risk of an increased flood risk elsewhere caused but the development is low.

7.6 **Impacts**

7.6.1 *Construction Stage*

The development will involve the demolition of the current buildings, ripping of sections of the existing concrete paving and excavations in the subsoils for building foundations and underground services. The works may require excavation into the upper weather layer of the bedrock. While there may be water bearing lenses in the subsoils and in the upper weathered layer of the bedrock the volume of water likely to be present will be small and dewatering measures will not be required.

In the absence of mitigation, there is the potential for spills/leaks to occur in areas where polluting substances (e.g. oils) are handled and when refuelling mobile plant that could impact the exposed subsoils. Pouring of concrete has the potential to impact on the pH of groundwater if present.

7.6.2 *Operational Stage*

In the operational stage, all wastes will be stored inside the building which will reduce the potential for impacts by run-off from the external storage areas.

Rainwater run-off from the northern roof pitch will infiltrate to ground via the soakaway and migrate downwards to the bedrock aquifer. There is the potential for accidental spills to occur when the diesel storage tank is being filled and during the refuelling of the mobile plant which could infiltrate to ground through damaged paving. There is also the potential that minor oil leaks from vehicles in

the damaged paved areas and leaks from the foul sewers could infiltrate to ground and move downward to the bedrock aquifer.

In the event of a fire, which is the' worst case' scenario there is the potential for contaminated firewater run-off to infiltrate to the bedrock aquifer via the soakaway, permeable paving and damaged paving/storm drains.

7.7 Likely Future Receiving Environment

If the proposed development does not proceed the current land use will continue in the short term and there will be no change to the potential impacts on, surface water and groundwater.

7.8 Prevention & Mitigation Measures

7.8.1 *Design Stage*

7.8.1.1 Sustainable Urban Drainage Systems (SuDs)

The storm water drainage system design includes SuDs measures as detailed in Section 3.10.3 of the EIAR. The permeable paving that will be provided in the car parking areas is designed to filter to filter out silt and adsorb and subsequently biodegrade low level oil contamination caused by small amounts of oil that may leak from parked vehicles.

All surface water run-off discharging to the Uisce Eireann storm sewer will pass through a Class 1 Full Retention Oil Separator designed to achieve an oil concentration in the outflow of less than 5mg/l.

The fire safety measures included in the design to mitigate the risk of fire outbreak are described in Section 10.8.1.6. As referred to in Section 6.8.1, the design took into consideration the need to provide adequate firewater retention capacity.

A shutoff valve will be installed on the surface water inspection chamber upstream of the soakaway which will be automatically closed in the event of a fire to prevent the entry of firewater run-off. Automated shut off valves will also be installed to prevent the entry of firewater run-off to the Uisce Eireann storm and foul sewers. Gully bungs will be maintained on site and, in the event of a fire will be fitted to the gullies connected to the infiltration trench located in the north of the site to prevent the entry of firewater run-off.

7.8.1.2 Oil Interceptor

All surface water run-off from HGV trafficked areas will pass through a Class 1 Separator upstream of the soakaway. Bypass separators fully treat all flows generated by rainfall rated of up 6.5mm/hour, which covers over 99% of all rainfall events. Flows from events above this rate are allowed to bypass the separator.

Bypass separators are used at sites where it is considered the risk of a large spillage and heavy rainfall occurring at the same time is small. A Class 1 interceptor is designed to achieve an oil concentration in the outflow of less than 5mg/l.

7.8.1.3 Permeable Paving

The permeable paving, while allowing rain fall to infiltrate to ground, is also designed to filter out silt and adsorb and subsequently biodegrade low level oil contamination.

7.8.1.4 Fire Safety

The fire safety measures included in the design to mitigate the risk of fire outbreak are described in Section 10.8.1.6.

7.8.2 *Construction Stage*

The CEMP and RWMP describe the proposed construction mitigation measures, including the management of wastes that will be implemented. As referred to in Section 6.8.2 both documents will be updated in advance of the construction stage to take into consideration any additional measures that may be required by conditions attached to planning permission. The measures that will be implemented to mitigate the effects on soil (Section 6.8.2) apply equally to surface water and groundwater. In addition the following control measures will be applied when concrete is poured:

- Pouring of cementitious materials will be carried out where possible in dry periods based on weather forecasts. Plastic covers will be available in case of a sudden rainfall event.
- The concrete pumping will be monitored to ensure no accidental discharge.
- Excess concrete will be removed from the site and concrete washout, with the exception of chute cleaning, will not be permitted on the site
- There will be no hosing into surface water drains of spills of concrete, cement, grout or similar materials

7.8.3 *Operational Stage*

The SuDs infiltration measures in surface water drainage system will maximise the groundwater recharge within the site, in so far as can be accommodated at an EPA regulated site. The provision and maintenance of the Class 1 Oil Separator on the outflow to the Uisce Eireann storm sewer will mitigate the impacts of any minor oil leaks that occur from vehicles. In the areas where the permeable paving is provided the biodegradation of hydrocarbons will occur within the subbase.

The impermeable paved yards and the building floor will be subject to regular inspection and repair as required by the conditions of the EPA licence. The above ground oil storage bund and the underground drains will be subject to regular inspection, with integrity testing completed every three years as required by the EPA licence. Staff will be trained in accident response actions and appropriate spill clean-up equipment will be maintained on site.

Gully bungs will be maintained on site and, in the event of a fire will be fitted to the gullies connected to the infiltration trench located in the north of the site to prevent the entry of firewater run-off.

The fire safety and emergency response measures that will be implemented in the operational stage to minimise the risk of fire outbreak and, if one does occur, to ensure the appropriate response actions are taken to ensure the fire is extinguished as quickly as possible are detailed in Section 10.8.3.1.

7.9 Monitoring

7.9.1 *Construction Stage*

The works will be regularly inspected to ensure that materials and waste handling and storage practices are in accordance with the CEMP and RWMP. Where non-conformances are identified appropriate corrective actions will be implemented.

7.9.2 *Operational Stage*

In addition to the inspections referred to in Section 7.8.3, the oil interceptor will be inspected weekly to ensure it is functioning properly and will be cleaned out as required. The discharge from the interceptor will be monitored at frequency specified in the EPA licence and the parameters will, at a minimum, include hydrocarbons.

The results will be compared to the emission limit values set by the EPA to protect off-site surface water quality. An exceedance of an emission limit value will be considered to be an incident, reported to the EPA and the appropriate corrective actions implemented to avoid a reoccurrence. The monitoring results and all incident investigation reports will be submitted to the EPA and will be publically accessible.

7.10 Cumulative Impacts

As the area of the site will remain the same there will be no material change to the volume of rainwater run-off generated. However the SuDs measures based on the infiltration of run-off to ground will reduce the volume discharging to the Uisce Eireann storm sewer and will have a slight, positive, local, likely and long term cumulative effect in combination with the other permitted developments whose surface water drainage systems connect to the Uisce Eireann storm sewer.

The infiltration based SuDs measures will increase the groundwater recharge rate and will have a positive, imperceptible, local, likely and long term cumulative effect in combination with other permitted developments that deploy SuDs based measures on the bedrock aquifer quantitative status and a neutral imperceptible, local, likely and long term cumulative effect on groundwater quality.

7.11 Residual Impacts

7.11.1 *Construction Stage*

There will be no emissions to on or off-site water features and therefore no impacts on surface waters. There is the potential for accidental spills of polluting materials to occur; however the mitigation measures specified in the CEMP will minimise the associated impacts.

The construction stage will increase the groundwater vulnerability as a result of removing the subsoils and the possibly sections of the upper weathered layer of the bedrock and the impact will be negative, imperceptible, local, likely and permanent. There is the potential for accidental spills of polluting substances however given the mitigation measures that will be implemented the impact of any such spills on groundwater quality would be negative, imperceptible, local, unlikely and short term.

7.11.2 *Operational Stage*

Rainwater run-off that is not harvested and infiltrated to ground will discharge to the Uisce Eireann Storm sewer. The flow rate will be restricted to greenfield rates, which will have a slight, positive, long

term and local impact on the capacity of the Uisce Eireann sewer. It will also reduce the risk of flooding downstream of the site. The EPA licence will specify emission limit values for the discharge to the sewer designed to prevent pollution of the Uisce Eireann storm sewer and protect the status of the receiving water body. The EPA licence will also require routine monitoring to confirm compliance with the limits.

The storm water drainage system is designed to maximise the groundwater recharge within the site boundary, in so far as is practical in an EPA regulated site, but the discharge to ground has the potential to indirectly impact on groundwater quality. The permeable paving is designed to protect groundwater quality.

The operational stage will have a neutral, imperceptible, local, likely and long term impact on groundwater quality, and a positive, imperceptible, local, likely and long term impact on the quantitative status of the bedrock aquifer.

7.11.3 *Summary of Residual Effects*

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Construction Stage					
Aquifer Vulnerability	Negative	Imperceptible	Local	Likely	Permanent
Groundwater Quality	Negative	Imperceptible	Local	Unlikely	Short Term
Operational Stage					
Surface Water Flow	Positive	Slight	Local	Likely	Long Term
Surface Water Quality	Neutral	Imperceptible	Local	Likely	Long Term
Groundwater Qualitative Status	Neutral	Imperceptible	Bedrock Aquifer	Likely	Long Term
Groundwater Quantitative Quantitative Status	Positive	Imperceptible	Bedrock Aquifer	Likely	Long Term

8. BIODIVERSITY

8.1 Introduction

This Chapter describes the biodiversity of the site and the impacts the proposed development will have on flora (plants), fauna (animals), and habitats. It identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the impacts, assesses the likely future receiving environment and discusses residual impacts.

This Chapter should be read in conjunction with Chapter 6 Land & Soil, Chapter 7 Water, Chapter 9 Air, Chapter 10 Population & Human Health and Chapter 12 Land & Visual Impact and the Appropriate Assessment Screening Report submitted separately with the planning application.

The Chapter was prepared by Carl Dixon MSc (Ecological Monitoring) and Dr. Sorcha Sheehy PhD (Ecology/ornithology). Fieldwork was completed by Mr Carl Dixon.

Mr Dixon holds an Honours Degree (BSc) in Ecology and a Masters (MSc) in Ecological Monitoring from UCC. He is a senior ecologist who has over 25 years' experience of ecological assessment. He has particular expertise in freshwater ecology, including electrofishing fish stock assessments and water quality assessments. He also has considerable experience in habitat mapping and mammal ecology, including survey work and reporting in relation to badgers and bats. Other competencies include surveys for invasive species and bird surveys.

Mr Dixon has extensive experience with regards to EIAR and Natura Impact Statement mitigation and impact assessment. He has experience large-scale industrial developments (gas pipelines, incinerators, electrical cable routes, oil refineries and quarries) involving complex assessments as part of multi-disciplinary teams. Such projects include.

Dr Sheehy holds an Honours Degree (BSc) in Ecology and a PhD in ornithology/behavioural ornithology from UCC. She has 15 years' experience in ecological assessment and has prepared Screening/NIS for a range of small and large-scale projects with expertise in assessing impacts on birds. Dr Sheehy's PhD research focused on bird behaviour at airports, where she studied bird avoidance behaviour and collision risk to aircraft. Her research involved field observations, post-mortem analysis and radar surveys. She has worked on bird collision risk assessments at airports throughout Ireland including Dublin airport, Cork airport, Shannon airport and Kerry airport.

Dr Sheehy has prepared out field-based surveys and environmental reports including NIS, AA screening and EIARs. Notable projects include the Arklow Bank Wind Park, Indaver Ireland Waste Management Facility at Ringaskiddy, Irving Oil Whitegate Refinery, Shannon Liquefied Natural Gas Terminal and the Greenlink Interconnector.

8.2 Relevant Legislation & Guidelines

The general EIA legislation and guidance documents are listed in Section 1.5. The legislation and guidelines relevant to Water considered in the preparation of this Chapter include:

8.2.1 *Legislation*

8.2.1.1 European Legislation

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive);
- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (The Birds Directive);
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (The Water Framework Directive);
- Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life (The Fish Directive (consolidated)).

8.2.2 *Irish Legislation*

- The Wildlife Act 1976, as amended by the Wildlife Act 1976 (Protection of Wild Animals) Regulations, 1980, the Wildlife (Amendment) Act 2000, the Wildlife (Amendment) Act 2010, Wildlife (Amendment) Act 2012, European Communities (Wildlife Act, 1976) (Amendment) Regulations 2017. (The Wildlife Act);
- European Communities (Conservation of Wild Birds) Regulations 1985 (S.I. 291/1985) as amended by S.I. 31/1995;
- European Communities (Natural Habitats) Regulations, S.I. 94/1997 as amended by S.I. 233/1998 & S.I. 378/2005 (The Habitats Regulations);
- Fisheries (Consolidation) Act, 1959 (as amended), hereafter referred to as the Fisheries Act;
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011);
- Flora (Protection) Order, 2022 (S.I. No. 235/2022).

8.2.3 *Guidelines*

- Guidelines on Ecological Impact Assessment in the UK and Ireland, 2nd edition (Chartered Institute of Ecology and Environmental Management CIEEM 2016);
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, Version 1.1 (CIEEM, 2018);
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (European Union (EU), 2017);
- Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC (EC Environment Directorate-General, 2018);
- Guidance on integrating climate changes and biodiversity into environmental impact assessment (EU Commission 2013);

- Assessment of plans & projects in relation to N2K sites – Methodological Guidance (EC 2021);
- Biodiversity Net Gain Good practice principles for development (CIEEM 2019)
- Biodiversity Net Gain. A practical guide. (CIEEM 2016);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters Inland Fisheries Ireland (2016);
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC 2021);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority (NRA) 2009);
- Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011);
- A Guide to Habitats in Ireland (Fossitt, 2000);
- Guidelines for the treatment of Badgers prior to the construction of National Road Schemes. National Roads Authority, Dublin (National Roads Authority (NRA) 2005a);
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority (NRA) 2005b).
- Guidelines for the treatment of bats during the construction of national road schemes (National Roads Authority (NRA) 2005c);
- Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post construction of national road schemes. (National Roads Authority (NRA) 2006).
- Guidelines for the treatment of Otters prior to the construction of National Road Schemes (National Roads Authority (NRA) 2008);
- Bird Census Techniques (Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustoe, S.H. 2000)
- Bird Monitoring Methods - a Manual of Techniques for Key UK Species. (Gilbert, G., Gibbons, D.W. & Evans, J. (1998))
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed)' (Collins, 2016) and
- Bat Mitigation Guidelines for Ireland Volume 2. (F. Marnell, C. Kelleher and E. Mullen NPWS (2022))
- NRA (2008) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. NRA, Dublin.

8.3 Limitations

Standard survey methods were followed; however any biases or limitations associated with these methods could potentially affect the findings. Although every effort was made to provide a full assessment and comprehensive description of the study area, natural fluctuations in populations may not be fully reflected due to the instantaneous nature of the field surveys. However, the field surveys together with the background knowledge provided by a desk study, provides a robust representation

of the baseline for the habitats and species within the zone of influence (ZoI) of a proposed development site.

8.4 Methodology

The assessment was carried out in three stages:

1. Desktop study to determine existing information and records in relation to:

   - Sites, species, and habitats protected under the Habitats Directive and sites and species protected under the Birds Directive, within the ZoI of the proposed development and more distant hydrologically linked sites. The ZoI comprises the area within which the proposed development may potentially affect the conservation objectives (or qualifying interests) of a protected site, and

   - Biodiversity, habitats, and species present near the proposed development.

2. Site visits to establish the existing ecological conditions within the footprint of the proposed development and within the vicinity of all the proposed development elements.

3. Evaluation of the proposed development and determination of the scale and extent of potential likely direct and indirect significant effects on biodiversity (i.e., flora, fauna, and habitats) and the identification of appropriate mitigation and monitoring measures.

8.4.1 *Desk Top Study*

A desktop study was carried out to collate the available information on the local ecological environment. The purpose was to identify features of ecological value occurring within the proposed development site and those occurring near to it that have the potential to be affected by the proposed development. The desktop review allowed the key ecological issues to be identified early in the assessment process and facilitated the planning of surveys. The information sources included:

- National Parks and Wildlife Service (NPWS) - www.npws.ie
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre (NBDC) – www.biodiversityireland.ie
- Bat Conservation Ireland - www.batconservationireland.org
- Birdwatch Ireland - www.birdwatchireland.ie
- EPA Catchments Data https://www.catchments.ie
- South Dublin County Council Development Plan 2022-2026
- South Dublin County Council Planning Database

8.4.2 *Site Surveys*

A site surveys were carried out on the 9th November to identify the habitats, flora and fauna present at the site. The survey area included all lands within the proposed development site boundary.

- Habitats were mapped according to the classification scheme outlined in the Heritage Council Publication A Guide to Habitats in Ireland (Fossitt, 2000) and following the guidelines contained in Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011). Habitats were cross referenced with Habitats Directive Annex I habitats.

- The botanical survey, including a survey for invasive species, was conducted in-parallel with the habitats survey (Wyse *et al*., 2016; Stace 2019);

- A general bird survey was carried out (Gilbert *et al*. 1998 and Bibby *et al.* 2000) which aims to capture a snapshot of breeding bird activity within the survey area. The survey focused on terrestrial habitats within the planning boundary.. All species seen or heard in the survey area and immediate environs were recorded including those in flight. Visits were made during favourable weather conditions.

- General mammal surveys were conducted in conjunction with habitat surveys. These surveys focused on protected mammal species (Wildlife Act 1976, as amended) in particular on Badger *Meles meles* and Otter *Lutra lutra* and identifying potential habitat for bats (NRA 2005a, NRA 2005b, NRA 2005c, NRA 2008). Field signs of Badger are characteristic and sometimes quite obvious and include tufts of hair caught on barbed wire fences, conspicuous Badger paths, footprints, small excavated pits or latrines in which droppings are deposited, scratch marks on trees, and snuffle holes, which are small scrapes where Badgers have searched for insects and plant tubers. Otter survey methodology followed guidance outlined in NRA (2008) and included searches for breeding or resting sites within 150m of the proposed development site boundary.

The surveys were carried out in accordance with best practice and in the expert opinion of the authors, are considered sufficient to assess potential significant ecological effects associated with the project. Prior to the survey a literature review was completed for reference to the site and locality, as were the listings of sites of conservation importance in the locality held by the NPWS of the Department of the Environment, Heritage and Local Government (www.npws.ie).

8.4.3 *Evaluation of Ecological Receptors*

The potential effects of the construction, operation and decommissioning (where relevant) stages of a proposed development on biodiversity include:

- Potential Effects on Habitats;
- Potential Effects on Mammals;
- Potential Effects on Birds;
- Potential Effects on Amphibians and Reptiles;
- Potential Effects on Other Species;
- Potential Effects from Non-native Invasive Species;

- Potential Effects on Water Quality and Aquatic Ecology, and
- Potential Effects from Air Emissions

8.4.4 *Magnitude of Impacts*

When describing changes/activities and impacts on ecosystem structure and function, the important elements to consider are positive/negative, extent, magnitude, duration, frequency and timing, and reversibility.

8.4.5 *Significance of Impacts*

The EPA Guidelines (2022) states that the significance of effects is usually understood to mean the importance of the outcome of the effects and is determined by a combination of objective (scientific) and subjective (social) concerns. The Guidelines note w*hile guidelines and standards help ensure consistency, the professional judgement of competent experts plays a role in the determination of significance. These experts may place different emphases on the factors involved. As this can lead to differences of opinion, the EIAR sets out the basis of these judgements so that the varying degrees of significance attributed to different factors can be understood".*

With this in mind, the geographic frame of reference applied to determining impact significance by the NRA (2009) in Ireland and CIEEM (2019) in Ireland and the UK was used in this assessment in tandem with the EPA's qualitative significance criteria. Table 8.1 compares the qualitative versus geographic approaches to determining the significance of effects.

Table 8.1. Equating the Definitions of Significance of Effects Using a Geographic vs. Qualitative Scale of Reference

Geographic Scale of Significance **(NRA, 2009; CIEEM, 2019)**	**Qualitative Scale of Significance of Effects** **(EPA 2022)**
Negligible or Local Importance (Lower Value). No significant effects predicted to significant ecological features.	Imperceptible. An effect capable of measurement but without significant consequences. Not significant. An effect which causes noticeable changes in the character of the environment but without significant consequences.
Local Importance (Higher Value), County, National, Regional, or International.	Slight / Moderate / Significant / Very Significant / Profound i.e., effects can be slight, moderate, significant, very significant, or profound at Local scale, subject to the proportion of the local population/habitat area affected.

The geographic frame of reference is a 'good fit' for the assessments of biodiversity impacts because it allows clear judgements to be made about the scale of significance, with reference to published data for the population size of a given species at county, national and / or international scales or areas of habitats at such scales.

The proportion of a known feature impacted at county scale (i.e., 1% of the known or estimated population in a given county) is measurably different from that impacted at national scale (i.e., 1 % of the known or estimated national population).

A non-geographic qualitative approach can be a 'poor fit' to the assessment of biodiversity, since the definitions provided for the different qualitative terms do not relate to measurable units of space, such as a county or national boundary. For instance, a significant effect is defined by the EPA as "an effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment without affecting its sensitivities", while a very significant effect is that which "by its character, magnitude, duration or intensity significantly.

8.5 Proposed Development

Chapter 3 provides a detailed description of the proposed development. The elements relevant to Biodiversity include:

- Construction and operational stage disturbance (lighting, noise) to protected species inside and outside the site boundary;
- Construction and operational stage risks of contamination of surface water and potential impacts on designated sites of ecological importance.

8.6 Receiving Environment

8.6.1 *European (Natura 2000) Sites*

Special Areas of Conservation (SACs) and candidate SACs are protected under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites.

In accordance with the European Commission Methodological Guidance (EC 2018), a list of Natura 2000 Sites that can be potentially affected by the proposed project was complied. These are listed in Table 8.2 and their locations shown in Figure 8.1. Further information on these Natura 2000 is sites also provided below.

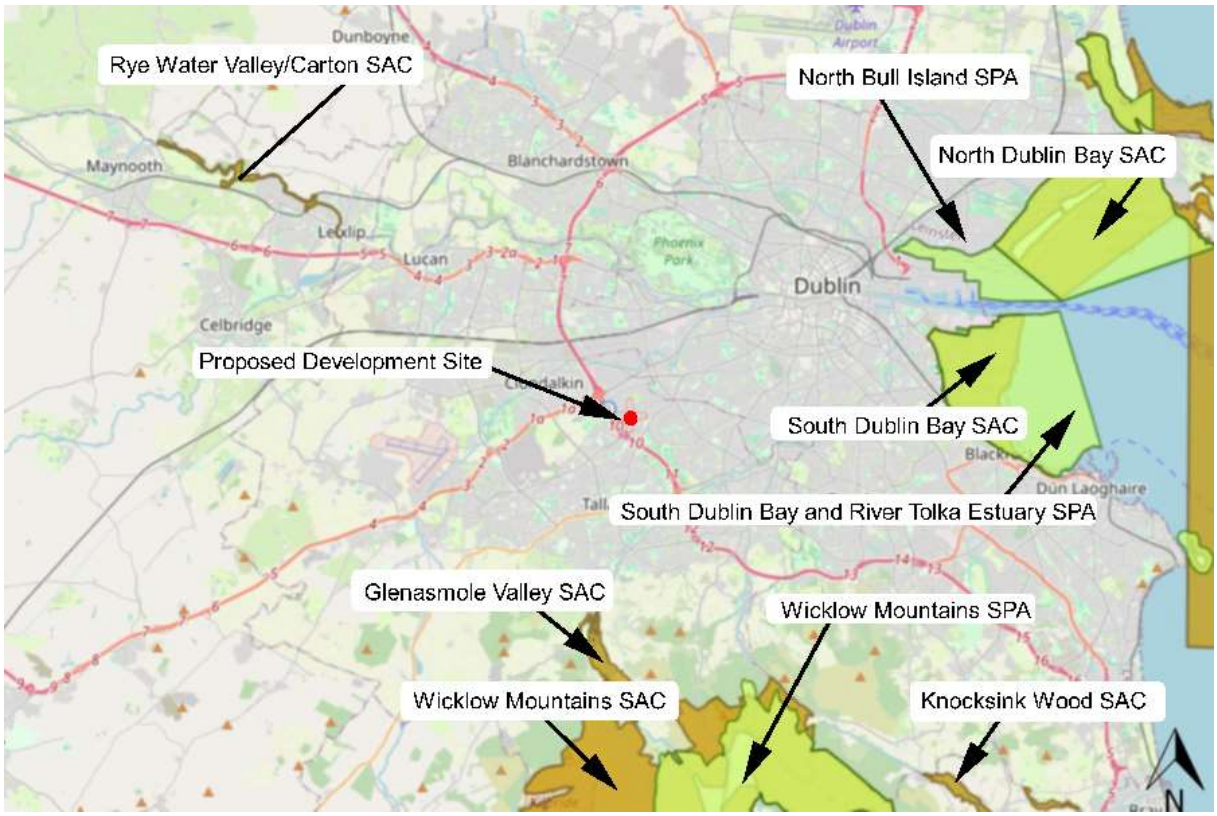

Figure 8.1 Natura 2000 Sites

The proposed development is not located within any Natura 2000 site. The Coolafan Stream, a 2nd order tributary of the River Liffey is located approximately 410m north of the proposed development site. This stream meets the waters of Dublin Bay approximately 14.7km downstream of the proposed development site at Ballymount. The South Dublin Bay and River Tolka Estuary SPA, South Dublin Bay SAC, North Dublin Bay SAC and North Bull Island SPA are located within Dublin Bay.

Surface waters generated during construction could potentially carry silt, hydrocarbons or other contaminants into either the local sewer network or the local surface water network which ultimately discharges to Dublin Bay. There is also a potential risk that surface waters may be contaminated as a consequence of groundwater discharges, as some localised contaminated land may be encountered. It is noted that there will be no process or wastewater emissions to water as part of the proposed development.

Therefore, a source-pathway-receptor link has been identified between the source (the proposed development) and the receptors (South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA) via a potential pathway (surface water run-off/discharges during construction/operation and the spread of invasive species).

Given the limited scale of the proposed development, the lack of a hydrological connection, the dilution provided in the estuarine/marine environment and the distances involved, no potential impact on other designated sites has been identified. Potential impacts on designated Natura 2000 sites (SAC/cSAC/SPA) are specifically addressed in the Report in Support of Appropriate Assessment (AA) screening submitted under separate cover with this application. The conclusions of the AA screening report noted the following: *The proposed development, either alone or in-combination with other plans and/or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives.*

Table 8.2 **European Sites**

Natura 2000 Sites	Site Code		Distance at closest point and potential source-pathway-receptor link
Special Area of Conservation (SAC)			
Glenasmole Valley SAC	001209	Habitats 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 7220 Petrifying springs with tufa formation (Cratoneurion)*	6.0km northwest. No hydrological or other pathway identified.
Wicklow Mountains SAC	001209	Habitats 3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) 3160 Natural dystrophic lakes and ponds 4010 Northern Atlantic wet heaths with Erica tetralix 4030 European dry heaths 4060 Alpine and Boreal heaths 6130 Calaminarian grasslands of the Violetalia calaminariae 6230 Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* 7130 Blanket bogs (* if active bog) 8110 Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) 8210 Calcareous rocky slopes with chasmophytic vegetation 8220 Siliceous rocky slopes with chasmophytic vegetation 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles Species 1355 Otter *(Lutra lutra)*	8.4km south. No hydrological or other pathway identified.
South Dublin Bay SAC	000210	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other	9.7km northeast. Although unlikely, a source-pathway-receptor link has been identified between the source (proposed development site) and the receptor (South Dublin Bay SAC) via a potential pathway (impacts on water quality and spread of invasive species

Natura 2000 Sites	Site Code		Distance at closest point and potential source-pathway-receptor link
		annuals colonising mud and sand 2110 Embryonic shifting dunes	during construction or operational phase).
Rye Water Valley/Carton SAC	001398	Habitats 7220 Petrifying springs with tufa formation (Cratoneurion)* Species 1014 Narrow-mouthed Whorl Snail *(Vertigo angustior)* 1016 Desmoulin's Whorl Snail *(Vertigo moulinsiana)*	8.0km west. No hydrological or other pathway identified
North Dublin Bay SAC	000206	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1410 Mediterranean salt meadows (Juncetalia maritimi) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with Ammophila arenaria (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* 2190 Humid dune slacks Species 1395 Petalwort *(Petalophyllum ralfsii)*	12.7km northeast. Although unlikely, a source-pathway-receptor link has been identified between the source (proposed development site) and the receptor (North Bull Island SAC) via a potential pathway (impacts on water quality and spread of invasive species during construction or operational phase).
Knocksink Wood SAC	000725	Habitats 7220 Petrifying springs with tufa formation (Cratoneurion)* 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*	14.7km southeast. No hydrological or other pathway identified

Natura 2000 Sites	Site Code		Distance at closest point and potential source-pathway-receptor link
Special Protection Area (SPA)			
Wicklow Mountains SPA	004040	Birds A098 Merlin *Falco columbarius* A103 Peregrine *Falco peregrinus*	9.0km south. No hydrological or other pathway identified
South Dublin Bay and River Tolka Estuary SPA	004024	Birds A046 Light-bellied Brent Goose *(Branta bernicla hrota)* A130 Oystercatcher *(Haematopus ostralegus)* A137 Ringed Plover *(Charadrius hiaticula)* A141 Grey Plover *(Pluvialis squatarola)* A143 Knot *(Calidris canutus)* A144 Sanderling *(Calidris alba)* A149 Dunlin *(Calidris alpina)* A157 Bar-tailed Godwit *(Limosa lapponica)* A162 Redshank *(Tringa totanus)* A179 Black-headed Gull *(Chroicocephalus ridibundus)* A192 Roseate Tern *(Sterna dougallii)* A193 Common Tern *(Sterna hirundo)* A194 Arctic Tern *(Sterna paradisaea)* Habitats Wetlands	9.8km northeast Although unlikely, a source-pathway-receptor link has been identified between the source (proposed development site) and the receptor (South Dublin Bay and River Tolka Estuary SPA) via a potential pathway (impacts on water quality and spread of invasive species during construction or operational phase).
North Bull Island SPA	004006	Birds A046 Light-bellied Brent Goose *(Branta bernicla hrota)* A048 Shelduck *(Tadorna tadorna)* A052 Teal *(Anas crecca)* A054 Pintail *(Anas acuta)* A056 Shoveler *(Anas clypeata)* A130 Oystercatcher *(Haematopus ostralegus)* A140 Golden Plover *(Pluvialis apricaria)* A141 Grey Plover *(Pluvialis squatarola)* A143 Knot *(Calidris canutus)* A144 Sanderling *(Calidris alba)* A149 Dunlin *(Calidris alpina)* A156 Black-tailed Godwit *(Limosa limosa)*	12.7km northeast. Although unlikely, a source-pathway-receptor link has been identified between the source (proposed development site) and the receptor (North Bull Island SPA) via a potential pathway (impacts on water quality and spread of invasive species during construction or operational phase).

Natura 2000 Sites	Site Code		Distance at closest point and potential source-pathway-receptor link
		A157 Bar-tailed Godwit *(Limosa lapponica)* A160 Curlew *(Numenius arquata)* A162 Redshank *(Tringa totanus)* A169 Turnstone *(Arenaria interpres)* A179 Black-headed Gull *(Chroicocephalus ridibundus)* Habitats Wetlands	

Therefore, a source-pathway-receptor link has been identified between the source (the proposed development) and the receptors (South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA) via a potential pathway (surface water run-off/discharges during construction/operation and the spread of invasive species).

Given the limited scale of the proposed development, the lack of a hydrological connection, the dilution provided in the estuarine/marine environment and the distances involved, no potential impact on other designated sites has been identified.

Potential impacts on designated Natura 2000 sites (SAC/cSAC/SPA) are specifically addressed in the Report in Support of Appropriate Assessment (AA) screening which has been submitted as part of this application. The conclusions of the AA screening report noted the following:

The proposed development, either alone or in-combination with other plans and/or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives.

8.6.2 *National Sites*

Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) are national designations under the Wildlife Act 1976, as amended. A Natural Heritage Area (NHA) is designated for its wildlife value and receives statutory protection. These areas are considered nationally important for the habitats present or which holds species of plants and animals whose habitats needs protection. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation.

The NHAs (pNHAs) located in the vicinity of the proposed development site are shown in Figure 8.2. While the proposed development site is located in proximity to a number of pNHAs. The proposed development site is not hydrologically connected to these sites. The Dodder Valley pNHA (site code 000991) is located approximately 2.8km south and the Grand Canal pNHA (site 002104) is located approximately 2km north. There is no hydrological or other connection between the proposed development site and any pNHA. Therefore, there is no viable pathway between the proposed development site and NHAs/pNHAs in the vicinity.

Figure 8.2 NHA in the Vicinity of the Proposed Development Site Source BBDC Mapping.

8.6.3 *Habitats*

Site surveys were carried out on the 9th November 2023. Habitat mapping was carried out in line with the methodology outlined in the Heritage Council Publication, *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). The terrestrial and aquatic habitats within or adjacent to the proposed development site were classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex I Habitats where required. The survey results are representative of the habitats within the application site and include the dominant and characteristic species of flora.

The ecological value of habitats has been defined using the classification scheme outlined in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009) which is in Appendix 8.1**.** It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape.

Habitats that are considered to be good examples of Annex I and Priority habitats are classed as being of International or National Importance. Semi-natural habitats with high biodiversity in a county context and that are vulnerable, are considered to be of County Importance. Habitats that are semi-natural, or locally important for wildlife, are considered to be of Local Importance (higher value) and sites containing small areas of semi-natural habitat or maintain connectivity between habitats are considered to be of Local Importance (lower value).

The habitats recorded onsite as well as their ecological value is detailed in Table 8.3. The proposed development site is within an existing industrial facility and is dominated by man-made habitats which are not of ecological value. There is some vegetation on the boundary of the site and on small unused corners of the site. No rare plant species were recorded within the works area during the site survey. Although the survey was conducted outside the main growing season the presence of rare or uncommon species is unlikely.

Table 8.2. Habitats within the Proposed Development Site

Habitat	Description	Habitat value (NRA Guidelines)
Treeline WL2/Hedgerow W1	There is a mixture of patchy treeline and some non-native hedging along some of the external boundaries of the existing facility. The trees are planted and along the Ballymount Road there is a mixture of dense Cherry Laurel and Norway Maple forming a coherent linear feature. The dense cherry laurel creates heavy shade and suppresses ground flora. Elsewhere there are more patchy lines of sycamore with some leylandii also present. Due to poor structure and dominance by non-native species this habitat is of low value.	Local importance (Lower Value)
Buildings and artificial surfaces BL3/recolonising bare ground ED3/Flower beds and borders BC4.	The site is dominated by artificial surfaces including roads, yards, the existing office building, areas of gravel and the existing waste management facility. Some early successional species have become established in small areas on the margins. Species noted include red fescue, cleavers, rosebay willowherb, prickly sow thistle, wild rose and spear thistle. There is some planted immature cherry laurel and pampas grass planted in managed beds. Buddliea is occasional.	Local importance (Lower value)
Dry meadow and grassy verge GS2/Scrub WS2	To the rear of the existing waste management building there is an areas of unused ground which has been colonised by a mixture of taller, coarse grasses and scrub. Species noted include Canadian fleabane, buddleia, bramble, nettle, woody nightshade, wild clematis with occasional immature sycamore. In the absence of active management this area will is expected to develop as an area of dense scrub	Local importance (Lower value)

8.6.4 *Flora*

No botanical species protected under the Flora (Protection) Order 2022, listed in Annex II or IV of the EU Habitats Directive (92/43/EEC), or listed as species of conservation concern in Ireland were recorded for the study site. All species recorded during the botanical survey are common.

8.6.5 *Invasive Species*

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features:

- Prolific reproduction through seed dispersal and/or re-growth from plant fragments;
- Rapid growth patterns; and
- Resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially:

- Out compete native vegetation, affecting plant community structure and habitat for wildlife;

- Cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and,

- Have an adverse effect on landscape quality.

Section 49(2)The Birds and Natural Habitats Regulations 2011 (SI 477 of 2011 prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed *Fallopia japonica*, as follows: "*any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence*."

No Third Schedule invasive species or species which are at risk of having damaging effects (Kelly *et al* 2013), were recorded within the proposed development site. The non-native invasive species Buddleia was recorded at the site. This species is not included in the Third Schedule of the Birds and Natural Habitats Regulations 2011 (SI 477 of 2011). Therefore, its presence at the site does not have the potential to lead to an offence under the Birds and Natural Habitats Regulations 2011 (S.I. 477 of 2011). However, Buddleia is classified as an Amber Threat species by Invasive Species Ireland which under the right ecological conditions may have a negative impact on native species or habitats.

8.6.6 *Fauna*

8.6.6.1 Bats

In Ireland, nine species of bat are currently known to be resident with the residency of the tenth recorded species yet to be proven. These are classified into two Families: the Rhinolophidae (Horseshoe bats) and the Vespertilionidae (Common bats). The lesser horseshoe bat *Rhinolophus hipposideros* is the only representative of the former Family in Ireland. All the other Irish bat species are of the latter Family and these include three pipistrelle species: common *Pipistrellus pipistrellus*, soprano *P. pygmaeus* and Nathusius' *P. nathusii*, four *Myotids*: Natterer's *Myotis nattereri*, Daubenton's *M. daubentonii*, whiskered *M. mystacinus*, Brandt's *M. brandtii*, the brown long-eared *Plecotus auritus* and Leisler's *Nyctalus leisleri* bats.

Whiskered and Natterer's bats are listed as '*Threatened in Ireland*', while the other species are listed as '*Internationally Important'* in the Irish Red Data Book 2: Vertebrates (Whilde, 1993). The population status of both Whiskered and Natterer's bats was considered '*indeterminate*' because of the small numbers known of each, a few hundred and approximately a thousand respectively. Ireland is considered to be an international stronghold for Leisler's bat, whose global status is described as being at '*low risk, near threatened*' (LR; nt) by the IUCN (Hutson, *et al*., 2001).

All bats are listed in Annex IV of the EU Habitats Directive. The domestic legislation that implements this Directive gives strict protection to individual bats and their breeding and resting places. It should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS.

The artificial habitats which dominate the site provide low value foraging habitat for bats and the proposed development will not impact on linear features with the potential to be of value as significant commuting routes. It is also noted that background levels of light deter some bat species. The trees within the site boundary lack potential roost features (PRFs) such as cracks and crevices or dense mature ivy. They are considered of negligible value for bats.

The office building is of modern construction with no wooden facias or other features that could provide bat roosting habitat. The windows and doors are of modern construction with no entry

entrance or exit points. Likewise the remaining buildings such as prefab offices and industrial buildings are of modern construction, are often open drafty and lack suitable structural elements for roosting bats. The site is considered of low to negligible value for bats.

8.6.6.2 Otter

Otters, along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Direct which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

Although rare in parts of Europe, they are widely distributed in the Irish countryside in both marine and freshwater habitats. Otters are solitary and nocturnal and as such are rarely seen. Thus, surveys for Otters rely on detecting signs of their presence. These include spraints (faeces), anal gland secretions, paths, slides, footprints, and remains of prey items.
There are no aquatic features within the site or in close proximity and habitat of value for otter was recorded.

8.6.6.3 Other Terrestrial Mammals

There is very little vegetation extant within the site boundary with the exception of some treelines dominated by non-native species and a small area of scrub. Levels of disturbance are high with significant numbers of traffic movement and relatively high levels of background noise. Although rodent species may occur and are controlled by rodenticides, no other protected mammals such as badger, stoat, hedgehog etc are likely to occur.

8.6.6.4 Amphibians and Reptiles

There are no aquatic or semi-aquatic habitats within the site boundary or in close proximity and therefore no habitat for Common Frog or Smooth Newt

8.6.6.5 Birds

Bird surveys were carried out on the 9th November 2023. There is no significant bird breeding habitat on site and specialised breeding bird surveys were not considered necessary. During the survey, all birds seen or heard within the development site boundary were recorded.

In general the site is of low value for terrestrial birds. Boundary habitats are dominated by introduced species which are of low value for birds and scrub is limited in extent. Levels of disturbance is high with ongoing traffic movement and pedestrian movement. Although a small number of species which are relatively common in the urban environment were recorded i.e. Blackbird, Rook, Starling, Robin, Blue Tit, Magpie, Jackdaw, in general the site is considered of negligible value for most bird species. It is noted that Starling is Amber list species of conservation concern in Ireland. However, the habitats at the site are unlikely to provide high value nesting or foraging habitat for this species.

The waste activities on site attract corvids and gull species 'checking' for foraging opportunities. During the survey most of the gulls were recorded roosting on the roof of an existing industrial building adjoining and to the west of the site. The following species were recorded 22 Black-headed gull, 35 Herring gull, 5 Lesser black backed gull and 5 Common gull) with smaller numbers nesting on the main waste hall (8 Herring gull, 2 Lesser black backed gull).

Overall, the proposed development site is of low local value for bird species that are relatively common in urban/suburban environments with very little nesting or foraging habitat available; however, waste activities at the site do attract gulls and corvids to the site.

8.6.6.6 Other Species

The site is dominated by common low value habitats and although some common invertebrates are likely to occur the present of rare or notable species is highly improbable.

8.7 Impacts Construction Stage

In the absence of mitigation measures, construction phase impacts have the potential to remove a range of habitats and disturb or displace protected species for the duration of construction. Significant potential impacts on biodiversity include habitat loss, noise and visual/light disturbance of protected fauna species, and the potential for suspended solids or other contaminants to impact on local watercourses/waterbodies.

8.7.1 *Habitats*

Potential impacts on habitats, are detailed in Table 8.4. It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape. The classification scheme, used in Table 8.3 for the value of habitats and the impacts on them, is detailed in the NRA publication *Guidelines for assessment of ecological impacts of National Road Schemes* (Appendix 8.1).

Table 8.4. Potential Impacts on Habitats

Habitat	Habitat value (NRA Guidelines)	Potential Impacts
Treeline WL2/Hedgerow W1	Local importance (Lower Value)	Negative. Not significant. Long-term impact
Buildings and artificial surfaces BL3/recolonising bare ground ED3/Flower beds and borders BC4.	Local importance (Lower value)	Negative. Not significant. Long-term impact
Dry meadow and grassy verge GS2/Scrub WS2	Local importance (Lower value)	Negative. Slight. Long-term impact

Impacts on terrestrial habitats are generally restricted to direct removal of habitats and possible impacts from the spread of invasive species. Indirect impacts may occur via damage and disturbance arising from vehicular activities and storage of overburden and materials. Levels of dust during construction are predicted to be low and effectively managed by mitigation. The impact on vegetation in adjoining habitats from wind-blown dust is predicted to be imperceptible. No rare floral species were recorded within the proposed development site.

Potential impact of the proposed development on qualifying habitats within Natura 2000 sites are discussed in the AA screening which accompanies this application. This report concluded that there will be no direct (or indirect) impacts on protected habitats as a result of the proposed development. As noted earlier there will be no direct or indirect impacts on habitats within NHAs or pNHAs as a result of the proposed development.

8.7.2 *Invasive Species*

No third schedule invasive species or species which are at risk of having damaging effects were recorded within the proposed development site. No precise studies have been done on the level of impact of Buddleia, likely due to its long history of naturalisation but it is likely to displace native plants where it is present. Mitigation measures have been specified in this Chapter to prevent the spread of this species during construction works.

8.7.3 *Mammals*

8.7.3.1 Bats

The site is dominated by habitats of very low potential value for bats and background levels of lighting and disturbance are high. Noise and lighting during construction has the potential to impact on foraging bats. However, construction works will be confined to daytime hours and therefore disturbance from lighting will be imperceptible.

Overall, the loss of habitat and increased lighting and disturbance during construction will not have a significant impact on bats. The impact on foraging bats from habitat loss and construction activities will be negative, not significant and long term at a local geographic level.

8.7.3.2 Otter

No signs of Otter were recorded within 150m of the proposed development. During the construction phase noise and disturbance levels will increase. It is noted that construction works will primarily take place during daytime hours which will avoid the largely nocturnal foraging habits of Otter. No impacts on otter will occur.

8.7.3.3 Other Mammals

No other protected mammal species were recorded at the proposed development site.. Effects on mammals during construction due to loss of habitat, increased noise and disturbance and lighting are predicted to be negative, not significant and short-term at a local geographic level in the absence of mitigation.

8.7.3.4 Birds

The most significant impacts on breeding birds will be direct impacts during the construction phase through habitat loss, fragmentation and modification. In the absence of mitigation vegetation removal could result in injury to eggs, young and nests. However, it is noted that existing trees at the site will be largely retained.

During the construction phase it is expected that there will be indirect impacts due to disturbance of the site which is likely to displace foraging and breeding birds. During construction works, noise levels will fall off quickly outside the site boundary even during peak construction works. As noted above, considerable numbers of corvids and gulls were recorded roosting at the site. Any birds which roost

here are already habituated to considerable disturbance from the operation of the existing facility and are likely to readily habituate to any construction activity.

In the absence of mitigation, potential impacts include disturbance and injury to eggs, young and nests, and long-term loss of potential nesting sites and foraging habitat. Overall the impact on breeding birds is likely to be negative, slight and short-term at a local level in the absence of mitigation.

8.7.4 *Amphibians & Reptiles*

There is no habitat for amphibians or reptiles with the site or in close proximity. No signs of amphibians or reptiles were recorded and no impact on this species is predicted to occur.

8.7.5 *Other Species*

The habitats to be affected support common species of invertebrates and there is no evidence to indicate that the proposed development site is of particular value for other species in the context of the surrounding countryside. No significant effects on invertebrate species have been identified.

- *Water Quality & Aquatic Ecology*

There are no watercourses located in the vicinity of the site. The closest watercourse is the Ballymount Stream located c.410m north of the site. Existing surface water from the site is discharged under licence to the local surface water network.

In the absence of mitigation, there is the potential for spills/leaks to occur in areas where polluting substances (e.g. oils) are handled and when refuelling mobile plant that could infiltrate the soils and migrate to the water table. However, these is no direct pathway for impact on local surface waters.

8.7.6 *Air Emissions*

No significant emissions to air will occur during construction.

8.8 **Impacts Operational Stage**

8.8.1 *Habitats*

No significant operational impacts on habitats have been identified.

8.8.2 *Invasive Species*

No impacts will occur.

8.8.3 *Mammals*

8.8.3.1 Bats

Increased activity and human presence, noise and artificial lighting may impact and disturb or displace bats during the operational phase of the proposed development. The proposed development is located within an existing industrial facility and there will be no significant change toe bassline lighting.

The habitats within the proposed development site are of low to negligible value for bats. The planting proposed as the site, as part of the landscape plan will use native tree species. Linear planting along

the boundary of the site is likely to create new foraging areas of bats as this habitat matures. The impact on bats is predicted to be neutral, imperceptible and long-term.

8.8.3.2 Otter

Increased activity and human presence, noise and artificial lighting may impact and disturb or displace Otter during the operational phase of the proposed development, including light spillage onto previously unlit boundary habitats. No signs of Otter were recorded these is habitat for this species within or in close proximity to the site. No impact on this species will occur during operation.

8.8.3.3 Other Mammals

Increased activity and human presence, noise, fencing and additional lighting may disturb or displace other mammal species from favoured foraging habitats during the operational phases of the proposed development. However, there is no habitat for other protected mammals within or in close proximity to the site. No impact on these species will occur during operation.

8.8.3.4 Amphibians & Reptiles

There will be no impact on amphibians and reptiles.

8.8.4 *Birds*

Small areas of boundary habitat removed during construction works will be replaced by areas of native boundary planting. As this matures, it will provide nesting and foraging habitat for common terrestrial bird species.

During operation, gulls and corvids are likely to continue to visit the site and no impact on these species is predicted to occur.

The impact on birds during operation is predicted to be neutral, imperceptible and long-term at a local level.

8.8.5 *Other Species*

The habitats that will be affected support common species of invertebrates and there is no evidence to indicate that the development site is of particular value for other species in the context of the surrounding countryside. No significant effects on invertebrate species have been identified.

8.8.6 *Water Quality & Aquatic Ecology*

In the absence of mitigation, there is the potential for accidental spills to occur during filling of the diesel storage tank and the refuelling of the mobile plant which could infiltrate to ground through damaged paving. There is also the potential for minor oil leaks through damaged paved areas and leaks from the foul sewers to infiltrate to ground and groundwater. However, given the distance from aquatic receptors, no impact on watercourses or aquatic species are predicted to occur.

8.8.7 *Air Quality*

The assessment of the impacts of the proposed development on air quality has concluded that in relation to ecological sites the impact will be negative, imperceptible, local, likely and long-term.

8.8.7.1 Fire

In the event of a fire, which is the 'worst case' there may be damage to the landscape areas and trees inside the site boundary; however these are low ecological value habitats and readily replaced.

8.9 Likely Future Receiving Environment

In the absence of development, there would be no significant changes in the distribution of habitats. Some increase in scrub may occur over time.

8.10 Prevention and Mitigation

8.10.1 *Design Stage*

The landscape design approach was to retain the existing trees and hedgerows on the boundary wherever possible. A detailed landscape plan has been prepared and it includes the planting of native shrub species to compensate for the loss of the trees in the hedgerow/treeline

8.10.1.1 Lighting

The lighting scheme will be designed to minimise the impact of external lighting upon bat populations by retaining dark areas around the external boundaries. The scheme will optimise the lighting configuration to achieve recommended illuminance levels, while minimising light spill through a combination of column location and height, luminaire wattage and optical setting.

8.10.1.2 Fire Safety

The fire safety measures included in the design to mitigate the risk of fire outbreak are described in Section 10.8.1.6.

8.10.2 *Construction Stage*

It is essential that all construction staff, including all sub-contracted workers, are informed of valuable habitats and made aware that no construction waste of any kind (rubble, soil, etc.) is to be deposited in these areas and that care must be taken with liquids or other materials to avoid spillage.

All staff and subcontractors will be responsible for:

- Understanding the importance of avoiding pollution onsite, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Responding in the event of an incident to avoid or limit environmental impact, and
- Monitoring the workplace for potential environmental risks and alert the site manager if any are observed.

A CEMP has been prepared for proposed development and a copy is in Appendix 3.3. It contains all of the mitigation measures to prevent and mitigate impacts on Land, Water, Air and Human Health, all of which are also directly relevant to Biodiversity. Additional biodiversity mitigation measures are set out below.

8.10.2.1 Habitats and Floral Species

The Wildlife Act 1976, as amended, provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land or such growing in any hedge or ditch from the 1 March to the 31 August. Exemptions include the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. Where possible trees will be removed outside this period.

Trees will be protected in accordance with BS: 5837:2012 Trees in relation to design, demolition and construction. Recommendations and any further agreed procedures. The reinstatement of trees and vegetation will be undertaken by a suitably qualified landscape contractor as outlined in the landscape plan provided by Hayes Ryan Architects.

8.10.2.2 Bats

As a biodiversity enhancement measure it is proposed that bat boxes will be put up within the study area. It is proposed that four bat boxes will be located within the site (https://www.wildcare.co.uk/vincent-pro-bat-box-10651.html for box proposed or similar). The location will be specified by an ecologist taking into account landscape plans, vehicle movements and lighting.

8.10.2.3 Birds

As noted above vegetation will be removed outside of the breeding season where possible and in particular, removal during the peak-breeding season (April-June inclusive) will be avoided. This will also minimise the potential disturbance of breeding birds outside of the study area boundary.

8.10.2.4 Invasive Species

As Buddleia is a plant that favours disturbed sites, physical grubbing of plants can provide ideal conditions for the germination of seeds. Care needs to be taken to ensure revegetation of controlled areas is undertaken swiftly. The branches of buddleia are capable of rooting as cuttings, so care should also be taken to ensure material is disposed of in a manner to avoid this risk. Because stem and root fragments readily regenerate, debris piles should be burned, composted or otherwise treated in such a way to kill all seeds, stems and root fragments. Care must be taken when treating plants that are emerging from existing masonry and structures.

A number of different methodologies employed to treat Buddleia are summarised below. These include the following:

Physical/Mechanical control

Physical removal on a small spatial scale may help in the early stages of invasion. Young shrubs can be dug up, but this method is not recommended for mature plants. Hand-picking of young plants is feasible.

During the physical removal of the species care should be taken to avoid soil disturbance which can give rise to a flush of new seedling. Grubbing of mature stands as a sole attempt at control is not recommended for the same reason. After uprooting, it is essential to plant the ground in order to prevent a flush of new seedling growth. Remaining stumps should be treated with an herbicide.

Movement Control

Dead-heading is the recommended method to reduce the spread of the species by seed. In particular, where the removal of mature plants is not feasible in the short term, the flower heads should be cut off in June before seed set.

Chemical Control

Recommended practice for the application of herbicides requires cutting back of plants to a basal stump during active growth (late spring to early summer) which is then treated (brushed on) immediately with a systemic weed killer mix (Starr et al, 2003). Foliar application of triclopyr or glyphosate may be adequate for limited infestations of younger plants but should be followed up at 6 monthly intervals. Direct and precise application, such as painting cut stumps or inject/plug herbicide into the plant is more effective than spraying (Ream, 2006; Zazirska and Altland, 2006).

8.10.2.5 Lighting

Lighting associated with the site works could cause disturbance/displacement of fauna. If of sufficient intensity and duration, there could be impacts on reproductive success. Site lighting will typically be provided by tower mounted temporary portable construction floodlights.

The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. Lighting mitigation measures will follow Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers (Bat Conservation Ireland, 2010). The following measures will be applied in relation to construction works lighting:

8.11 Monitoring

8.11.1 *Construction Stage*

Monitoring is not required.

8.11.2 *Operational Stage*

The inspection regimen referenced in the Landscape Management Plan will be implemented.

8.12 Cumulative Effects

Cumulative impacts on fauna chiefly relate to increased noise and activity levels and potential impacts on water quality. In-combination impacts from noise/disturbance are likely to be most pronounced during construction. This is a short-term impact which will be localised. During operation, only a slight localised increase in traffic and noise is predicted. As this proposed development is not predicted to significantly increase long term noise and disturbance levels or impact significantly on water quality, no significant cumulative impacts have been identified.

8.13 Residual Impacts

8.13.1 *Habitats*

Retention of the majority of treelines at the site as well as the proposed landscaping plan will provide foraging and commuting habitat for birds, bats and other fauna. There will be a loss of low value

habitats i.e. buildings and artificial surfaces, recolonising bare ground, non-native flower beds and some scrub. This will have a negative, imperceptible and long-term local impact.

8.13.2 *Invasive Species*

Following the implementation of mitigation measures, there will be no residual impact from the spread of invasive species.

8.13.3 *Water Quality*

There will be no emissions to on or off-site water features and therefore no impacts on surface waters. There is the potential for accidental spills of polluting materials to occur; however the mitigation measures specified in the CEMP will minimise the associated impacts.

Rainwater run-off that is not harvested and infiltrated to ground will discharge to the Uisce Eireann storm sewer. The flow rate will be restricted to greenfield rates. The EPA licence will specify emission limit values for the discharge to the sewer designed to prevent pollution of the Uisce Eireann storm sewer and will require routine monitoring to confirm compliance with the limits.
No residual impacts on downstream aquatic receptors have been identified.

8.13.4 *Air Quality*

The implementation of the CEMP will ensure that the impact construction activities on air quality be negative, imperceptible, localised and temporary. In the operational stage the impacts will be negative, not significant, localised, likely and long term. There will be no significant residual impacts on sensitive ecological receptors.

8.13.5 *Mammals*

No habitat of significant value for protected mammals including otter and bats will be affected by the proposed development. Following mitigation measures, residual impacts on mammals, will be negative, not-significant and long-term

8.13.6 *Birds*

No habitat of significant value for birds will be affected by the proposed development. Roosting gulls and corvids are habituated to the existing industrial activities onsite and are unlikely to be affected. Following mitigation measures (including landscape planting), residual impacts on birds, will be negative, not-significant and long-term.

8.13.7 *Other Species*

Following mitigation measures, residual impacts on other species, including fish and aquatic invertebrates, will be negative, imperceptible and long-term.

8.13.8 *Summary of Residual Impacts*

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Habitats	Negative	Imperceptible	Local	Likely	Long Term

Mammals	Negative	Not Significant	Local	Likely	Long Term
Birds	Negative	Not Significant	Local	Likely	Long Term
Other Species	Negative	Imperceptible	Local	Likely	Long Term

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9. AIR

9.1 Introduction

This Chapter describes the ambient air quality and the impacts of the proposed development on air quality in the receiving environment including a 'baseline' scenario. It focuses on the local environment in the vicinity of the proposed development, referred to in this chapter as the' study area'. It identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the potential impacts and assesses the residual potential impacts.

The Chapter was prepared by Dr. Micheal Fogarty and Mr. Simon Welchman of Katestone. Dr Fogarty is a Senior Air Quality Consultant with 13 years of experience in Ireland and Australia. He holds a B.Eng, M.Eng and PhD from the UCD College of Engineering and Architecture. He specialises in the areas of air quality and odour impact assessment. Mr. Welchman has been a director of Katestone since 2004 with more than twenty-nine years of experience working as an air quality expert in the private sector and for the environmental regulator.

9.2 Relevant Legislation & Guidance

The general EIA guidelines and legislation are listed in Section 1.59and the specific legislation and guidelines relevant to air quality that set out the general principles and suitable methods to complete the air quality assessment taken into account in the preparation of this Chapter are:

- Air Pollution Act 1987, as amended.
- Environmental Protection Agency Acts 1992, as amended
- Air Quality Standards Regulations 2011 (S.I. No. 180 / 2011), as amended.
- The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC).
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- EPA (2020) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4).
- NRA (2011) Treatment of Air Quality During the Planning and Construction of National Road Schemes.
- UK Highways Agency (2019) Design Manual for Roads and Bridges - Sustainability & Environment Appraisal- Air quality - LA 105.
- NRA (2008) Environmental Impact Assessment of National Road Schemes – A Practical Guide.
- Institute of Air Quality Management (IAQM) (2014) Guidance on the assessment of dust from demolition and construction.
- DEHLG (2004) Quarries and Ancillary Activities Guidelines for Planning Authorities.

- Environmental Management Guidelines – Environmental Management in the Extractive Industry (EPA 2006).

9.3 Methodology

The assessment was based on data derived from ambient air quality databases maintained by the EPA collected at the nearest ambient monitoring station, the results of dust deposition monitoring carried out in compliance with the current EPA licence and an odour impact and air quality modelling assessment completed by Katestone.

9.3.1 *Air Quality Information Sources*

The following sources were used in the preparation of this air quality assessment:

- EPA (2019) Air Quality in Ireland 2019 – Indicators of Air Quality;
- EPA (2020) Air Quality in Ireland 2020 – Indicators of Air Quality;
- EPA (2021) Air Quality in Ireland 2021 – Indicators of Air Quality;
- Met Éireann (2022) meteorological monitoring data.

9.3.2 *Assessment of Construction Impact*

The National Road Authority (NRA) guidance document titled Treatment of Air Quality During the Planning and Construction of National Road Schemes (NRA, 2011) addresses the potential impacts of construction activities on local air quality. It states *"The potential impact of both dust and vehicle emissions during the construction phase should be considered within the EIS. Dust emissions can lead to elevated PM_{10} and $PM_{2.5}$ concentrations and may also cause dust soiling."* The predominant emission of concern in the construction stage will be dust.

The DEHLG guidance document Quarries and Ancillary Activities Guidelines for Planning Authorities, states that *Residents living in proximity to quarries can potentially be affected by dust up to 0.5km from the source, although continual or severe concerns about dust are most likely to be experienced within about 100m of the dust source.*

The Institute of Air Quality Management (IAQM) 2014 Guidance provide guidance on how to undertake a construction impact assessment (including demolition and earthworks as appropriate). It describes a stepped assessment procedure to consider potential impacts. Katestone considers the methodology described in IAQM Guidance to be the most comprehensive and robust guidance for the assessment of impacts during the construction stage of proposed developments and adopted this approach.

Step 1 is to determine the likelihood of significant impacts based on the distance between the works and sensitive receptors, both human and ecological. If there are no receptors within the specified distance of the works then no further assessment is required. If there are receptors within the specified distances then a more detailed assessment of the dust impacts (Step 2) is required.

This Step applies to four activities (demolition; earthworks; construction; and track out) and takes account of the scale and nature of the works, which determines the potential dust emission magnitude (Step 2A); and the sensitivity of the area (Step 2B). These factors are combined in Step 2C to establish the risk of dust impacts.

Step 3 is to determine the site-specific mitigation for each of the four activities listed in Step 2. Step 4 is to examine the residual effects and to determine whether or not these are significant and Step 5 is the preparation of the dust assessment report.

The Step 1 screening criteria that trigger the Step 2 assessment are:

- a 'human receptor' within:
    - 350 m of the boundary of the site; or
    - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)

- an 'ecological receptor' within: - 50 m of the boundary of the site; or
    - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts are determined using four risk categories: negligible, low, medium and high risk. A site specific risk category is based on two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large (Step 2A); and

- The sensitivity of the area to dust impacts (Step 2B), which is defined as low, medium or high sensitivity.

The two factors are combined in Step 2C to determine the risk of dust impacts with no mitigation applied. The parameters used to characterise each construction activity and the limits used to define the extent of the activity in Step 2 are in Table 9.1. The sensitivity of an area to dust impacts (Step 2B) is dependent on:

- The type of receptors (human health and dust soiling impacts);
- The number of receptors in a potentially affected area (human health and dust soiling impacts);
- The distance of the receptors from the source of emissions or if known, from the dust generating activities (human health and dust soiling impacts), and
- Background levels of PM_{10} (human health impacts only).

The classification of areas with high sensitivity, medium sensitivity and low sensitivity based on the type of receptors is presented in the following tables:

- Table 9.2 for Dust Soiling Effects
- Table 9.3 for the Health Effects of PM_{10}.

Once the type of receptors has been determined, the sensitivity of an area to dust impacts (Step 2B) is determined by combining this information with the number of receptors in a potentially affected area, the distance of the receptors from the source of emissions or if known, from the dust generating activities and background levels of PM_{10} (human health impacts only) using the frameworks described in the following tables:

- Table 9.4 for Dust Soiling Effects on People and Property
- Table 9.5 Human Health impacts from Emissions of PM_{10}.

Table 9-1 Parameters Used to Characterise Each Construction Activity

Activity	Parameter	Parameter unit	Categories - Scale of activity		
			Small	Medium	Large
Demolition	Total building volume	m^3	<20000	20,000 - 50,000	>50000
Earthworks	Total site area	m^2		2,500 – 10,000	>10,000
Construction	Total building volume	m^3	<25,000	25,000 – 100,000	>100,000
Track out	HDV (>3.5t) outward movements	movements/day	<10	10 - 50	>50

Table 9-2 Indicative Examples Used to Characterise Location Sensitivity to Dust Soiling Effects

Receptor sensitivity	Indicative examples listed in IAQM (2014)
High sensitivity receptor	Dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms
Medium sensitivity receptor	Parks and places of work
Low sensitivity receptor	Playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.

Table 9-3 Indicative Examples Used to Characterise Location Sensitivity to the Health Effects of PM_{10}

Receptor sensitivity	Indicative examples listed in IAQM (2014)
High sensitivity receptor	Residential properties. Hospitals, schools and residential care homes
Medium sensitivity receptor	Office and shop workers
Low sensitivity receptor	Public footpaths, playing fields, parks and shopping streets

Table 9-4 Framework to Determine the Sensitivity of an Area to Dust Soiling Effects.

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10 -100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 9-5 Framework to Determine the Sensitivity of a Location to Human Health Impacts from Emissions of PM_{10}

Receptor Sensitivity	Annual Mean PM_{10} concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m³	>100	High	High	High	Medium	Low
		10 -100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28-32 µg/m³	>100	High	High	Low	Low	Low
		10 -100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24-28 µg/m³	>100	High	Medium	Low	Low	Low
		10 -100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	<24 µg/m³	>100	Medium	Low	Low	Low	Low
		10 -100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1 - 10	Medium	Low	Low	Low	Low
Low	-	>10	Low	Low	Low	Low	Low

Step 2C combines the sensitivity of an area and the magnitude of dust emissions to determine the risk of dust impacts which is established separately for demolition, earthworks, construction and track out. The frameworks used to determine the risk of dust impacts is presented in:

- Table 9.6 for Demolition Activities
- Table 9.7 for Earthwork and Construction Activities
- Table 9.8 for Track out Activities.

Step 3 determines the site-specific mitigation measures based on the risk categories for each of the four activities. The final step (Step 4) is to determine whether there are significant effects arising from the construction stage. Significance is only assigned to the effect after consideration of the mitigation measures.

Table 9-6 Framework To Determine The Risk Of Dust Impacts - Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 9-7 Framework To Determine The Risk of Dust Impacts – Earthworks/Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 9-8 Framework used to determine the risk of dust impacts - track out

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

9.3.3 *Assessment of Operational Impacts*

The sources of emissions in the operational will include emissions of odour from the exhaust stack of the OCU and exhaust gas emissions from road transport associated with hauling material to and from the proposed development.

9.3.3.1 Odour

The methodology is based on a dispersion modelling study incorporating source characteristics and operational activity data with meteorological data that is representative of the site and surrounding region. The assessment was in accordance with industry standards, regulatory requirements and best practice approaches and included:

- Selection of relevant odour assessment criteria.
- Derivation of an odour emissions rate for the OCU stack based on its air flow capacity and manufacturer's design odour emission limit.
- Characterisation of meteorological conditions in the region and generation of a representative meteorological dataset using observations from Casement Aerodrome, Dublin.
- Dispersion modelling using the regulatory dispersion model, AERMOD, to predict ground-level concentrations of odour across a Cartesian grid that covers the study area and at the closest sensitive receptor locations to the site boundary.
- Comparison of the predicted ground-level concentrations of odour against the relevant odour assessment criterion.

Meteorological Data

The EPA's Air Dispersion Modelling Guidance Note (AG4) (EPA, 2020) states:

> "*The dispersion process is dependent on the underlying meteorological conditions and ensuring that the air dispersion model includes representative meteorological data is critical....The USEPA (24) has defined meteorological representativeness as: "the extent to which a set of {meteorological} measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application"...and has expanded on this definition by outlining the factors to consider in the selection of appropriate meteorological data:*
>
> - *Proximity of the meteorological station to the modelling domain;*
> - *The complexity of the terrain;*
> - *The exposure of the meteorological monitoring site;*
> - *The period of time during which data is collected."*

Data gathered at Met Eireann's meteorological observation station at Dublin Airport is likely to be representative of meteorological conditions at the Site as defined in EPA's Air Dispersion Modelling Guidance Note (AG4).

AERMET is a general-purpose meteorological pre-processor for organizing meteorological data into a format suitable for use by the AERMOD air quality dispersion model. The AERMET meteorological pre-processor was configured with surface data from Dublin Airport and upper air data from Castor Bay, Co. Down and used to generate a meteorological file suitable for use in the AERMOD dispersion model.

AERMET requires inputs of roughness length (Z_o), Bowen ratio and Albedo. The AERMET User's Guide stipulates that Z_o should be determined based on land cover within a 1.0 km radius of the meteorological site. If the value of Z_o varies significantly by direction, then sector dependency should be used. Sector width should be >= 30°. The Bowen ratio and Albedo should be determined based on land cover within a 10 km x 10 km domain. A simple unweighted mean has been used for the Albedo and a weighted geometric mean for the Bowen ratio as required by the AERMET User's Guide. The approach to determining these parameters is described in Appendix 9.1.

Dispersion Modelling

The dispersion modelling was conducted in accordance with recognised techniques specified in EPA's AG4 document (EPA, 2020). AERMOD was used to predict ground-level concentrations of odour across the model domain due to emission sources at the site for five years of meteorological data. The modelling assumed that emissions occur 24 hours each day, for all hours of each modelled year.

Building Downwash

When modelling emissions from an industrial installation it should be borne in mind that stacks that are relatively short can be subjected to additional turbulence due to the presence of nearby buildings. Buildings are considered nearby if they are within five times the lesser of the building height or maximum projected building width (but not greater than 800m) (EPA, 2020).

The plume from a short stack is likely to be down washed if its height is less than two and a half times the height of nearby buildings within a distance of 10 x L from each source, where L is the lesser of the height or width of the building. A Building Profile Input Program (BPIP) was used to determine the effects of buildings at the site on the point sources of emissions. The Plume Rise Model Enhancements (PRIME) algorithm is recommended in EPA Guidance for use with AERMOD. PRIME was used in the dispersion modelling assessment to determine the effect of building induced turbulence on plumes from point sources at the proposed development.

The PRIME algorithm takes into account the position of each stack relative to each relevant building and the projected shape of each building for 36 wind directions (at 10º intervals). The model determines the change in plume centre-line location with downwind distance based on the slope of the mean streamlines and coupled to a numerical plume rise model.

Proposed Development

Three buildings/structures were included in the BPIP program to represent buildings and structures at the MRF. The coordinates used in the configuration of the onsite buildings and structures in the BPIP program are presented in Table 9-9.

Table 9-9 The Buildings and Structures and Configuration of the Proposed Development in BPIP

Building	Easting	Northing	Height (m)
	UTM (m)	UTM (m)	
Main Building Side Section	676,155	5,910,222	13.301
	676,182	5,910,246	
	676,191	5,910,235	
	676,164	5,910,212	
Main Building	676,122	5,910,250	13.301
	676,195	5,910,311	
	676,200	5,910,307	
	676,204	5,910,311	
	676,216	5,910,297	
	676,150	5,910,218	

Sensitive Receptors

The sensitive receptors that are of interest in relation to odour emissions from the proposed development include:

- Residential locations located south east and northeast of the site boundary, and
- Industrial and commercial units located in the industrial areas surrounding the site, especially those in the immediate vicinity of the site boundary

Odorous emissions will be treated in the OCU adjacent to the main building. The closest sensitive odour receptors are presented in Figure 9 6.

The closest residential receptor is approximately 40 m south east of the site boundary. Further sensitive residential receptors are located approximately 500 m south and 800 m east of the site.

The closest sensitive commercial and industrial receptors are:

- Adjacent to the northwest site boundary and 50 m west of the OCU Stack
- Adjacent to the south-eastern site boundary and 60 m southeast of the OCU Stack

The closest sensitive residential receptor and sensitive industrial and commercial receptors have been included in the dispersion modelling assessment. It can be inferred from the proximity of these receptors to the site boundary the if the air quality and odour levels are within relevant limits at these locations that compliance will also be achieved at locations further from the site.

Source Configuration

The parameters used to characterise the OCU stack in the dispersion modelling assessment are presented in Table 9-100.

Table 9-100 Source Parameters for the OCU Stack at the MRF as Modelled

Source Name	Location		Diameter	Height	Temperature	Velocity
	Easting	Northing				
	m	m	m	m	°C	m/s
OCU Stack	676,224	5,910,284	0.8	15.3	15	18.4

Emissions

The odorous waste streams will be handled and processed in the MSW / Brown Bin Bay in the MRF. The Bay will be maintained under negative air pressure with air being treated in an odour control unit (OCU) and vented through an elevated odour exhaust stack located on the western side of the building.

Negative pressure will be maintained in the Bay by:

- Having a well-sealed building, and
- Exhausting air to the OCU at a rate that results in two (2) air changes per hour inside the MSW/Brown Bin Bay.

The OCU will be designed to have a maximum exhaust concentration of odour of 800 ou_E/m^3.

The odour emission rate adopted in the assessment was calculated as the product of the maximum exhaust concentration of odour of the OCU and the design air flowrate of the extraction system. The values used to determine the odour emission rate adopted in the modelling assessment are presented in Table 9-11.

Table 9-11 Odour Emission Rate Modelling Assessment for the OCU Stack

Parameter	Value	Unit	Comment/Reference
Building Volume	16,672	m^3	Confirmed by O'Callaghan Moran
Air Changes Per Hour	2		Confirmed by O'Callaghan Moran
Air Flowrate	33,343	m^3/h	Calculated
Air Flowrate	9.3	m^3/s	Calculated
Stack Diameter	0.8	m	Confirmed by O'Callaghan Moran
Stack exhaust velocity	18.4	m/s	Calculated based on assumed diameter
Modelled Odour Concentration	800	ou_E/m^3	Odour concentration limit for the OCU
Stack Odour Emission rate	7,410	ou_E/s	Calculated

9.3.3.2 Traffic

Road transport associated with a development can be the source of emissions of several air pollutants, which are also produced by a wide range of industrial, commercial and domestic processes. The pollutants of most concern near roads are nitrogen dioxide (NO_2) and particles (PM_{10}) in relation to human health and oxides of nitrogen (NO_x) in relation to vegetation and ecosystems.

The assessment of potential transport related air quality impacts from the proposed development was conducted using the screening method set out in the Design Manual for Roads and Bridges (DMRB) (Highways England, 2019).

The DMRB provides a framework for assessing, mitigating and reporting the effects of motorway and all-purpose trunk road projects on air quality by determining whether the impacts of a project on human health or designated habitats can trigger a significant air quality effect. Part LA105 sets out the requirements for assessing and reporting the effects of highway projects on air quality (Highways England, 2019). It includes assessment methodologies to consider the impact of traffic emissions on human health and ecological sites, including the health of protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity.

The methodology includes a scoping approach to determine whether the air quality impacts of a project can either be scoped out, or require an assessment based on the changes between the' do something' traffic (with the project) compared to the do minimum traffic (without the project). If a project triggers the traffic scoping criteria, either a simple or detailed assessment shall be required.

The scoping criteria used were:

1) annual average daily traffic (AADT) >=1,000; or
2) heavy duty vehicle (HDV) AADT >=200; or
3) a change in speed band; or
4) a change in carriageway alignment by >=5m

The network of all roads that trigger the traffic screening criteria and adjoining roads within 200m is defined as the affected road network (ARN)

The proposed development will increase volumes of traffic associated with:

- The transportation of waste streams that will be delivered to and processed at the site and ultimately hauled from the site for further processing.

In relation to selecting sensitive receptors to consider potential human health impacts, DMRB states:

> *Sensitive receptors shall be chosen within 200m of the ARN and include residential properties, schools and hospitals for the assessment of annual mean air quality thresholds. Where there is a risk of the short-term air quality thresholds being exceeded.*

In relation to selecting sensitive receptors to consider potential ecological impacts, DMRB states:

> *Internationally, nationally and locally designated sites of ecological conservation importance on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity (known as designated habitats) within 200m of the ARN shall be included in the air quality assessment.*

If the scoping assessment indicates that an assessment is required, DMRB provides a risk-based mechanism to determine whether a simple or detailed air quality assessment is required. The level of assessment is determined by the level of risk and the stage of assessment for a project.

A simple assessment provides sufficient information to confirm that the project does not result in any exceedances of the air quality thresholds. A detailed level of assessment is more likely where there is a risk of exceeding air quality thresholds and for the detailed design stage of the project lifecycle. To determine whether a simple or detailed air quality assessment is required, the project risk potential (Table 9 12) and the receiving environment sensitivity (Table 9 13) must be determined.

Table 9 12 Project Risk Potential

Risk	Project examples
High	1) large smart motorway projects, bypass and major motorway junction improvements.
Low	1) junction congestion relief project i.e. small junction improvements, signalling changes. 2) short smart motorway projects.

Table 9-123 Receiving Environment Sensitivity

Sensitivity	Features of receiving environment
High	1) large number of receptors (human and / or ecological) within 50m of roads triggering traffic screening criteria; 2) base line monitoring data indicates concentrations above the AQS Objective / EU limit value; 3) monitoring indicates exceedances of short term AQS Objectives / EU limit value; 4) projecting forward monitored concentrations to the opening year, indicates exceedances of AQS Objectives / EU limit value; 5) AQMAs or reported EU limit value exceedances within project's study area.
Medium	1) receptors (human or ecological) within 50m of roads triggering traffic change criteria; 2) base line monitoring data illustrates annual mean NO_2 concentrations >36µg/m³; 3) projections indicate annual mean NO_2 concentrations>36µg/m³ in opening year; 4) AQMAs or EU limit value exceedances within project's study area.
Low	1) few receptors located close to roads triggering traffic change criteria; 2) base line monitoring data illustrates concentrations in base year below an annual mean of 36µg/m³; 3) no AQMAs or EU limit value exceedances within project's study area.

The project risk potential and the receiving environment sensitivity are combined to determine whether a simple or detailed air quality assessment is required based on the framework presented in Table 9-13. Highways England (2019) states:

> *Low risk projects are likely to result in traffic changes that are localised to the project and high risk projects are likely to impact traffic flows over a much wider area.*

The elements of simple and detailed air quality assessments are presented in Table 9-14.

Table 9-134 Framework to Determine if a Simple or Detailed Assessment is Required

Risk potential of project	Receiving environment sensitivity		
	High	Medium	Low
High	Detailed	Detailed	Simple
Low	Detailed	Simple	Simple

Table 9-145 Simple and Detailed Assessment Elements

	Simple assessment	Detail assessment
Traffic input	1) AADT / AAWT	1) period flows: 2) morning (AM); 3) inter peak period (IP); 4) evening peak period (PM); and 5) overnight period (OP).
Air quality modelling	1) qualitative statement; or 2) where required the Overseeing Organisation's air quality spreadsheet model.	1) detail air quality dispersion model
Receptors	1) a proportionate number of representative receptors which are located in areas with the highest concentrations and largest improvements and worsening as a result of the project.	1) representative; 2) all receptors with the likelihood to exceed air quality threshold.

A simple assessment can be undertaken using the overseeing organisation's air quality spreadsheet. The latest version of the air quality spreadsheet issued by the Highways Agency in England is Version 8 (Highways Agency, 2021), which incorporates emissions derived from the Emissions Factor Toolkit Version 10.1 (DEFRA, 2020).

Highways Agency indicates that the main potential impacts on air quality from increased traffic that results from development is from PM_{10}, NO_2 and NO_x. Levels of sulphur dioxide, carbon monoxide and benzene are highly unlikely to be exceeded in Ireland and within the study area due to increased traffic from the proposed development at the operational stage and have therefore not been considered further.

The impact of $PM_{2.5}$ has not been considered in the traffic assessment as Highways Agency (2019) states:

> *There should be no need to model $PM_{2.5}$ as the UK currently meets its legal requirements for the achievement of the $PM_{2.5}$ air quality thresholds and the modelling of PM_{10} can be used to demonstrate that the project does not impact on the $PM_{2.5}$ air quality threshold.*

Ireland also meets its legal requirements for the achievement of the $PM_{2.5}$ air quality thresholds and therefore $PM_{2.5}$ has not been considered further.

9.3.4 *Method for the Conversion of NO_x to NO_2*

Combustion processes release a group of compounds collectively known as oxides of nitrogen (NO_x). Oxides of nitrogen include both nitric oxide (NO), nitrogen dioxide (NO_2) and nitrous oxide (N_2O). NO_2 and NO undergo a series of complex reactions in air, that involve NO, ozone (O_3) and nitrogen dioxide NO_2 in the presence of sunlight. The reactions are summarised in Equation 1, 2, and 3 below:

- Equation 1: $NO + O_3 \rightarrow NO_2 + O_2$
- Equation 2: NO_2 + sunlight $\rightarrow NO + O$
- Equation 3: $O + O_2 \rightarrow O_3$

This assessment has characterised the conversion of NO to NO_2 in accordance with the NO_x to NO_2 Conversion Spreadsheet (Version 7.1, June 2019) (Ricardo Energy and Environment, 2019). This spreadsheet requires regional concentrations of ozone, oxides of nitrogen and nitrogen dioxide above the surface layer and the fraction of nitrogen oxides emitted as nitrogen dioxide to be specified. NRA (2011) specifies that the region of the UK that should be selected to best characterise regional concentrations of ozone, oxides of nitrogen and nitrogen dioxide in Ireland is Craigavon in Northern Ireland.

The NO_x to NO_2 Conversion Spreadsheet (Version 7.1) specifies concentrations of ozone, oxides of nitrogen and nitrogen dioxide for Armagh City, Banbridge and Craigavon, which was selected to represent the site of the proposed development in the NO_x to NO_2 Conversion Spreadsheet for this assessment. The fraction of nitrogen oxides emitted as nitrogen dioxide was determined based on the "All other urban UK traffic" option in the spreadsheet.

9.3.5 *Evaluation Criteria*

9.3.5.1 Air Quality

The significance of air quality impacts in the operational stage were determined based on compliance with the limit values of the *Air Quality Standards Regulations 2011, (S.I. No. 180 / 2011)* as amended (Air Quality Standards), which are presented in Table 9-156. The annual average limit values for SO_2 and NO_x are for the protection of vegetation and ecosystems, respectively. All other limit values specified in the Table are for the protection of human health.

Table 9-156 Air Quality Standards Regulations 2011 (SI No. 180/2011)

Air contaminant	Averaging period	Limit value (µg/m³)	Basis of application of limit value
CO	8-hour	10000	Maximum
NO_2	1-hour	200	Not to be exceeded more than 18 times in a calendar year
	annual	40	Average
PM_{10}	24-hour	50	35th Highest
	annual	40	Average
$PM_{2.5}$	annual	25	Average
SO_2	1-hour	350	Not to be exceeded more than 24 times in a calendar year
	24-hour	125	Not to be exceeded more than 3 times in a calendar year
	annual	20	Average
NO_x	annual	30	Average

The criteria described in NRA (2011) were used to determine the significance of air quality impacts from traffic in the operational stage. The NRA methodology to determine the significance of air quality impacts involves categorising the magnitude of change in concentrations of air contaminants according to the criteria identified in Table 9.17.

The NRA methodology includes definitions of impact magnitude for changes in the number of days with PM_{10} concentration greater than 50 µg/m³ and for changes in annual mean $PM_{2.5}$. Table 9-18 excludes these as the Highway Agency's latest spreadsheet calculates annual average concentrations of NO_x and PM_{10} and not shorter-term average concentrations.

Table 9-167 Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations

Magnitude of Change	Annual Mean NO_2/PM_{10}
Large	Increase/decrease ≥4 µg/m³
Medium	Increase/decrease 2 - <4 µg/m³
Small	Increase/decrease 0.4 - <2 µg/m³
Imperceptible	Increase/decrease <0.4 µg/m³

Table 9-178 Air quality Impact Descriptors for Changes to Annual Mean Nitrogen Dioxide and PM_{10} Concentrations at a Receptor

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration a		
	Small	Medium	Large
Above Objective/Limit Value With Scheme (≥40 µg/m³ of NO_2 or PM_{10})	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value With Scheme (36-<40 µg/m³ of NO_2 or PM_{10})	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value With Scheme (30-<36 µg/m³ of NO_2 or PM_{10})	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value With Scheme (<30 µg/m³ of NO_2 or PM_{10})	Negligible	Negligible	Slight Adverse

The relationship between the annual average and 1-hour average concentration is discussed in NRA (2011) which states:

> *The standards for nitrogen dioxide are expressed in terms of both the annual mean and the number of hours above 200 µg/m³. It is not straightforward to predict exceedances of the 1-hour standard and all models are inevitably poorer at predicting short-term peaks than they are at predicting annual mean concentrations. However, empirical data suggest that the hourly mean standard is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m³.*

The relationship between the annual average and the number of exceedances of the 24-hour average concentration standard for PM_{10} is also discussed in NRA (2011) which states:

> *The standards for PM_{10} are expressed as the annual mean and the number of days above 50 µg/m³. Dispersion models are inherently less accurate at predicting exceedances of the 24-hour mean PM_{10} standard than for the annual mean standard. An empirical relationship between the annual mean concentration and the number of days >50 µg/m³ PM_{10} has been derived in LAQM.TG(09) and takes the form:*
>
> *No. 24-hour mean exceedances = -18.5 + 0.00145 x annual mean³ + (206/annual mean)*

This relationship has been adopted to determine if the impact of traffic emissions on air quality is likely to result in exceedances of the 24-hour average concentration standard for PM_{10}.

9.3.5.2 Nuisance Dust

Dust particles in the ambient environment can cause nuisance. Localised increases in dust particles are often associated with exposure of soil surfaces, or activities that involve the disturbance of soil or rock-based materials, such as agricultural and construction activities.

Whether dust deposition becomes an issue for the general public depends on a variety of factors including the sensitivity of nearby locations, the repetition of any dust deposition occurring and the characteristics of the deposited materials. The focus for dust control and emissions is on minimising the potential for a nuisance occurring in the first instance and implementing good site practices where practicable.

There are currently no Irish or European Union air quality standards for deposited dust. In 2004, the DEHLG issued Quarries and Ancillary Activities Guidelines for Planning Authorities, which states "There are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral/aggregate dust"

A subsequent report issued by the EPA and titled: Environmental Management Guidelines - Environmental Management in the Extractive Industry (EPA, 2006) states:

> *The impact of dust is usually monitored by measuring rates of dust deposition (DoE, 1995). There are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral dust. There are a number of methods to measure dust deposition but only the German TA Luft Air Quality Standards (TA Luft, 1986) specify a method of measuring dust deposition – The Bergerhoff Method (German Standard VDI 2119, 1972) – with dust nuisance. It is the only enforceable method available.*

The TA Luft air quality standard has become the most commonly used method for the assessment of dust deposition. This involves determining a mass dust deposition rate per unit area over a given time period, using a direct collection pot with standard dimensions of either glass or plastic. The system benefits from being a direct collection method i.e. less transferring of material and consequent reduction in sampling errors. This method is defined as an internationally recognised standard and has been adopted by the EPA as the method of choice for measuring deposited dust associated with licensed facilities.

The TA Luft has recommended a threshold guideline value of 350 mg/m²/day for dust deposition. Below this threshold guideline value dust deposition problems are considered less likely. The EPA and local authorities generally apply the TA Luft guideline to development consents and Industrial Emissions Licences

9.3.5.3 Odour

In 2020, the EPA issued its updated guidance document air quality impact assessment (known as AG4). Appendix H of this document provides guidance that is specific to the assessment of odour impacts using dispersion modelling techniques. In relation to the odour assessment criteria, AG4 states:

> *Currently there is no general statutory odour standard in Ireland relating to industrial installations.*
> *.....*
> *Guidance from the UK (EA, 2011, and adapted for Irish EPA use) recommends that odour standards should vary from 1.5 – 6.0 OUE/m3 as a 98th%ile of one hour averaging periods at the worst-case sensitive receptor based on the offensiveness of the odour and with adjustments for local factors such as population density...*

Table A4 of AG4 contains indicative odour standards based on offensiveness of odour that have been adopted for use in Ireland. Relevant aspects are:

- The most offensive odours should be assessed against an Indicative Criterion of 1.5 OU_E/m^3 as a 98th%ile of hourly averages at the worst-case sensitive receptor
- Moderately offensive odours should be assessed against an Indicative Criterion of 3.0 OU_E/m^3 as a 98th%ile of hourly averages at the worst-case sensitive receptor
- Less offensive odours should be assessed against an Indicative Criterion of 6.0 OU_E/m^3 as a 98th%ile of hourly averages at the worst-case sensitive receptor.

The industrial sectors that fit into each category are described as follows:

- Most offensive:
    - Processes involving decaying animal or fish remains.
    - Processes involving septic effluent or sludge waste sites including landfills, waste transfer stations and non-green waste composting facilities.
- Moderately offensive
    - Intensive Livestock Rearing
    - Fat Frying / Meat Cooking (Food Processing)
    - Animal Feed
    - Sugar Beet Processing
    - Well aerated green waste composting.
- Less offensive
    - Brewery / Grain / Oats Production
    - Coffee Roasting
    - Bakery
    - Confectionery.

The sources of odour at the proposed development fall into the most offensive category based on EPA guidance and the odour exposure criterion relevant to operations at the site is C_{98}, 1-hour ≤ 1.5 ou_E/m^3.

9.4 Receiving Environment

9.4.1 *Regional & Local Meteorological Conditions*

The dominant influence on Ireland's climate is the Atlantic Ocean. Consequently, Ireland does not suffer from the extremes of temperature experienced by many other countries at similar latitude. The warm North Atlantic Drift has a marked influence on sea temperatures. This maritime influence is strongest near the Atlantic coasts and decreases with distance inland. The hills and mountains, many of which are near the coasts, provide shelter from strong winds and from the direct oceanic influence. Winters tend to be cool and windy, while summers, when the depression track is further north and depressions less deep, are mostly mild and less windy (Met Eireann https://www.met.ie/climate/climate-of-ireland).

The site is located in Dublin 11 km from the east coast of Ireland. Meteorological conditions at the site are therefore not significantly affected by coastal influences, which generally occur within 10 km of the coast (EPA, 2020). Land features (terrain and land use) in the vicinity of the site can be described as residential and industrial land, which is flat. At its closest point, the site is approximately 6.0 km from the foothills of the Dublin Mountains.

The proximity of a site to rivers can affect local meteorological parameters such as wind speed and wind direction. The wind direction observed at a site can be heavily affected by the orientation of the river with winds aligning with the orientation of the river. Rivers are generally at the lowest point in the local terrain, often in valleys that induce drainage air flows. The site is in the flatlands between the River Dodder and the River Liffey.

The nearest meteorological station operated by Met Eireann is at Casement Aerodrome, which is approximately 6 km southwest of the site. Casement Aerodrome is located approximately 18 km from the eastern coastline of Ireland. It is in a relatively flat part of Ireland with terrain that gently slopes from the higher ground to the east down to the flatlands of west Kildare. The general climate (in terms of

temperature, relative humidity and rainfall) and local meteorological conditions that affect dispersion (predominantly wind speed and direction) at Casement Aerodrome would provide a highly indicative representation of climate at the site.

The data from the observation station at Dublin is considered highly representative of the Site due to:

- The close proximity of the observation station to the Site
- The similar nature of the terrain at both locations
- The similar nature of land use at both locations
- The absence of major terrain features in the vicinity of the observation station and the Site
- The absence of coastal affects at the observation station and the Site
- Both locations being located in a flat valley that runs from west to east.

The climate and local meteorological conditions of the site was therefore characterised using the parameters observed at Casement Aerodrome.

The observation station at Casement Aerodrome has recorded long term data that represents regional climate characteristics. Long term meteorological data reported between 1991 and 2020 at Casement Aerodrome is summarised in Table 9.19.

Table 9-189 Long-Term Average Meteorological Parameters Casement Aerodrome between 1981 and 2010

Parameter	30-year average
Mean Temperature (°C)	9.9
Mean Relative Humidity (9 AM UTC) (%)	84.2
Mean Daily Sunshine Duration (Hours)[1]	3.8
Annual Rainfall (mm)	783.5
Averaged total rainfall (mm) (Summer)	196.3
Averaged total rainfall (mm) (Winter)	184.1
Average Windspeed (m/s)	5.2
Monthly average windspeed (m/s) (Summer)	4.4
Monthly average windspeed (m/s) (Winter)	6.2

Wind speed and wind direction are important parameters for the transport and dispersion of air pollutants from a source. A wind rose representing the annual distribution of 1-hour average winds at Casement Aerodrome is presented in Figure 9-1. Diurnal and seasonal windroses for Casement Aerodrome are presented in Figure 9-2 and Figure 9-3. The prevailing wind at Casement Aerodrome is from the west and southwest. Winds are aligned to the valley in which the observation station is situated. Winds from the north and northeast are infrequent. The winter months are and windier than the summer months however summer months are wetter.

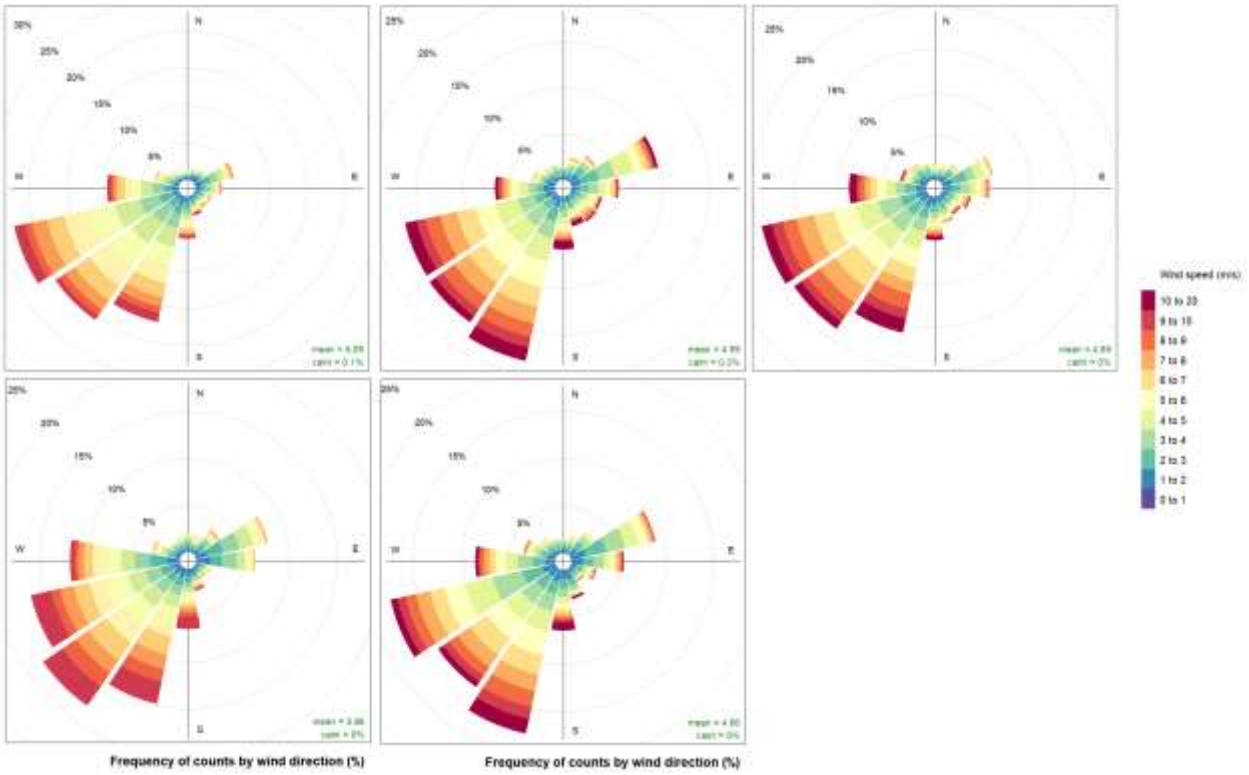

Figure 9-1 **Annual windrose for Casement Aerodrome (Source of data: Met Eireann)**

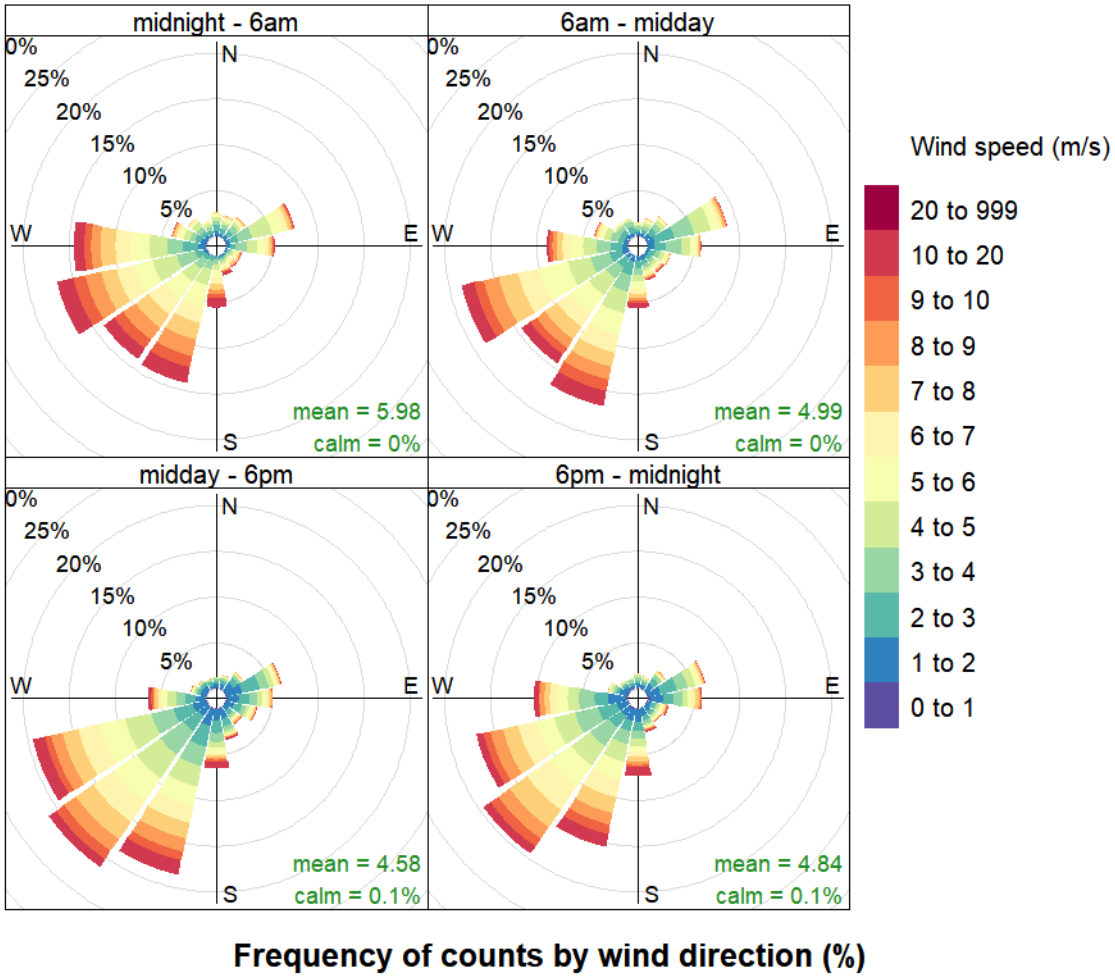

Figure 9-2 **Diurnal Windroses for Casement Aerodrome (Source of data: Met Eireann)**

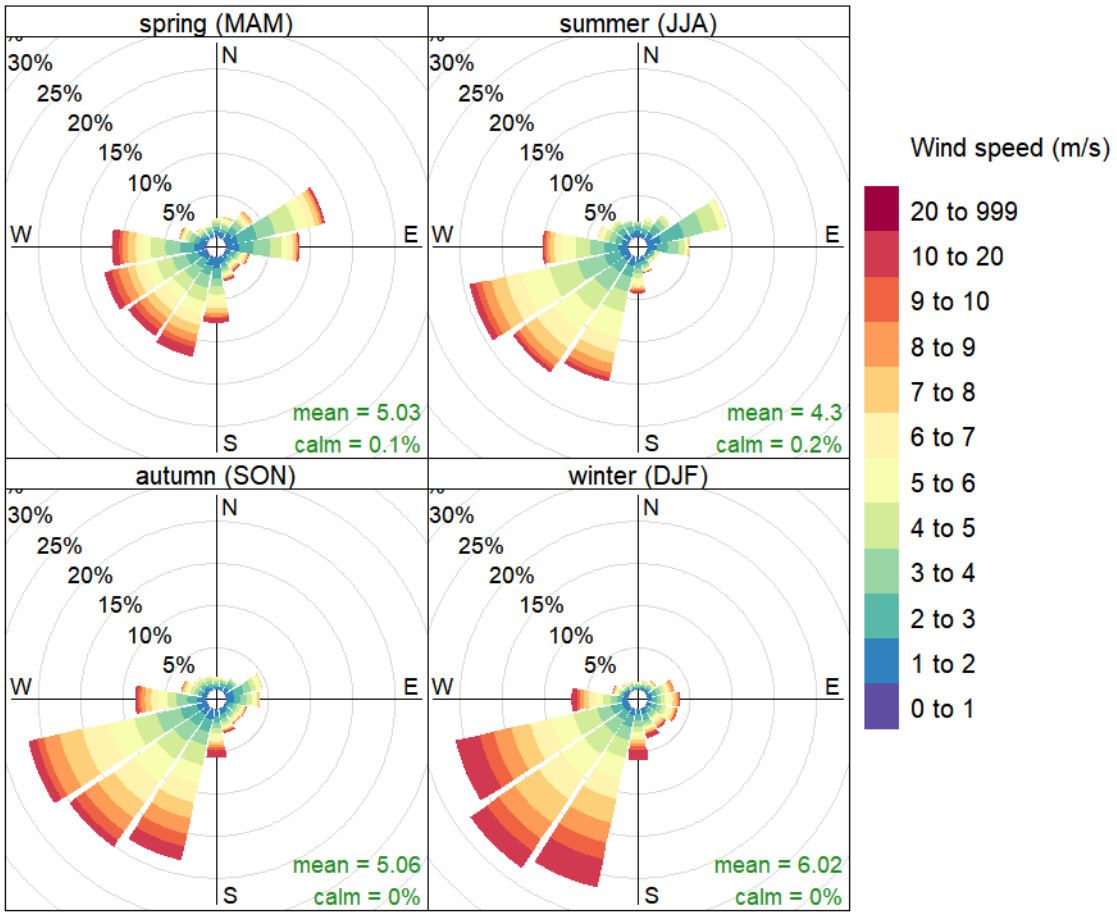

Figure 9-3 Seasonal Windroses for Casement Aerodrome (Source of data: Met Eireann)

9.4.2 *Baseline Air Quality*

9.4.2.1 Air Quality

Under the Clean Air for Europe Directive, EU member states must designate "Zones" for the purpose of managing air quality. In Ireland, four zones are defined in the *Air Quality Standards Regulations 2011* (DEHLG, 2011). The Proposed Facility is in Zone A, which is Dublin.

The site and its surroundings are presented in Figure 9-4 that shows it is surrounded by industrial and commercial installations and farmland. It is approximately 800m north of the residential areas of Finglas. There are a number of isolated dwellings in closer proximity to the site.

Baseline air quality in the study area is affected by:

- Typical baseline levels of air contaminants that are prevalent at Zone A locations that are representative of the site, and
- Emissions from industrial installations located in close proximity to the site.

A review was undertaken of the commercial and industrial installations in close proximity to the site. The review indicated that:

- The premises in the immediate vicinity of the site generally consist of commercial sales premises such as machinery sales yards, vehicle sales yards, home improvement sales rooms and associated stock warehouses and light commercial premises and warehousing.

- There is a large scale industrial ferrous metal processing facility operated by Galco Steel Ltd located 100 m north of the site. The main processing buildings at the Galco Steel Facility are 220 m north of the site.

- There are a number of licensed waste facilities located within 1 km of the site

Figure 9-4 The Site Boundary of the Proposed Development and Surrounding Areas

The Galco Steel Facility holds an Industrial Emissions Directive (IED) licence (P0284-02) registration issued by the Environmental Protection Agency (EPA). The IED Licence for the Galco Steel Facility specifies Emission Limit Values (ELVs) that are designed to ensure that emissions to the atmosphere from operations do not result in air pollution beyond the site boundary. A review of compliance records for the Galco Steel Facility publicly available on EPA's website indicates that:

- As the licence application for the Galco Steel Facility was submitted 21 years ago in 2002, the licence application documents including air quality modelling or monitoring reports are not available;

- There is no ambient air quality monitoring undertaken as part of regular licence compliance requirements for the Galco Steel Facility;

- The main fuel used at the Galco Steel Facility is natural gas;

- Process emissions from the galvanising baths controlled using a bag filter before being exhausted to the atmosphere through elevated stacks, and

- Stack testing reports indicate that emissions to atmosphere from onsite exhaust points comply with ELVs specified in the Galco Steel Facility EPA Licence.

Air quality in the study area is likely to be influenced by emissions exhausted to the atmosphere from the Galco Steel Facility with the level of air contaminants highest at the site boundary and falling rapidly with distance from the site boundary. The fuel used is natural gas and particulate matter abatement is adopted at the Galco Steel Facility. Consequently, the Galco Steel Facility will be:

- Likely to have significant effect on baseline levels of:
    - NO_2 in the study area due to the combustion of natural gas.
    - PM_{10} or $PM_{2.5}$ in the study area due to the abated process emissions

- Be unlikely to have significant effects on baseline levels of:
    - SO_2 which is likely to result from the low sulphur content of natural gas
    - CO above ambient levels due to the low levels of impact of CO in relation to the guidance level for impacts

As there are no publicly available air quality reports or reported ambient monitoring in close proximity to the Galco Steel Facility, it is considered appropriate to determine baseline air quality in the study area from monitoring that is undertaken in industrial areas of Zone A. Ambient air quality monitoring undertaken at Dublin Port was used to represent air quality levels in the vicinity of industrial installations in the study area.

The baseline levels that are typical of Zone A were determined from three reports:

- Air Quality in Ireland 2022 – Indicators of Air Quality (EPA, 2023)

- Air Quality in Ireland 2021 – Indicators of Air Quality (EPA, 2022)

- Air Quality in Ireland 2020 – Indicators of Air Quality (EPA, 2021)

Background air quality data for Zone A was also obtained from publicly available air quality monitoring data from the National Monitoring Network that is published on the EPA website.

Background air quality data observed at Zone A ambient air monitoring sites was used including data from:

- Ballyfermot, Tallaght, Walkinstown and Dublin Port to represent ambient levels of NO_2 at the site
- Ballyfermot, Tallaght, Walkinstown and Dublin Port to represent ambient levels of PM_{10} and $PM_{2.5}$ at the site
- Winetavern St, Rathmines, Tallaght, Dublin Port and Ringsend to represent ambient levels of SO_2 at the site

The closest NO2 monitoring stations to the site is at Ballyfermot, approximately 3 km north of the site. NO2 is also measure at the EPA monitoring station at Tallaght which is approximately 3.5 km south of the site. The monitoring stations at Ballyfermot and Tallaght are surrounded by residential areas and roads typical of a suburban town centre. The air quality at these location is influenced by emissions from road traffic and residential heating and is considered to be a conservative representation of background air quality at the site. Baseline levels of NO2 from Dublin Port, a heavily industrialised port location, was also considered in the development of a baseline as it is provides a representative indication of levels of NO2 in industrial areas of Zone A.

In relation to PM_{10} and $PM_{2.5}$, the monitoring location at Walkinstown is 2.3 km from the site and is surrounded by residential areas and roads typical of a suburban town centre. The monitoring stations at Ballyfermot and Tallaght are also in relative close proximity to the site. The air quality at these locations is influenced by emissions from road traffic and residential heating and is considered to be a conservative representation of background air quality at the site. The monitoring location at Dublin Port provides a representative indication of PM_{10} and $PM_{2.5}$ levels in an industrial location of Zone A. Considering the proximity of the Walkinstown, Ballyfermot and Tallaght monitoring locations to residential areas and local roads and the proximity of the Dublin Port monitoring location to industrial sources of emissions the use of worst case data collected at these locations is considered to provide a conservative characterisation of baseline PM_{10} and $PM_{2.5}$ in the study area.

In relation to SO_2 and CO, the highest observed concentrations of these air contaminants at Winetavern St, Rathmines, Tallaght or Ringsend over a three-year period provide a conservative indication of baseline levels of these air contaminants in the study area as local emissions will not result in ground level concentrations that exceed these observed worst-case levels.

The long-term data presented in Table 9.20 indicates that the level of air contaminants reported are well below the limit values specified in the Air Quality Standards Regulations 2022 (S.I. No. 739 / 2022). The data is representative of the baseline air quality at the site and indicates that the baseline air quality in the vicinity of the site is good.

In relation to PM_{10}, the Air Quality Standards Regulations 2012 states that the 50 µg/m³ daily limit value may not be breached more than 35 times in a calendar year. EPA does not report a daily limit that can be adopted as a baseline for modelled ground level concentrations of PM_{10}. UK DEFRA and EPA advise that the 36th high 24-hour mean process contribution can be added to the annual mean background PM_{10} to determine the cumulative daily impacts of PM_{10} from localised sources with background.

Table 9-20 Ambient Air Contaminants Representative of Baseline Air Quality in the Study Area

Pollutant	Averaging period	Baseline Ambient Value (µg/m³)	Source
Nitrogen dioxide	1-hour	121.5	Maximum1-hour average concentration measured at Swords, Casement Aerodrome or Dublin Port between 2019 and 2021 in combination with localised ground level concentrations resulting from emissions from localised industrial installations
	Annual	27.3	Maximum1-hour average concentration measured at Swords, Casement Aerodrome or Dublin Port between 2019 and 2021 in combination with localised ground level concentrations resulting from emissions from localised industrial installations
PM_{10}	24-hour	20	Maximum from Blanchardstown, Finglas, Dublin Port or Casement Aerodrome between 2019 and 2021
	Annual	20	Maximum from Blanchardstown, Finglas, Dublin Port or Casement Aerodrome between 2019 and 2021
$PM_{2.5}$	Annual	9	Maximum from Blanchardstown, Finglas, Dublin Port or Casement Aerodrome between 2019 and 2021
Sulphur Dioxide	1-hour	63	Maximum from Winetavern St, Rathmines, Tallaght or Ringsend between 2019 and 2021
	24-hour	44	Maximum from Winetavern St, Rathmines, Tallaght or Ringsend between 2019 and 2021
	Annual	5	Maximum from Winetavern St, Rathmines, Tallaght or Ringsend between 2019 and 2021
Carbon Monoxide	8-hour Rolling	3,600	Maximum from Winetavern St between 2019 and 2021

A review of nearby commercial and industrial activities was undertaken to characterise baseline odour levels in the study area. The review identified that:

- There are six EPA licensed waste management facilities within 1 km of the site boundary including:
    - Oxigen Environmental - EPA Licence registration W0152-03 -
      Irish Packaging Recycling - EPA Licence registration W0263-01
    - Key Waste Management Limited - EPA Licence registration W0045-01
    - South Dublin County Council - EPA Licence registration W0003-03
    - Starrus Eco Holdings Limited - EPA Licence registration W0238-01
    - Oxigen Environmental - EPA Licence registration W0208-01

- The nature of all other commercial and industrial operations in the study area including retail and warehousing activities are not associated with odorous emissions that would affect baseline levels of odour in the study area.

9.4.2.2 Odour

Katestone undertook a review of licence compliance documentation submitted to EPA for the six EPA licensed waste management facilities within 1 km of the site boundary of the proposed development. The review indicated that there were no complaints due to odour recorded against any of the six facilities in 2022. This indicates that baseline odour levels due to the cumulative impact of the six EPA licensed waste management facilities in the study area does not result in odour at levels that would cause odour nuisance.

9.4.3 *Sensitive Receptors*

The sensitive human receptors that are of greatest interest are residential and commercial locations in close proximity to construction and operational activities at the site. Construction activities including earthworks, construction and trackout will occur in close proximity to residential and commercial areas. The sensitive receptors included in the assessment of construction phase impacts are presented in Table 9-21 and Figure 9-5.

Table 9-21 Sensitive Receptors Included in the Assessment

Receptor ID	Receptor Type	x-coordinate	y-coordinate
		UTM (m)	
SR1	Commercial	676,260	5910,249
SR2	Commercial	676,205	5910,196
SR3	Commercial	676,175	5910,142
SR4	Commercial	676,099	5910,200
SR5	Commercial	676,127	5910,272
SR6	Commercial	676,078	5910,263
SR7	Commercial	676,113	5910,297
SR8	Commercial	676,190	5910,322

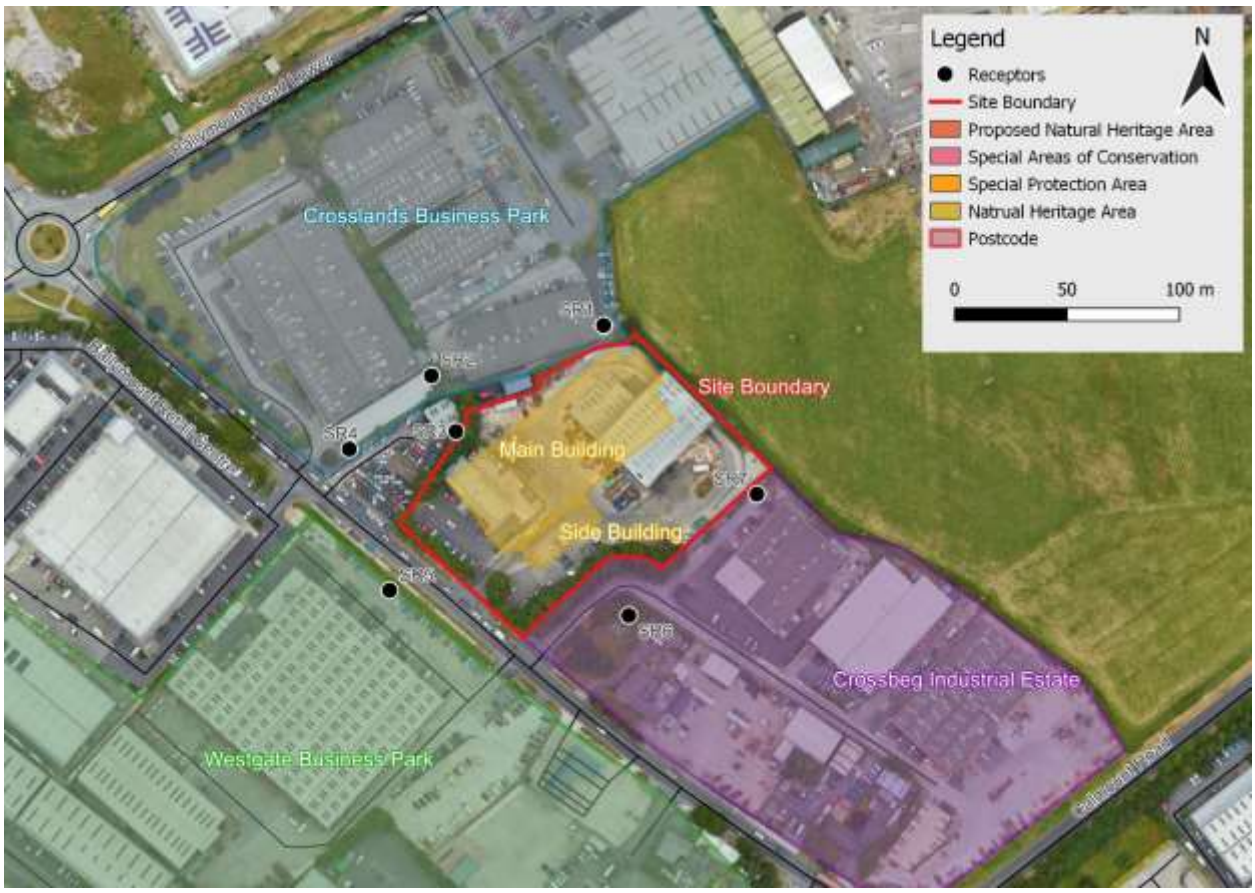

Figure 9-5 Sensitive Human Receptors Construction and Operational Stages

The sensitive receptors considered in the assessment of impacts of traffic in the operation stage are listed in Table 9.22 and shown on Figure 9.7

Table 9-22 Sensitive receptors considered in the assessment of impacts of traffic at the operational phase of the proposed development on air quality

Receptor ID	Receptor Type	x-coordinate	y-coordinate
		UTM (m)	
SR1	Commercial	675,972	5910,297
SR2	Commercial	676,074	5910,247
SR3	Commercial	676,101	5910,196
SR4	Residential	676,206	5910,151
SR5	Commercial	676,190	5910,130
SR6	Commercial	676,250	5910,094
SR7	Commercial	676,305	5910,081
SR8	Commercial	676,310	5909,998
SR9	Commercial	676,377	5909,971
SR10	Commercial	676,450	5910,122

Figure 9-6 Sensitive Receptors on the Affected Road Network (ARN

There are three Natura 2000 ecological sensitive sites within 10 km of the proposed development including the Glenasmole Valley SAC, the Wicklow Mountains SAC and the Wicklow Mountains SPA. The location of these SACs in relation to the proposed development are presented in Figure 9-7. The shortest distance between the proposed development and these Natura 2000 sites is:

- 700 m from the Glenasmole Valley SAC
- 9.0 km from the Wicklow Mountains SPA
- 9.3 km from the Wicklow Mountains SPA.

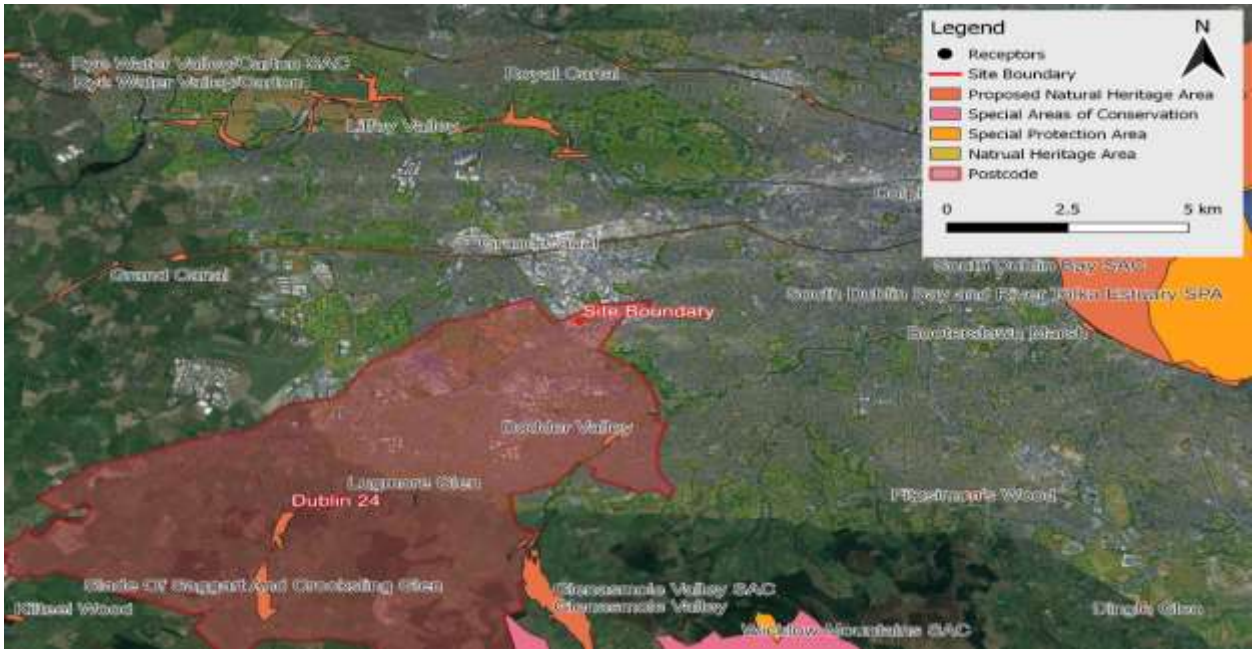

Figure 9-7 Location of Natura 2000 Sites Within 10 km of the Proposed Development

9.5 Impacts

9.5.1 *Construction Stage*

Potential temporary impacts on air quality associated with the construction stage are dusts and vehicle exhaust emissions. Dusts are likely to arise from the following activities (IAQN, 2014):

- Demolition
- Earthworks
- Wind blow from temporary stockpiles
- Handling of construction materials
- Landscaping
- Construction traffic movements (Trackout)

The screening assessment, conducted in accordance with in IAQM (2014), indicated that a more detailed assessment is required as there are human receptors within 350 m of the boundary of the site and within 50 m of the routes used by construction traffic.

There are no ecological receptors within 50 m of the boundary of the site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance. The effect of the construction stage on ecological receptors can be screened out, meaning that the effects are negative and temporary.

The air quality assessment of the construction phase of the proposed development on senstive human locations was conducted for the following construction elements:

- Demolition
- Earthworks
- Construction
- Trackout.

Demolition is required to remove existing buildings. The volume of buildings to be demolished is considered medium according to IAQM guidance

Earthworks are required to facilitate the levelling of the site, the installation of a drainage network and installation of foundations and piles. As a precautionary measure it was assumed that the maximum land area on which earthworks will take place is greater than 10,000 m². According to IAQM (2014) size categories, earthwork activities are therefore classified as large.

Construction will involve developing the material intake and handling building, offices, OCU and car park. The volume of buildings that will be constructed is between 25,000 m³ and 100,000 m³. According to IAQM (2014) size categories, construction activities are therefore classified as medium.

Earthworks and construction will involve the removal of topsoil and excavated inert material and delivery of construction materials using heavy duty vehicles (HDVs). The maximum number of HDVs on any one day will be between 10 and 50. According to IAQM (2014) size categories, trackout is therefore classified as medium.

A summary of the size of each construction activity for the purpose of adopting IAQM (2014) guidance is presented in Table 9-23.

Table 9-23 Summary of the Scale of Each Construction Activity

Activity	Size	Magnitude Of Activity	Unit of Activity
Demolition	Medium	20,000 to 50,000	m^3 of structures demolished
Earthworks	Large	>10,000	m^2 of earthworks area
Construction	Medium	25,000 to 100,000	m^3 of construction buildings
Trackout	Medium	10 to 50	maximum number of vehicles per day

Demolition, earthworks, construction and trackout will take place in relatively close proximity to a single residential location and commercial places of work in the immediately vicinity of the site boundary. The closest residential receptor is 40 m from the site boundary. According to IAQM (2014) residential locations are classified as "highly sensitive receptor" in terms of potential dust soiling effects and to health effects on people.

There are a number of commercial operations within 20 m of site boundary that comprise of a car sales yard and a number of commercial units. Places of work are classified as "medium sensitive receptor" in terms of potential dust soiling effects and to health effects on people.

A single residential receptor location was considered within 50 m of the site boundary. It was conservatively estimated that there are more than 10 receptors, representing the workers at business units in the buildings in closest to the site boundary. Considering the baseline level of PM_{10} and the number of receptors affected, the sensitivity of the area to adverse impacts of PM_{10} at the construction phase of the proposed development is medium. In terms of dust soiling, the area would be of medium sensitivity due to the commercial operations and the number of potentially affected receptors within 20 m of the site boundary.

Earthworks and construction activities will be conducted across the extents of the proposed development site. Earthworks and construction activities may occur within 20 m of the closest commercial premises and within 50 m of the closest residence. According to IAQM (2014) the sensitivity of the area to:

- Dust soiling impact is high because between 10 and 100 medium sensitive receptors are located at distances less than 20 m from earthworks and construction activities
- Human health impacts: sensitivity is medium as baseline PM_{10} levels are below 24 $\mu g/m^3$ and fewer than 100 medium sensitive receptors are located at distances less than 20 m from earthworks and construction activities.

Considering the magnitude of dust emissions and sensitivity of the area to dust impacts from earthwork activities, the unmitigated risk of dust impacts is classified as:

- A medium risk for dust soiling impacts, and
- A medium risk for health effects of PM_{10}

Considering the magnitude of dust emissions from trackout and sensitivity of the area to dust impacts, the unmitigated risk of dust impacts is classified as a low risk for both dust soiling and for health effects of PM_{10}.

Trackout activities will take place in along the Ballymount Road Upper and as the magnitude of the activity is medium, trackout activities are considered within 200 m of the site boundary. According to IAQM (2014) the sensitivity of the area in the vicinity of roads within 200 m of the site boundary to dust soiling and human health impacts are as follows:

- Dust soiling: sensitivity is medium because between 10 and 100 medium sensitive receptors (commercial and industrial premises) are located at distances less than 20 m from the site

entrance and less than 20 m trackout activities, and a single highly sensitive receptor is located within 50 m of the site entrance and less than 20 m trackout activities

- Human health impacts: sensitivity is low because baseline PM_{10} levels are below 24 µg/m³ and fewer than 10 medium sensitive receptors are located at distances less than 20 m from trackout activities and a single highly sensitive receptor is located less than 20 m trackout activities

Considering the magnitude of dust emissions from trackout and sensitivity of the area to dust impacts, the unmitigated risk of dust impacts is classified as a medium risk for dust soiling and low risk for health effects of PM_{10}.

A summary of the unmitigated risk of dust impacts from various construction activities is presented in Table 9-24.

Table 9-24 Summary of Unmitigated Risk of Dust Impacts s

Construction Activity	Dust Soiling	Health Effect PM_{10}
Demolition	Medium Risk	Medium
Earthworks	High Risk	Medium Risk
Construction	High Risk	Medium Risk
Trackout	Medium Risk	Medium Risk

The unmitigated impact of construction on air quality can be described in terms of dust soiling as negative, moderate and temporary effects. The unmitigated impact of construction on air quality can be described in terms of health impacts as negative, moderate and temporary effects. Mitigation is required to reduce potential impacts of construction activities to levels that can be described as not significant.

9.5.2 *Operational Stage*

9.5.2.1 Traffic

The potential for air quality impacts at the operational stage of the proposed development under the do-something scenario result from traffic associated with the proposed development. The air contaminants of concern from traffic include NO_x, NO_2 and PM_{10}.

Traffic data was obtained from Systra to determine the potential for air quality impacts at the operational stage of the proposed development under the do-something scenario. Traffic data was provided for the following road links:

- Turnpike Road
- Ballymount Rd Lower north of Ballymount Road Upper
- Ballymount Rd Lower south of Ballymount Road Upper
- Ballymount Rd Upper between Ballymount Road Lower and Panda
- Ballymount Rd Upper between Panda and Calmount Rd
- Calmount Rd north of Ballymount Road Upper
- Ballymount Road Upper east of Calmount Road
- Calmount Rd south of Ballymount Road Upper
-

The assessment of impacts of the operational phase of the proposed development is based on the air quality impacts due to predicted AADT and HDV AADT on the road links.

There will be no changes in speed band or no change in carriageway alignment by >=5m due to the proposed development.

The scoping assessment indicated that there is a single road link that triggers the traffic scoping criteria as the changes in HGV AADT between the do something traffic compared to the do minimum traffic in the opening year is greater than 200. The road links that triggers the scoping criteria is part of Ballymount Road Upper between the Site entrance and the Calmount Road. The ARN is therefore defined as this road link and 200 m along all adjoining road links including:

- Ballymount Road Upper between the Site and the Calmount Road
- 200 m along the Calmount Road north of Ballymount Road Upper
- 200 m along the Calmount Road south of Ballymount Road Upper
- 200 m along the Ballymount Road Upper east of Calmount Road
- 200 m along the Ballymount Road Upper west of the site entrance

The extent of the ARN is presented in Figure 9-67.

The project risk potential for each of these road links is low. The receiving environment sensitivity was determined to be medium for the following reasons:

- There are no residential receptors located close to road links that trigger traffic change criteria
- The baseline monitoring data illustrates concentrations in base year below an annual mean of 36µg/m³
- No AQMAs or EU limit value exceedances within project's study area

Combining the project risk potential and the receiving environment sensitivity in the framework described in Table 9-13 indicates that a simple air quality assessment is required to consider the impacts on the ARN.

The results of the assessment are presented for the modelled receptors on each of the road links on the ARN here. The magnitude of differences in predicted concentrations of NO_x, PM_{10} and NO_2 between the do-nothing scenarios in the opening and design year and the do-something scenario in the opening and design year form the basis to determine the significance of potential air quality impacts caused by traffic from the the proposed development at the operational stage. The predicted concentrations of NO_x, PM_{10} and NO_2 due to traffic related to the proposed development in isolation and in combination with background are presented in:

- Table 9-195 for the do-nothing scenario in the opening year
- Table 9-206 for the do-something scenario in the opening year
- Table 9-217 for the do-nothing scenario in the design year
- Table 9-228 for the do-something scenario in the design year

Table 9-195 Predicted Concentrations of NO_x, PM_{10} and NO_2

Receptor ID	Road Contribution			Background		Road + Background	
	NO_x	PM_{10}	NO_2	NO_2	PM_{10}	NO_2	PM_{10}
	µg/m³						
R1	4.9	1.1	2.4	27.3	20	29.7	21.1
R2	8.6	1.9	4.3	27.3	20	31.6	21.9
R3	6.9	1.5	3.4	27.3	20	30.7	21.5
R4	6.1	1.4	3.0	27.3	20	30.3	21.4
R5	6.1	1.4	3.0	27.3	20	30.3	21.4
R6	6.1	1.4	3.0	27.3	20	30.3	21.4
R7	6.9	1.5	3.4	27.3	20	30.7	21.5
R8	0.5	0.1	0.2	27.3	20	27.5	20.1
R9	5.9	1.3	2.9	27.3	20	30.2	21.3
R10	11.5	2.6	5.7	27.3	20	33.0	22.6

Table 9-206 Predicted concentrations of NO_x, PM_{10} and NO_2

Receptor ID	Road Contribution			Background		Road + Background	
	NO_x	PM_{10}	NO_2	NO_2	PM_{10}	NO_2	PM_{10}
	µg/m³						
R1	5.0	1.1	2.5	27.3	20	29.8	21.1
R2	8.7	2.0	4.3	27.3	20	31.6	22.0
R3	7.0	1.6	3.5	27.3	20	30.8	21.6
R4	6.2	1.4	3.1	27.3	20	30.4	21.4
R5	6.2	1.4	3.1	27.3	20	30.4	21.4
R6	6.2	1.4	3.1	27.3	20	30.4	21.4
R7	7.0	1.6	3.5	27.3	20	30.8	21.6
R8	0.5	0.1	0.2	27.3	20	27.5	20.1
R9	5.8	1.3	2.9	27.3	20	30.2	21.3
R10	11.6	2.6	5.7	27.3	20	33.0	22.6

Table 9-217 Predicted concentrations of NO_x, PM_{10} and NO_2

Receptor ID	Road Contribution			Background		Road + Background	
	NO_x	PM_{10}	NO_2	NO_2	PM_{10}	NO_2	PM_{10}
	µg/m³						
R1	3.2	1.2	1.6	27.3	20	28.9	21.2
R2	5.7	2.1	2.7	27.3	20	30.0	22.1
R3	4.6	1.7	2.2	27.3	20	29.5	21.7
R4	4.0	1.5	2.0	27.3	20	29.3	21.5
R5	4.0	1.5	2.0	27.3	20	29.3	21.5
R6	4.0	1.5	2.0	27.3	20	29.3	21.5
R7	4.5	1.7	2.2	27.3	20	29.5	21.7
R8	3.9	1.5	1.9	27.3	20	29.2	21.5
R9	3.9	1.5	1.9	27.3	20	29.2	21.5
R10	7.6	2.9	3.7	27.3	20	31.0	22.9

Table 9-228 Predicted Concentrations of NO_x, PM_{10} and NO_2

Receptor ID	Road Contribution			Background		Road + Background	
	NO_x	PM_{10}	NO_2	NO_2	PM_{10}	NO_2	PM_{10}
	µg/m³						
R1	3.3	1.2	1.6	27.3	20	28.9	21.2
R2	5.8	2.2	2.8	27.3	20	30.1	22.2
R3	4.6	1.7	2.2	27.3	20	29.5	21.7
R4	4.1	1.5	2.0	27.3	20	29.3	21.5
R5	4.1	1.5	2.0	27.3	20	29.3	21.5
R6	4.1	1.5	2.0	27.3	20	29.3	21.5
R7	4.6	1.7	2.2	27.3	20	29.5	21.7

R8	3.9	1.5	1.9	27.3	20	29.2	21.5
R9	3.8	1.4	1.9	27.3	20	29.2	21.4
R10	7.7	2.9	3.7	27.3	20	31.0	22.9

The number of days that the predicted 24-hour average concentration of PM_{10} was predicted to exceed the standard for PM_{10} was also calculated using the equation from Section 9.3.5.1. For do-something scenario in the design year, a maximum of three (8) exceedances of the PM_{10} standard of 50 µg/m³ were predicted. The standard allows up to 35 exceedances of 50 µg/m³ in an annual period. The modelling therefore shows that at the compliance with the 24-hour average standard for PM_{10} will be achieved at the worst affected receptor.

The difference in predicted concentrations of NO_x, PM_{10} and NO_2 due to traffic associated with the proposed development in isolation and in combination with background are presented in:

- Table 9-239 for the do-something scenario and the do-nothing scenario in the opening year
- Table 9-30 for the do-something scenario and the do-nothing scenario in the design year

Table 9-239 Difference in Predicted concentrations of NO_x, PM_{10} and NO_2

Receptor ID	NO_x	PM_{10}	NO_2	PM_{10}	NO_2
	µg/m³			Magnitude of Change	
R1	0.07	0.02	0.03	Not Significant	Not Significant
R2	0.13	0.03	0.07	Not Significant	Not Significant
R3	0.10	0.02	0.05	Not Significant	Not Significant
R4	0.13	0.03	0.06	Not Significant	Not Significant
R5	0.13	0.03	0.06	Not Significant	Not Significant
R6	0.13	0.03	0.06	Not Significant	Not Significant
R7	0.14	0.03	0.07	Not Significant	Not Significant
R8	0.00	0.00	0.00	Not Significant	Not Significant
R9	-0.07	-0.01	-0.03	Not Significant	Not Significant
R10	0.05	0.01	0.03	Not Significant	Not Significant

Table 9-30 Difference in Predicted concentrations of NO_x, PM_{10} and NO_2

Receptor ID	NO_x	PM_{10}	NO_2	PM_{10}	NO_2
	µg/m³			Magnitude of Change	
R1	0.04	0.02	0.02	Not Significant	Not Significant
R2	0.07	0.03	0.04	Not Significant	Not Significant
R3	0.06	0.02	0.03	Not Significant	Not Significant
R4	0.07	0.03	0.03	Not Significant	Not Significant
R5	0.07	0.03	0.03	Not Significant	Not Significant
R6	0.07	0.03	0.03	Not Significant	Not Significant
R7	0.08	0.03	0.04	Not Significant	Not Significant
R8	0.02	0.01	0.01	Not Significant	Not Significant
R9	-0.04	-0.01	-0.02	Not Significant	Not Significant
R10	0.03	0.01	0.01	Not Significant	Not Significant

Considering the worst case magnitude of change is “not significant” and the baseline annual average concentrations of PM_{10} and NO_2 in the study area are less than 30 µg/m³, the potential impact of the operational phase of the proposed develop on air quality is found to be negligible, negative and long-term.

In relation to ecological sites, there are no nationally and locally designated sites of ecological conservation importance on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity (known as designated habitats) within 200m of the ARN. The impact of the proposed development on ecological sites is therefore imperceptible, negative and long-term.

9.5.2.2 Odour

The potential for air quality impacts in the operational stage under the’ do-something’ scenario result from in-coming MSW and brown bin waste streams that will be handled and processed in the MRF.

The operational phase of the proposed development has the potential to result in odorous emissions that could cause adverse impacts that could in the absence of mtigation be described as significant, negative and long-term. Mitigation, in the form of an onsite odour abatement unit will be required to reduce potential impacts of operational activities to levels that can be described as not significant.

9.5.2.3 Fire

In the event of a fire, which is the worst case scenario, smoke emissions would be generated by the combustion of materials and wastes; however the localised impacts on air quality will be brief.

9.6 Likely Future Receiving Environment

In the absence of the proposed development, air quality at the site will remain at baseline levels. Baseline air quality levels at the site will change with time in line with general trends in air quality for the site and the wider surrounding area.

9.7 Prevention & Mitigation

9.7.1 *Design Stage*

9.7.1.1 Odour

An odour management system comprising the extraction of odorous air and its treatment in an odour control unit consisting of a dust filter to remove dusts and a carbon filter to reduce odour levels, will be installed in the section of the MRF where the MSW and ‘brown bin’ wastes are handled.

Prior to the installation of the system a thick foam spray will be applied to all cladding joints and other parts of the building fabric that could be susceptible to air leaks. The objective is to achieve an air leakage rate of < $2m^3/m^2$/hour. Rapid action doors will be fitted to the vehicle access points.

Air will be drawn from the building using an extraction fan and a system of internal ceiling mounted ducts provided with grills. The fan will have the capacity to achieve 2 air changes per hour. The air will pass through the dust filter before entering the carbon filter. A damper will be fitted to the inlet of the unit to allow the air flow to be balanced. The treated air will vent to atmosphere via a single stack. The stack height was determined by the air dispersion modelling to ensure that the ground level concentrations of the odours emitted in the operational stage would not be a cause of odour nuisance.

9.7.1.2 Fire Safety

The fire safety measures included in the design to mitigate the risk of fire outbreak are described in Section 10.8.1.6.

9.7.2 *Construction Stage*

When rainfall is greater than 0.20 mm/day, dust generation is generally suppressed. The potential for significant dust generation is also dependent on threshold wind speeds greater. Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest.

The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur.

A CEMP describing the proposed construction mitigation measures has been prepared and a copy is in Appendix 3.3. This document will be updated in advance of the construction stage to take into consideration any additional measures that may be required by conditions attached to planning permission. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- Water spraying of exposed earthworks and site haul road during dry weather using mobile bowser units.
- Provision of a wheel cleaning unit at the site access road to remove dirt from vehicles prior to exiting the site
- Control of vehicle speeds on site roads
- Material drop heights from plant to plant or from plant to stockpile will be minimised.

9.7.3 *Operational Stage*

9.7.3.1 Air Quality

The impact of the proposed development was considered in accordance with regulatory guidance and determined to be imperceptible. Therefore, no additional mitigation is required to further reduce operational impacts on air quality.

9.7.3.2 Odour

The odour abatement unit installed in the MRF will effectively mitigate potential effects of odorous emissions. The emissions will be regulated by and Industrial Emissions Licence issued by the EPA and the emission limit values applied in the odour impact assessment are typical of levels set in EPA Licences.

9.7.3.3 Fire Safety

The fire safety and emergency response measures that will be implemented in the operational stage to mitigate the risk of fire outbreak and, if one does occur, to ensure the appropriate response actions are taken to ensure the fire is extinguished as quickly as possible so as to minimise the adverse environmental impacts are detailed in Section 10.8.3.1.

9.8 Monitoring

9.8.1 *Construction Stage*

If required by the planning authority dust deposition monitoring will be carried out in the construction stage at locations and frequencies specified by the planning authority. The monitoring will be carried out using Bergerhoff gauges specified in the German Engineering Institute VDI 2119 document entitled 'Measurement of Dustfall Using the Bergerhoff Instrument' (Standard Method).

The gauges will be set up such that the containers are approximately 2m above the ground surface. To inhibit the growth of algae, 10ml of copper sulphate will be added to each jar. The monitoring period shall be between 28 and 32 days. The deposition limit will be 350 mg/m2/day.

9.8.2 *Operational Stage*

The emissions from the odour control unit will be monitored at the frequencies set in the EPA licence to demonstrate compliance with the emission limits. The odour control unit will be inspected regularly to ensure it is operating effectively. Dust deposition monitoring will be carried out at locations and frequencies specified by the EPA. At a minimum, this will include three locations inside the EPA licence boundary at quarterly intervals.

9.9 Cumulative Impacts

9.9.1 *Construction Stage*

A review of South Dublin County Council's interactive planning map indicates that there are currently a number of planning applications that has been approved for a development that would involve construction activities in close proximity to the site.

The construction phase of seven approved development could potentially overlap with overlap with the construction phase of the proposed development including:

- SD23A/0135 – A warehouse expansion 600 m north of site
- SD23A/0071 – A change of use to recycling facility 840 m east of site
- SD23A/0025 – A new TII bus interchange 1.2 km northwest of site
- SD22A/0099 – 5 warehouses and ancillary office units - Adjacent to northeastern site boundary
- SD23A/0127 – Alterations to Reg. Ref. SD22A/0099 including car parking alterations adjacent to northeastern site boundary
- SD23A/0179 – 3 light industrial units additional to Reg. Ref. SD22A/0099 masterplan 50 m north east of site
- SD21A/0213 – Additional bus depot parking for Go Ahead Ireland 350 m north of site boundary

The implementation of the CEMP for the proposed development will ensure that levels of impact identified in the assessment of construction in combination with the construction phase of neighbouring developments will be maintained at levels that are imperceptible, negative and temporary

9.9.2 *Operational Stage*

9.9.2.1 Air Quality

The nature of the proposed development, involving waste handling and recycling activities has the potential to impact on air quality at the operational phase due to traffic associated with the proposed development. The potential impact of the operational phase of the proposed develop on air quality was found to be imperceptible, negative and long-term.

Considering that baseline levels of air quality in the study area are well below regulatory limits, the potential impact of the operational phase of the proposed develop on air quality in combination with baseline levels of air quality was therefore also found to be imperceptible, negative and long-term.

9.9.2.2 Odour

Baseline levels of odour in the industrial areas of the site do not appear to result in odour nuisance as there were no odour complaints recorded against any of the other six EPA licensed facilities operating within 1 km of the site in 2022. This indicates that odour levels in close proximity to each of these sites is at acceptable levels. Each of these facilities would be required not to cause odour nuisance at their respective site boundaries.

The level of odour perceived from a facility drops rapidly with distance from that facility. Baseline levels of odour in close proximity to the proposed development are therefore likely to be negligible. The cumulative impact of the proposed development in combination with baseline levels of odour in the immediate vicinity of the site are likely to be the same as the impact of the proposed development in isolation. The cumulative impact of the proposed development with baseline levels of odour was therefore determined to be imperceptible, negative and long-term.

9.10 Residual Impacts

9.10.1 *Construction Stage*

The implementation of the CEMP will ensure that levels of impact identified in the assessment of construction impacts will be minimised to levels that are negative, imperceptible, local, not likely and temporary.

9.10.2 *Operational Stage*

9.10.2.1 Air Quality

The results of the traffic modelling assessment indicate that the impact of the operational stage on human health will be negative, imperceptible, local, likely and long-term. In relation to ecological sites the impact will be negative, imperceptible, not likely and long-term.

9.10.2.2 Odour

The assessment of effects of odorous emissions exhausted from the odour control unit through a ventilation stack was undertaken in accordance with the methodology described in Section 9.3.3.1.

Predicted ground-level concentrations of odour (1-hour average, 98th percentile) are presented here as:

- Concentrations of odour at modelled receptors in Table 9.31
- A contour plot illustrating the concentrations of odour on a cartesian grid around the site in Figure 9.1

The results show that predicted concentrations comply with the odour criterion recommended by EPA for waste facilities of 1.5 ou_E/m^3 at all sensitive receptors included in the modelling assessment. The results also show that operation of the OCU will ensure that levels of impact identified in the assessment in terms of odour will be minimised to levels that are imperceptible, negative and long-term.

Table 9-31 Highest predicted ground-level concentrations of odour (1-hour 98th percentile) for each discrete modelled location in any of the five modelled years included in the dispersion modelling assessment due to the MRF

Receptor ID	1-hour 98th Odour Concentrations (ou_E/m^3)
	Maximum 5-year
DR1	0.1
DR2	0.4
DR3	0.2
DR4	0.7
DR5	1.3
DR6	1.1
DR7	1.2
DR8	0.1

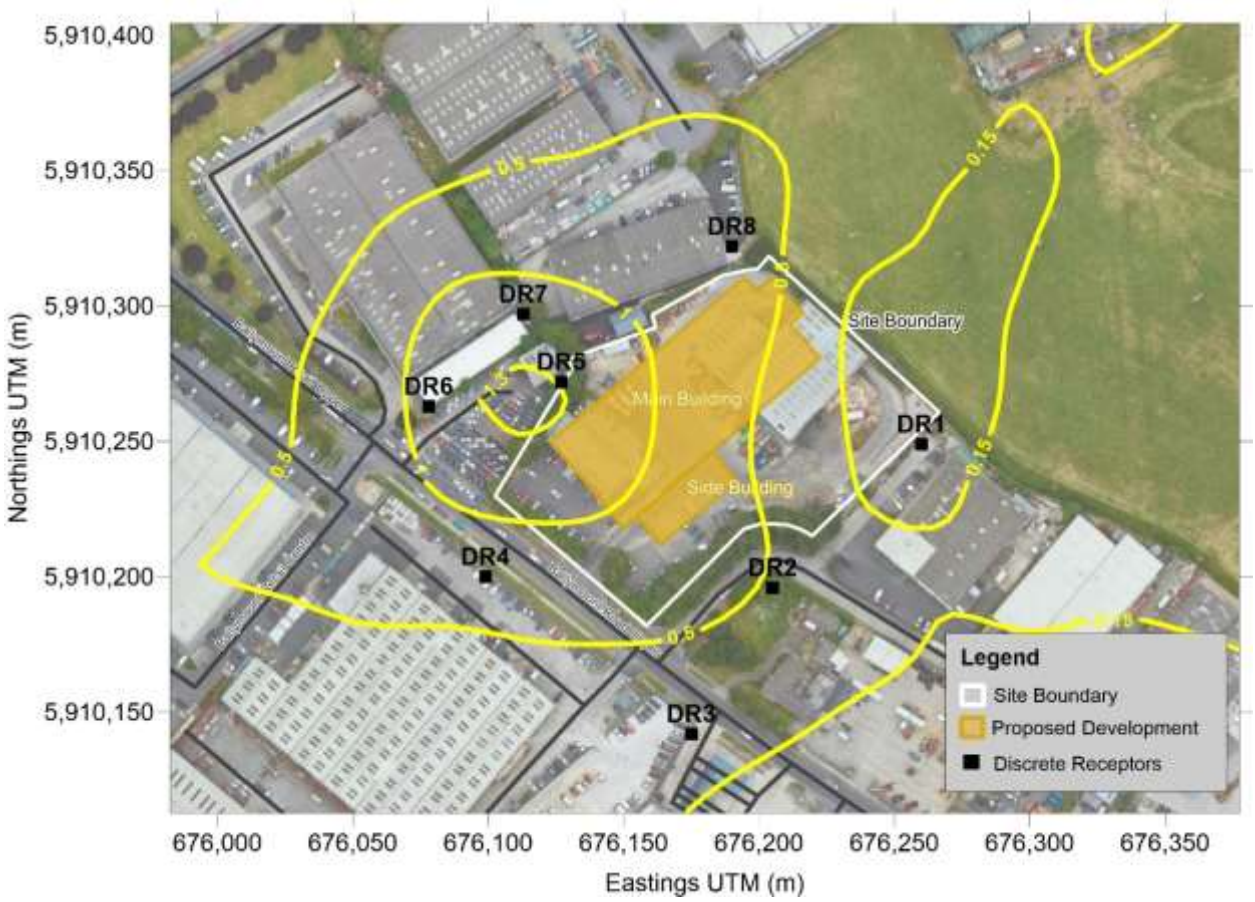

Figure 9-8 Highest predicted ground-level concentrations of odour (1-hour 98th percentile) in any of the five modelled years included in the dispersion modelling assessment due to the MRF

9.10.3 *Summary of Impacts*

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Construction Stage					
Air Quality	Negative	Imperceptible	Local	Likely	Long Term
Operational Stage					
Air Quality Human Receptors	Negative	Imperceptible	Local	Likely	Long Term
Air Quality Ecological Receptors	Negative	Imperceptible	At the Sites	Not Likely	Long Term

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10. POPULATION & HUMAN HEALTH

10.1 Introduction

This Chapter assesses the impacts of the proposed development on the population and human health. The assessment considered a 'baseline' scenario and identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts. This Chapter should be read in conjunction with Chapter 9 Air and Chapter 14 Materials Assets Traffic & Transport.

"Human health" is not defined in the EIA Directive; however the term "human health" is contained in both the Strategic Environmental Assessment Directive (2001/42/EC) and EIA Directive and a common interpretation can be assumed. Therefore the consideration of human health effects resulting from the construction and operation of a project should focus on health issues arising in the context of the other relevant environmental factors listed in Article 3 of the Directive[9], namely:

- Population
- Biodiversity, with particular attention to protected species and habitats
- Land, soil, water, air and climate
- Material assets, cultural heritage and the landscape
- Interactions between the above factors

The EIA Directive and transposing regulations do not generally require assessments of land-use planning, demographic issues or detailed socio-economic analysis and these should be avoided in an EIAR, unless issues such as economic or settlement patterns give rise directly to specific new developments and associated effects[10]. Given the nature of the proposed development these aspects have not been considered.

This Chapter was prepared by Dr Martina Gleeson PhD of OCM, with assistance from Mr Damian Brosnan MSc of MKO Ireland who prepared a Noise and Vibration Impact Assessment for the proposed development, a copy of which is in Appendix 10.1. Dr Gleeson has a BSc in Environmental Geochemistry and a PhD in Geochemistry. She has over 15 years' experience of environmental impact assessment and, managing environmental monitoring contracts at EPA licensed sites including the preparation of interpretive reports on air quality and noise impact assessments.

Mr Brosnan holds a BSc, Diploma in Acoustics and Noise Control, MSc in Applied Acoustics and is a Member of the Instituted of Acoustics (MIOA) and a founding member of the Association of Acoustic Consultants of Ireland (AACI) who has over 20 years' experience in scoping and carrying out noise and vibration impact assessments.

[9] • Government of Ireland Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018).

[10] Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2017).

10.2 Relevant Regulations and Guidance

The general EIA legislation and guidance documents are listed in Section 1.5. The guidelines relevant to Population and Human Health considered in the preparation of this Chapter include the South Dublin Noise Action Plan 2019-202 and the guidance documents on noise referenced in Section 1.4 of the MKO Report in Appendix 10.1.

10.3 Methodology

The assessment was based on the land use and settlement patterns in the vicinity of the proposed development. Information was derived from databases maintained by the Central Statistics Office (CSO), the South Dublin County Development Plan 2022 to 2028; Chapter 9 Air, Chapter 14 Traffic & Transport; a Noise & Vibration Assessment completed by MKO (Appendix 10.1); and a Glint and Glare Assessment completed by MacroWorks (Appendix 10.2).

10.4 Proposed Development

Chapter 3 provides a detailed description of the proposed development. Those aspects of the relevant to Population & Human Health include the land use in the vicinity of the development site; local amenities; Tallaght University Hospital Solar Safeguarding Zone for its helipad; emissions during the construction and operational stages with the potential to directly and indirectly impact on human health, for example air emissions and noise, and potential sources of nuisance (e.g. odours and traffic congestion).

10.5 Receiving Environment

10.5.1 *Surrounding Land Use*

The surrounding land use (Figure 2.2) is a mix of industrial and residential. The adjoining lands to the east and north east are currently used for animal grazing; however planning permission (Ref SD22A/0099) has been granted for the development of 5 warehouse/logistics units (Units 1,2,3,4 and 6) including ancillary office use and entrance/reception areas over two levels; 3 three storey own-door office buildings (Units 5A, 5B and 5C) and a café/restaurant unit (Unit 7).

The proposed development site is located in an extensively industrial area, with commercial and industrial buildings extending for several hundred metres in each direction. The local topography is level. Despite the site's location in an industrial area, there are six dwellings locally, all situated along Ballymount Road Upper to the southeast of the site entrance. Several of these are connected with immediately adjacent commercial activities. The dwellings are shown in Figure 10.1. A dwelling outside the northwest corner of the proposed development site does not appear to be in residential use.

Apart from the six dwellings referenced above, there are no other residential receptors in proximity to the proposed development site. The nearest dwellings are located 400 m to the west, on the western side of the M50 motorway, where a number of residential estates border the motorway. The nearest of several dwellings on Turnpike Road to the northwest lies 430 m from the site. The nearest dwellings to the south are over 600 m from the site. Extensive residential estates to the east and southeast approach to within 700 m of the site at their closest.

All of the sensitive receptors in the local area are dwelling. No receptors such as crèches, schools, care centres or nursing homes have been identified in the local area. Commercial and industrial facilities (including their office spaces) across the surrounding area are not considered noise sensitive locations.

The Tallaght University helipad is situated approximately 2.8km to the southwest of the proposed development site.

Figure 10.1 Local Dwellings in Residential Use

10.5.2 *Amenities*

There are eight schools and crèches within 1.5km of the site. There are several parks within 1km, with football pitches locate approximately 1.2km from the proposed development site being the closest sports facilities. The nearest medical facilities are Tallaght Medical Centre which is 1.2km to the southwest and a nursing home which is 1.4km to the south of the facility.

10.5.3 *Major Accidents and Natural Disasters*

10.5.3.1 Major Accidents

The Seveso II Directive 96/82/EC is concerned with the prevention of major accidents that involve dangerous substances and the limitation of their consequences for humans and the environment. It applies to establishments where dangerous substances are produced, used, handled or stored. The Directive was transposed into Irish law by the "European Communities (Control of Major Accident

Hazards Involving Dangerous Substances) Regulations" SI No 476 of 2000 and the Health and Safety Authority (HSA) is the designated competent authority.

Facilities that are subject to the Regulations are ranked as Upper and Lower Tier Establishments based on their scale. The proposed development will not be subject to the Regulations and the nearest designated facility is the Lower Tier Irish Distillers, approximately 800m to the north.

10.5.3.2 Natural Disasters

The subject site is not in an area at risk of land instability or identified as being at risk of, pluvial, fluvial or groundwater flooding (Re Flood Risk Assessment in Appendix7.1). .

10.5.4 *Noise & Vibration*

The South Dublin County Council noise action plan 2018-2023 includes maps relating to the road network in the vicinity of the site, as required by Directive 2002/49/EC. Round 4 mapping has been completed recently and the noise action plan is currently undergoing review.

Round 4 road traffic noise mapping for the local area is shown in Figures 10.1 and 10.2. Mapped L_{den} levels exceed 55 dB along Ballymount Road Upper. L_{night} levels are generally above 50 dB, and considerably above 60 dB along the M50 corridor.

In the vicinity of the proposed development site, noise levels do not exceed the South Dublin County Council threshold for undesirable high sound levels. While the round 4 maps include mapping of noise contours associated with industrial facilities, it is not clear how these have been calculated, or how such data will be incorporated into future noise action plans.

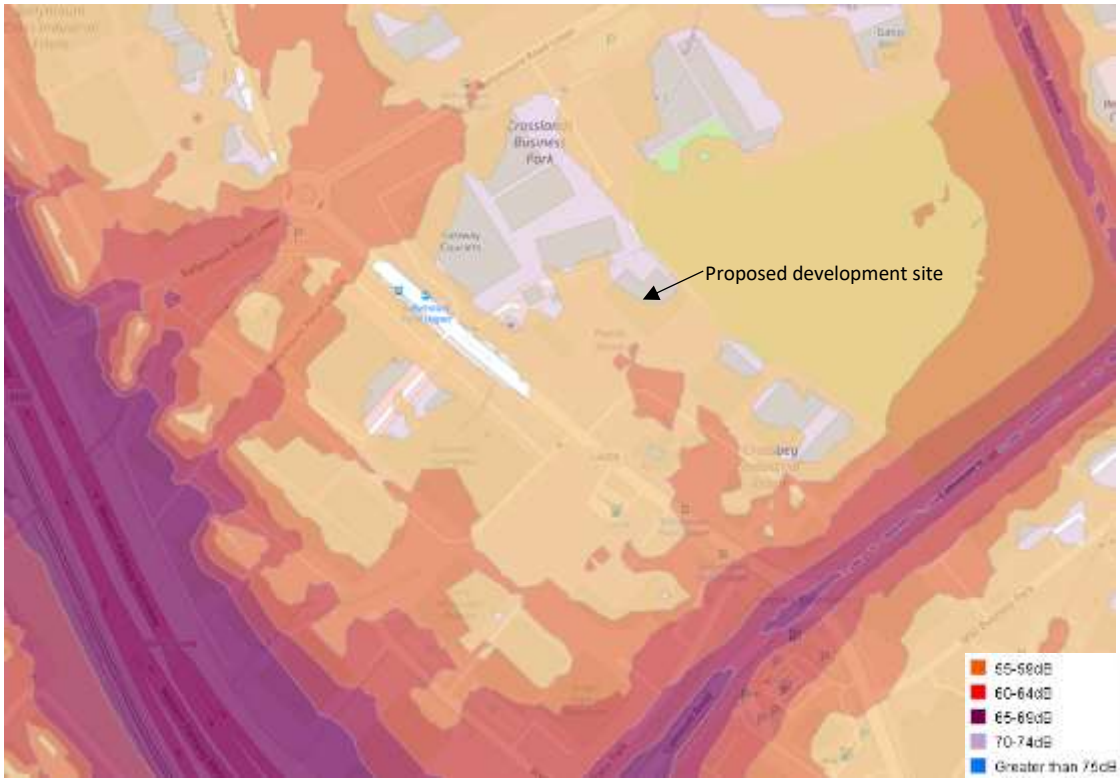


Figure 10.1 Mapped L_{den} Contours

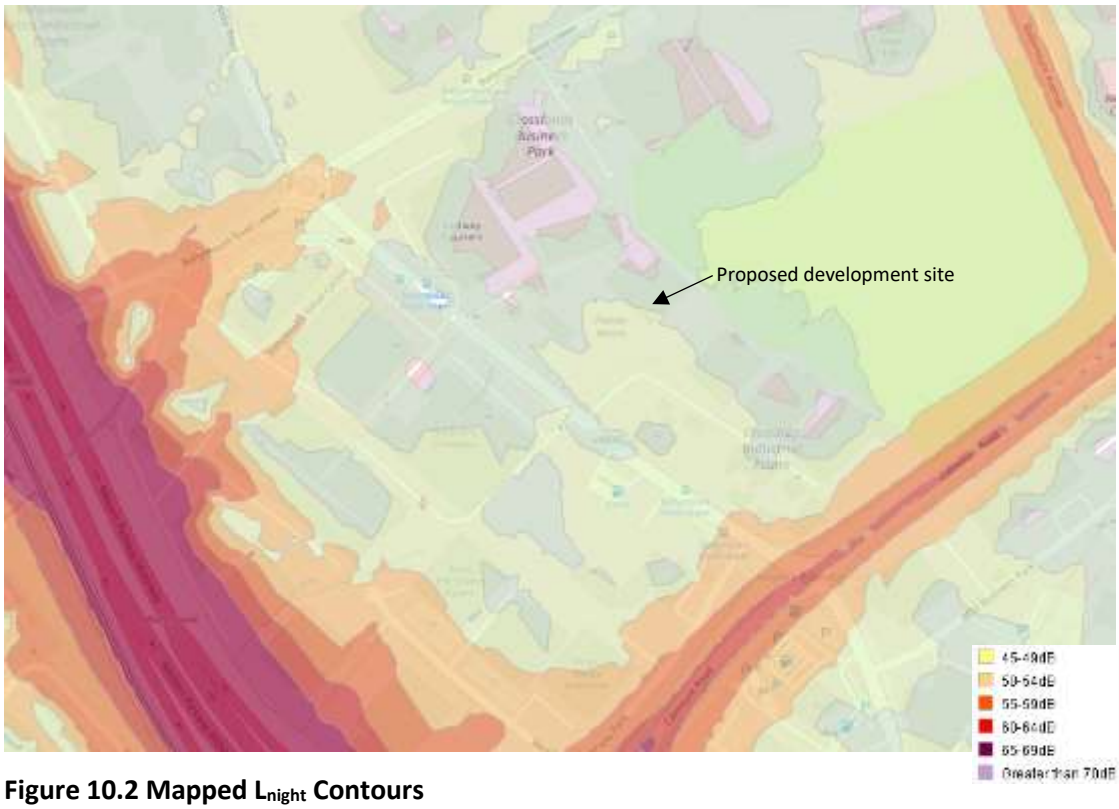


Figure 10.2 Mapped L_{night} Contours

The EPA licence requires annual noise surveys at four monitoring points specified, as shown in Figure 10.3. Noise data measured during the 2020, 2021 and 2022 surveys, the results of which are in Table 8 of the MKO report in Appendix 10.1, indicate that $L_{Aeq\ T}$ levels in the vicinity of the proposed development site are elevated, with $L_{Aeq\ 30\ min}$ levels reaching 62 dB in proximity to Ballymount Road Upper. Night-time levels reach 54 dB. $L_{AF90\ 30\ min.}$ The levels show considerable variation, reaching 58 dB by day and 47 dB by night and the measured noise data at roadside positions are entirely dominated by local and distant traffic.

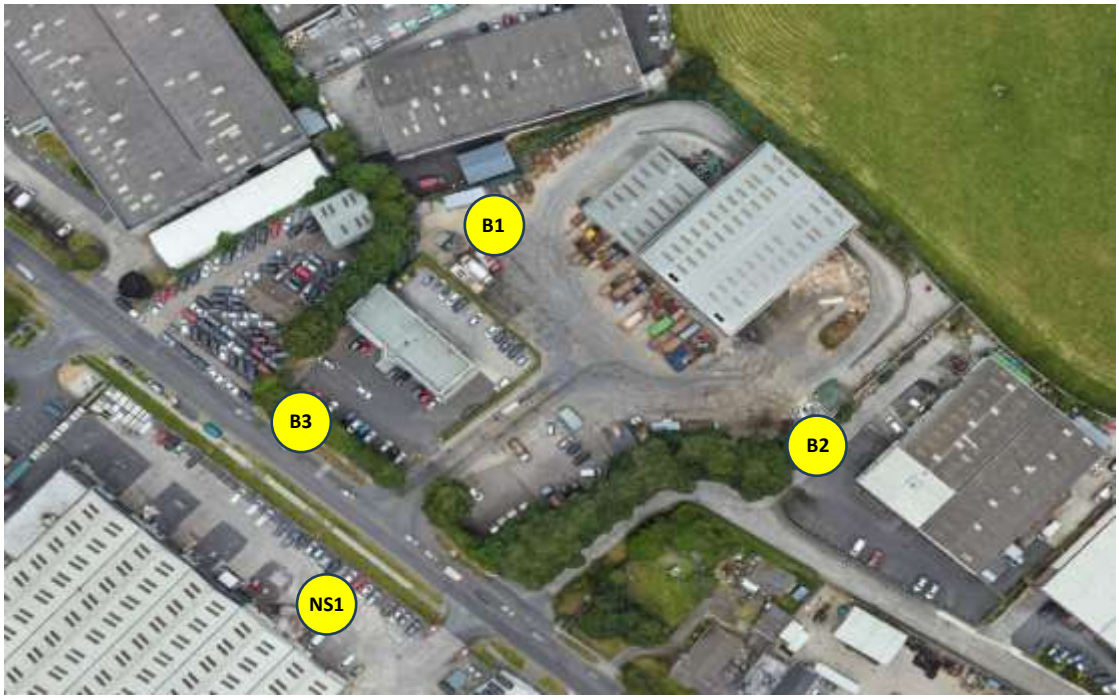


Figure 10.3 Routine Noise Monitoring Stations

To assess current daytime, evening and night-time noise levels in the vicinity of the nearest receptors MKO carried out a noise survey on Thursday 21.09.23, extending into Friday morning 22.09.23 at two positions shown in Figure 10.4. The survey methodology, equipment specifications and weather conditions are described in Section 3.5 of the dBA report in Appendix 10.1, with the noise data presented in Table 11.

Figure 10.4 MKO Noise Monitoring Locations

The soundscape at both stations was entirely dominated by road traffic. At N1, local road traffic gave rise to recurring spikes, with elevated background levels due to continuous M50 traffic. I n contrast, there were no local spikes at N2, and continuous M50 traffic dominated. Other sources audible were aircraft, Luas passes at N2, and an alarm event at N1. No emissions were audible from the applicant's existing operation. Measured noise levels were elevated at both positions, reflecting the dominance of local traffic noise adjacent to Ballymount Road Upper, and continuous M50 intrusion in the background.

The dominance of distant traffic is reflected in the relatively high noise levels measured, in particular the elevated LAF90 30 min levels. Daytime and evening LAF90 30 min levels exhibit a narrow range, suggesting little or no break in distant traffic. Night-time levels show a wider range, attributable to occasional lulls in traffic. Lden and Lnight levels measured across all three stations are relatively high.

The noise levels at all three stations, measured levels are lower than mapped levels in the Fingal Noise Action Plan (Figures 10. 4 and 10.5). The most likely explanation is that the northeast and northwest breezes prevailing during the survey significantly minimised M50 traffic noise levels, and it was noted during the survey that N2 traffic noise masked M50 traffic noise. In contrast, the Noise Action Plan mapping indicates that M50 noise contours ordinarily exhibit a considerably wider corridor than N2 contours.

10.5.5 *Air Quality*

The development site is in an area that that has been extensively developed for industrial and commercial use and mineral extraction. The assessment of the impact of the development on air quality (Chapter 9) has established that the baseline air quality in the vicinity of the site is good.

10.5.6 *Traffic*

The facility is accessed via the Ballymount Road Upper. Calmount Road runs north-east from Junction 10 on the M50 to Ballymount Road Upper. It has two lanes in both directions and a speed limit of 60km/hr. The site is on Ballymount Road Upper, which connects Calmount Road with Ballymount Road Lower. It is a single carriageway road with a speed limit of 60km/hr and provides access to the businesses located on both sides of the road. The Calmount Road / Ballymount Road Upper junction is a non-signalised roundabout, where the layout does not allow east to west movements onto Ballymount Road Upper.

10.6 **Impacts**

Given the location of the proposed development site and the surrounding land use, there will be no impacts on the existing amenities within the study area. Impacts on Population and Human Health are linked to noise and air emissions in both the construction and operational stages and potential nuisance in the operational stage

10.6.1 *Construction Stage*

In the construction stage (approximately 14 months) in the absence of mitigation noise, air emissions and construction related traffic have the potential to result in localised, if temporary, nuisance. Construction stage impacts on air are described in Section 9.5.1 and construction related traffic is described in Section 14.6 of this EIAR.

10.6.1.1 Noise & Vibration

Noise

The chief source of noise emissions will be the plant and equipment used onsite. The emissions will vary considerably due to:

- Relocation of plant around the site as required;
- Different plant items will be required at different times, and construction operations will vary on a daily basis;
- Each plant item may operate under different loading conditions or be in varying states of repair;
- Construction works may be concentrated for certain periods, followed by periods of inactivity;
- Localised works may require several hours of intense activity, and
- During the later stages of the construction phase, emissions from some operations will be screened by previously completed structures.

With respect to noise sensitive receptors, the 'worst case' scenario emissions will arise when works are undertaken close to their respective boundaries. An 'extreme worst case' scenario consists of construction activity simultaneously occurring at the nearest points to offsite receptors, involving plant with the greatest noise output.

MKO modelled the extreme worst case scenario (Sections 4.2 of the MKO Report in Appendix 10.1), which included:

- Demolition stage, involving an excavator with a breaker attachment, a second excavator, and occasional truck movements.

- Ground works involving a tracked excavator, vibro-roller, dumper and sporadic truck movements, with a second excavator ripping rock to enable installation of the underground attenuation tank.

- Building construction works, involving a discharging concrete mixer truck, a mobile elevated working platform, a crane, a mobile generator, a telescopic handler, and sporadic truck movements.

Apart from one case, LAeq 1 h levels will remain below the 65 dB BS 5228:2009 criterion at all receptors throughout the construction phase. The single exception relates to the nearest dwelling outside the southeast corner of the site, where demolition works will reach 69 dB at their highest. This activity will be short-term, lasting several days at most. The predicted 69 dB level will not exceed the 70 dB criterion recommended by the National Roads Authority.

On this basis, construction phase noise levels are unlikely to be intrusive. Construction phase noise impacts are expected to be temporary and slight adverse at the nearest dwelling, decreasing to temporary and imperceptible to not significant at other dwellings.

BS 5228:2009 source noise data suggest that construction phase emissions will not be tonal. Apart from concrete breaking, emissions are also unlikely to be impulsive. Breaking will be required over several days, estimated at 1-3 days. Due to masking by road traffic, construction phase noise is likely to be inaudible at distant dwellings, and slightly audible at intervals at the nearest dwellings on Ballymount Road Upper.

During the construction phase, vehicles will arrive at, and depart from, the site during the working day. Vehicle movements will be associated with workers' arrival and departure, removal of demolition waste, and delivery of materials. The approximate numbers of workers employed onsite over the entire construction period will fluctuate depending on schedules. Numbers are unlikely to exceed 60 at any time.

The traffic impact assessment chapter indicates that construction works will result in a temporary increase in HGV traffic volumes of 7 % or less. It follows that construction traffic volumes will be inconsequential in the context of existing traffic volumes on Ballymount Road Upper and the surrounding road network, and also lower than traffic volumes associated with the applicant's existing onsite waste management operation. Therefore construction stage traffic noise impacts will be neutral.

Vibration

Delivery truck movements may give rise to vibration at positions adjacent to the road. However, such emissions are typically imperceptible beyond 10 m, and are highly unlikely to be perceptible at dwellings alongside site access routes. Ballymount Road Upper is currently subject to a large number of daily truck movements.

The on-site movement of plant is not considered to constitute a source of groundborne vibration and is not listed in typical vibration documents such as BS 5228-2:2009. In addition, plant machinery used onsite is likely to be small to mid-sized, and similar to those used on other urban construction projects.

Excavation of trenches and pits for foundation and services will be required. These activities are not typically associated with off-site groundborne vibration impacts. Piling is not proposed and in addition, rock breaking is unlikely to be required.

While vibro-rolling will generate high levels of vibration at the point of operation, experience at other sites indicates that such vibration is typically immeasurable beyond 50 m.

Excavation of trenches and pits for foundations, services and a stormwater attenuation tank will be required. These activities are not typically associated with offsite groundborne vibration impacts. Piling is not proposed.

Concrete breaking and rock breaking, if required will be undertaken using a hydraulic breaker mounted on a tracked excavator. Although this may give rise to relatively high levels of ground vibration in proximity to the breaking area, the vibration tends to contain relatively little energy in the lower frequencies at which buildings and occupants are most vulnerable. In addition, higher frequencies attenuate more rapidly than low frequencies, thus minimising the impact zone.

On the basis of the foregoing peak particle velocity levels at all receptors are expected to be considerably lower than relevant human threshold and building and structural integrity criteria, and indeed are expected to be below measurement threshold. It follows that construction operations are unlikely to be either perceptible offsite, or to cause cosmetic or structural damage to buildings.

10.6.2 *Operational Stage*

10.6.2.1 Odour

The residual MSW and brown bin wastes are odorous and, in the absence of mitigation, could be a source of odour nuisance outside the development boundary.

10.6.2.2 Noise

The MRF will operate 24/7. The noise emission sources will include trommels, shredders, optical separators, magnets, eddy current separators, wind sifters, picking lines, compactor units and bale wrapping units. A mobile grab, front end loader and a telescopic loader will be used to move the materials. Negative air pressure will be maintained in the building using an air management system that includes an air extraction fan. Vehicle movements will also arise on a 24/7 basis, subject to permission, although traffic movements during the evening and night-time will be sporadic.

Initial modelling completed by MKO identified the need for an acoustic barrier along the southeast boundary to attenuate noise emissions propagated towards the nearest dwelling. This is particularly relevant with respect to HGV movements during evening and night-time hours. The proposed barrier will be 4 m high, entirely solid without panel gaps and constructed using insulated cladding on a steel framework to provide a minimum of 10 dB transmission loss. The barrier was incorporated into predictive noise modelling described below

For the purposes of predictive modelling MKO identified three scenarios:

- Daytime: Waste management operations underway in the building, with the grab, front end loader and telescopic loader all in use. Air management system operating continuously. 60 HGV movements per hour assumed.

- Evening: As during the daytime, with HGV movements reducing to 10 movements per hour.

- Night-time: As during the evening, with HGV movements further reducing to 5 per hour.

MKO completed the predictive noise modelling assessment of the operational phase using three different methodologies (Ref Section 4.5 of the MKO Report in Appendix 10.1). The first was based on criteria recommended by the EPA and established that the proposed development will comply with EPA criteria at the nearest dwellings and will also comply at more distant dwellings.

The second method was based on British Standard 4142:2014, which provides for the comparison of specific LAeq T levels (i.e. noise levels attributable to the source in question) with background levels. This established that in all cases, operational noise levels will be lower than background levels, which at all receptors are dominated by road traffic.

The third method was an assessment of the increase in LAeq 30 min levels arising from the proposed development in line with Institute of Environmental Management and Assessment (IEMA) guidance. This concluded that in all cases, impacts will be imperceptible, again due to high existing baseline noise levels resulting from road traffic.

All vehicles will access the site from Ballymount Road Upper. Existing traffic movements, including HGV movements, are elevated on Ballymount Road Upper due to traffic associated with facilities across the wider commercial area. The road traffic assessment indicates that increases in local road traffic resulting from the proposed development will not be significant.

The proposed development represents a continuation of the existing waste management operation onsite, albeit with a 133 % increase in HGV movements. The resulting increase in noise level will be 4 dB, which represents a not significant to slight negative impact. The increase will be negligible in the context of Ballymount Road Upper traffic volumes. The traffic assessment indicates that development-related HGV traffic will constitute less than 15 % of overall HGV traffic locally, and it is concluded that traffic noise impacts will be contextually imperceptible.

10.6.2.3 Glint & Glare

Solar/PV panels will be provided on roofs of the building. MacroWorks undertook a Glint and Glare Assessment to assess the risks to users of the helipad at Tallaght University Hospital. This determined that the roof top panels did not present any significant risk to aviation safety. A copy of the Macroworks report is in Appendix 10.2

10.6.2.4 Nuisance

In addition to odour and noise, and in the absence of mitigation, the waste processing activities have the potential be a source of off-site nuisance and impairment of amenity linked to litter, traffic, vermin and birds.

10.6.2.5 Fire

A major incident such as a fire presents a risk to site staff and there is the potential, depending on the weather conditions, for smoke to affect the occupants of the residential, industrial and commercial properties in the vicinity of the site.

10.7 Likely Future Receiving Environment

10.7.1 *Noise*

The local noise environment is urban in character, being entirely dominated by local and M50 road traffic noise on a 24/7 basis. Traffic volumes are likely to continue to increase into the future, resulting in gradually increasing noise levels. While engine noise emissions will reduce due to increasing take-up of electric vehicles, it is noted that traffic noise above 50 km/h arises chiefly from tyre noise and is thus unaffected by engine type. Thus the increasing proportion of electric vehicles in the national car fleet is unlikely to result in a decrease in traffic noise levels across the study site, particularly in relation to M50 noise.

Noise levels in the local area surrounding the proposed development site may increase marginally following completion of five warehouses currently under construction on a plot to the immediate east of the site.

With respect to the development site itself, it is expected that, should the proposed development not proceed (the 'do nothing' scenario), noise emissions will continue to arise from the existing onsite waste management operation, as licensed by the EPA.

10.7.2 *Air Quality*

In the absence of the proposed development, air quality at the site will remain at baseline levels. Baseline air quality levels at the site will change with time in line with general trends in air quality for the site and the wider surrounding area.

10.7.3 *Potential Nuisance*

In the absence of the proposed development the existing waste management activity will continue, with no change to the potential for nuisance associated with operations.

10.8 Prevention & Mitigation Measures

10.8.1 *Design Stage*

10.8.1.1 Odour

An odour control system designed to ensure that odour emissions from the processing of odorous waste inside the building will not be a source of off-site nuisance will be installed.

10.8.1.2 Noise

The preliminary noise modelling stage identified the need for an acoustic barrier along the southeast boundary to attenuate noise emissions propagated towards the nearest dwelling. This is particularly

relevant with respect to HGV movements during evening and night-time hours. The barrier will be 4 m high, entirely solid without panel gaps and constructed using insulated cladding on a steel framework to provide a minimum of 10 dB transmission loss (Ref Drawing No. 221244-ORS-Z0-00-DR-AR-206).

10.8.1.3 Fire Safety

To prevent/reduce risk of arson there will be a security fence around Phase and the entrance gate will be locked during non-operational hours. Emergency exit doors will be provided in all of the buildings and fitted with emergency exit signs with back-up lighting.

An automatic fire detection (for example ceiling mounted heat and smoke detectors) and alarm system certified to IS 3218 will be installed in both buildings that covers all internal areas, supplemented by a manual break glass system.

The ring main will be fitted with six hydrants that comply with the Uisce Eireann Water Infrastructure Standard Details (STD-W-19).

Internal separation distances between materials storage areas/bays will comply with the requirements of the EPA Guidance Note: Fire Safety at Non-Hazardous Waste Transfer Stations, (2013) and the EPA Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, 2016.

10.8.2 *Construction Stage*

10.8.2.1 Air

Dust emissions are likely to arise from earthworks, wind blow from temporary soil stockpiles; construction traffic movements; handling of construction materials and landscaping. Given the distance between the site and the nearest sensitive receptor there is no risk of dust soiling causing a nuisance; however the following control measures will be implemented at a minimum:

- Spraying of exposed earthworks, soil stockpiles and site haul roads during dry weather using mobile bowser units;
- Provision of a wheel cleaner at the site entrance road to remove soil from vehicles before they leave the site;
- Paved roads will be regularly swept to remove mud and debris and traffic movements on non-paved areas will be restricted to essential site traffic;
- Control of vehicle speeds;
- Material drop heights from plant to plant or from plant to stockpile will be minimised and
- The access junction of Ballymount Road Upper will be inspected daily for cleanliness and cleaned as required using a mechanical road sweeper.

The following mitigation measures will be implemented to minimise the impacts of vehicle exhaust emissions:

- Construction materials will where possible be sourced locally so as to minimise transport distances;

- Engines will be turned off when machinery is not in use, and
- Regular maintenance of vehicles, plant and equipment.

10.8.2.2 Noise

The will be no vibration impacts and although noise emissions will be short term, and will not exceed the applicable noise criterion, the following mitigation measures will be implemented:

- Construction operations will in general be confined to the periods Monday-Friday 0700-1900 and Saturday 0800-1400, unless otherwise agreed with Fingal County Council.
- Drivers of plant and vehicles will be instructed to avoiding hooting at all times.
- Plant items will be maintained in a satisfactory condition and in accordance with manufacturer recommendations. In particular, exhaust silencers will be fitted and operating correctly at all times. Defective silencers will be immediately replaced.
- Queuing of trucks on Ballymount Road Upper will be prohibited.
- Machinery not in active use will be shut down.
- A site representative will act a liaison officer with the local community and all noise complaints will be logged in a register, and investigated immediately. Details of follow-up action will be included in the register.
- Where it is proposed to import potentially noisy plant to the site, the potential impact of noise emissions will be assessed in advance.
- Guidance set out in British Standard BS 5228:2009 with respect to noise control will be applied throughout the construction phase.

10.8.3 *Operational Stage*

10.8.3.1 Fire Safety

Members of the public will not have access to the facility and only authorised personnel will be permitted inside the waste processing buildings. Site visitors will be informed of the safety and fire prevention procedures that must be followed while they are on site. There will be a policy of only smoking in designated areas.

Safe systems of work will be provided and outside contractors will be obliged to undergo safety inductions before being allowed access operational areas. The inductions will address behaviour on site, housekeeping and specific high risk jobs i.e. hot works procedures & permits.

The use of portable electrical heaters will be prohibited and the electrical systems in the buildings will be subject to regular inspections.

Inside the building the internal separation distances between materials storage areas/bays will comply with the requirements of the EPA Guidance Note: Fire Safety at Non-Hazardous Waste Transfer Stations, (2013) and the EPA Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, 2016.

Fire extinguishers will be positioned at strategic locations throughout the site and the locations recorded in Fire Register. The extinguishers will be subject to annual inspection and replenishment/replacement as required by a fire safety contractor. Site staff will be trained to extinguish small fires with appropriate hand held fire. If staff members cannot tackle a fire safely and effectively, the evacuation of all personnel will be the primary priority.

The current ERP will be revised and updated to that describes the actions that will be taken in the event of a fire outbreak to ensure it is contained and extinguished as soon as is practical.

10.8.3.2 Noise

As the impacts at offsite receptors will be imperceptible, site specific mitigation measures are required; however the following general measures will be implemented:

- The building will be constructed so as to avoid any gaps at cladding joints;
- Prior to selection of the air management system and odour control unit, noise emissions data shall be assessed to ensure that emissions are entirely broadband in character;
- All mobile plant will be fitted with flat spectrum reversing alarms;
- Hooting will be prohibited onsite. Drivers of plant and vehicles will be instructed to avoiding hooting at all times;
- Plant and equipment will be maintained in a satisfactory condition and in accordance with manufacturer recommendations, and
- All noise complaints received will be logged in a register, and investigated immediately. Details of follow-up actions will be recorded in the register.

10.8.3.3 Odour

The current Odour Management Plan (Appendix 2.2) will be revised and updated to identify all the potential sources of odours and specify the control measures that will be implemented to effectively mitigate odour nuisance, which will include:

- All materials acceptance and processing will be carried out inside the building;
- The doors on the section of the building where odorous materials are handled will be kept closed and only opened to allow vehicles to enter and leave the building;
- Odorous materials will typically be sent off-site within 24 hour of arrival and in any event within 72 hours, and
- Regular cleaning of the floor of the section where the odorous wastes are handled.

The odour management system will be the subject to a regular preventative maintenance programme to ensure it operates effectively. Stocks of the carbon filter media will be kept on site to minimise downtime of the system when it has to be replaced.

10.8.3.4 Nuisance

In addition to the measures to mitigate odour nuisance the following will be implemented:

- Daily litter patrols;
- Continued retaining a pest controller to implement appropriate pest and vermin control measures as required, and
- During periods of dry weather the paved yards will be damped down with water to prevent windblown dusts.

10.9 Monitoring

10.9.1 *Construction Stage*

If required noise surveys and dust deposition monitoring will be carried out at agreed locations and frequencies, and the results submitted to SDCC.

10.9.2 *Operational Stage*

The emissions from the odour control unit will be monitored at the frequencies set in the revised EPA licence to demonstrate compliance with the emission limits. The odour control unit will be inspected regularly to ensure it is operating effectively.

Dust deposition monitoring will be carried out at locations and frequencies specified in the revised EPA licence. At a minimum this will include three locations inside the EPA licence boundary at quarterly intervals.

Noise monitoring will be carried out at the locations and frequencies specified in the revised EPA licence.

The discharge to the foul sewer will be monitored in accordance with the conditions of the revised EPA licence.

All monitoring results will be reported to the EPA and will be publically accessible.

10.9.2.1 Fire Safety

The fire detection system will be subject to annual checks by a fire safety contractor. The alarm will be remotely monitored by a security company and if activated outside of operational hours the security company will notify the emergency services and nominated site personnel.

The fire extinguishers will be subject to annual inspection and replenishment/replacement as required by a fire safety contractor.

10.10 Cumulative Impacts

10.10.1 *Air Quality*

In the construction stage the implementation of the CEMP for the proposed development will ensure that levels of impact identified in the assessment of construction in combination with the construction phase of neighbouring developments will be maintained at levels that are negative, imperceptible, local, likely and temporary.

In the operational stage, considering that baseline levels of air quality in the study area are well below regulatory limits, the potential impact of the operational phase of the proposed develop on air quality in combination with baseline levels of air quality will be negative, imperceptible, local, likely and long-term.

10.10.2 *Noise*

The baseline noise monitoring established that the local soundscape is entirely dominated by road traffic noise. While a number of commercial and industrial noise sources are located in the surrounding area, noise emissions from these represent a minor contributor to the soundscape. Receptors directly bordering certain premises may be influenced by intermittent yard activity at such premises – this chiefly applies to three dwellings near the roundabout to the southeast of the site, all of which are located in close proximity to commercial operators, including operators within the curtilage of the dwellings.

Predictive noise modelling indicates that noise emissions from the proposed development will be lower than baseline noise levels at receptors and thus cumulative impacts will not arise. This conclusion applies during daytime, evening and night-time hours. Baseline noise levels remain elevated through the night, thus masking emissions from the proposed development. It is further noted that most, if not all, surrounding operators do not operate during night-time hours, further minimising the possibility of cumulative impacts. While there is a possibility that night-time HGV movements may occur at the warehouses under construction to the east, there are no receptors in immediate proximity to same.

Given (a) the dominance of road traffic noise, (b) the minimal impact from existing operators, and (c) the negligible impact from the proposed operation, the proposed development will not give rise to any cumulative noise impacts of significance.

10.10.3 *Traffic*

The cumulative impacts of the proposed development on traffic in conjunction with the existing activities in the vicinity of the development area and permitted projects whose construction have the potential to overlap with the proposed development are assessed in Section 14.9 of this EIAR.

10.11 Residual Impacts

10.11.1 *Construction Stage*

At intervals during the construction phase, the loudest construction activity is likely to be audible at the nearest dwelling, outside the southeast boundary. During the 1-3 days when concrete breaking is undertaken, noise emissions are likely to be audible at this dwelling, as well as five other dwellings between the site and the roundabout to the southeast. Emissions will be inaudible at all other

receptors. While audible at the nearest dwellings, construction noise will not exceed the 65 dB criterion, although concrete breaking will see a temporary increase to 69 dB at the nearest dwelling.

The construction stage will have a negative, not significant, local, likely and temporary impact on Population and Human Health.

10.11.2 *Operational Stage*

The waste processing will have a negative, imperceptible, local, likely and permanent impact. Noise from traffic associated with the proposed development will have a negative, imperceptible during daytime hours/not significant during night-time hours, local likely and long term impact on the nearest residential dwelling.

10.11.3 *Summary of Residual Impacts*

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Construction Stage					
Human Health Noise	Negative	Not Significant	Local	Likely	Short Term
Human Health Vibration	Neutral	Imperceptible	Local	Unlikely	Short Term
Human Health Air Quality	Negative	Imperceptible	Local	Likely	Long Term
Operational Stage					
Human Health Air Quality	Negative	Imperceptible	Local	Likely	Long Term
Human Health Noise	Negative	Imperceptible to Not Significant	Local	Likely	Medium Term
Amenity	Positive	Slight	Local	Likely	Long Term

10.12 **References**

Report RI 8507: Structural response and damage produced by ground vibration from surface mines blasting (US Bureau of Mines, 1980).

British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration (1993).

International Standard ISO 9613-2:1996 Acoustics: Attenuation of sound during propagation outdoors – Part 2 General method of calculation (1996)

Guidelines on community noise (World Health Organisation, 1999).

Directive 2002/49/EC of the European Parliament and of the Council relating to the assessment and management of environmental noise (2002), transposed into Irish law by the European Communities (environmental noise) Regulations 2018 (SI no. 549/2018).
Night noise guidelines for Europe (World Health Organisation, 2009).

Design manual for roads and bridges (UK Highways Agency, 2011).

British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (2014).

British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (2014).

Good practice guidance for the treatment of noise during the planning of national road schemes (National Roads Authority (now Transport Infrastructure Ireland), 2014).
Guidelines for environmental noise impact assessment (Institute of Environmental Management & Assessment, 2014).

NG4 Guidance note for noise: Licence applications, surveys and assessments in relation to scheduled activities (EPA, 2016).

International Standard ISO 1996-2:2017 Acoustics – Description, measurement and assessment of environmental noise, Part 2: Determination of environmental noise levels (2017).

Noise action plan for South Dublin County Council 2019-2023 (2018).

British Standard BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (2019).

11. LANDSCAPE & VISUAL IMPACT

11.1 Introduction

This Chapter provides an assessment of the visual impacts of the proposed development on the landscape and visual amenity, which includes a 'baseline' scenario. It identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts. The Chapter should be read in conjunction with Chapter 8 Biodiversity and Chapter 10 Population & Human Health.

This Chapter was prepared by Mr Jim O'Callaghan of OCM. Mr O'Callaghan holds a BA Moderatorship in Geography and an MSc in Environmental Science. He is a Chartered Member of the Institution of Waste Management, a Chartered Environmentalist and an Associate of the Institute of Environmental Management and Assessment. He has over 35 years' experience in the field of environmental consultancy services including land use and landscape and visual impact assessment of large scale industrial waste management developments.

11.2 Relevant Legislation & Guidelines

The general EIA guidelines and legislation are listed in Section 1.5 and the specific guidelines relevant to the Landscape and Visual Impact Assessment taken into account in the preparation of this Chapter are:

- Guidelines for Landscape and Visual Impact Assessment (Landscape Institute & IEMA., UK 2013);
- Landscape and Landscape Assessment, Consultation Draft of Guidelines for Planning Authorities' published by the Department of the Environment and Local Government (June 2002), and
- Landscape Institute Technical Guidance Note 06/19: Visual Representation of Development Proposals
- Landscape Character Assessment (South Dublin County Development Plan 2022-2028).

11.3 Methodology

The objective of the assessment was to determine the magnitude and significance of the proposed development to the landscape character and visual setting. Significance depends on the sensitivity of the affected landscape and visual receptor and the magnitude of change judged to have resulted from the proposed development. In considering the magnitude and significance, the following were considered:

- The sensitivity of views taking into account both the public accessibility of the land where views are possible and the likely sensitivity of that view given the distance, travelling speed (if relevant), intervening vegetation and land usage;

- The quality and value of the existing landscape;
- The degree to which the development will be visible within the surrounding area, and
- Any other changes in the existing landscape e.g. new road junctions.

While the significance or scale of impact may range from 'Imperceptible' to 'Profound' in relation to distance and proximity, the nature of the change and the sensitivities of the viewers must be considered. An individual's sensitivity can cause emotive responses that often have little or no regard to the appropriateness and/or design of the proposal and, as such, it must be borne in mind that the impact of a proposed development must be assessed based on its context.

The assessment of quality must consider the nature of the proposed change, its context, appropriateness, quality of design and the sensitivities of the viewers. The quality of impact can be determined as 'positive' or 'negative' depending on whether the change is considered to improve or reduce the quality of the landscape character or visual environment. It may also be assessed as 'neutral' if the landscape is unaffected.

11.3.1 *Photomontages*

Photomontages of the proposed development showing the 'As Existing View' and 'As Proposed View' were prepared for selected viewpoints.The photomontages and analysis of views were prepared by Redline Studios, whose report is submitted with the application under separate cover. The four locations were visited, surveyed and photographed on 22nd October 2023 and this and the subsequent photomontages were undertaken in accordance with the "Landscape Institute Technical Guidance Note 06/19: Visual Representation of Development Proposals". These include guidance on photographic technology, including camera selection, choice of lens and printing.

11.3.3 Green Infrastructure Plan

ORS prepared a Green Infrastructure Plan that references or identifies all existing natural features (hedgerows, significant trees, waterbodies) and the proposed green infrastructure network within the development. The Plan includes details of all landscape areas, ecological corridors, drainage measures, walls / boundary specifications, locations of bird, bat and invertebrate boxes, any permeable paving, tree planting, biodiversity enhancement and hedgerow management proposals. Given the commercial nature and intended land-use, public access and connectivity were not applicable. A copy of the Plan is in Appendix 11.2.

11.4 **Proposed Development**

A detailed description of the proposed development is in Chapter 3. Those aspects that are relevant to the landscape and visual impact assessment are the topography; form, height and massing of the buildings; the construction materials texture and colour, the provision of a 4m high acoustic barrier, the removal of existing and the proposed landscape measures.

11.4.1 *Topography*

The site slopes gradually from southeast to northwest from approximately 64.95m OD in the south-east to 63.45m OD in the north-west.

11.4.2 *Building Form & Materials*

The building elevations and sections are shown on Drawing No. 221244-ORS-Z0-00-DR-AR-206. The building will be a steel portal frame structure, with external preformed and profile sheeting on the walls and low pitch roof cladding. It will be 11.02m to the eves, with an upper ridge level of 13.30m above ground level. The roof will be surrounded by a parapet designed to effectively mitigate glint and glare from roof mounted solar panels.

11.4.3 *Landscape Plan*

The existing trees are shown on the Existing Tree Plan. The Plan is based on a visual inspection of the trees on site from a landscape architects perspective, highlighting attributes, possible retention value, constraints and issues. It is intended as an overview rather than detailing precise arboricultural treatment or comments on tree safety

There are five discrete zones

Zone 1. South-Eastern Boundary

This section of the site contains a line of Sycamores of variable quality. Generally they are mature, with trunk diameters ranging between 200 and 500mm, and heights of 6m to 12m+. Generally the crown are heavily suppressed by the adjacent line of Leyland Cypress overgrown screen hedging and Poplars which run immediately adjacent outside the site boundary line, both of which are very vigorous types.

Some of the Sycamores have been damaged at the base most likely be machinery. However Sycamores are quite robust and seem to be thriving to varying degrees with occasional individuals under-performing at intervals, but nonetheless quite advanced and providing a contribution to perimeter screening.

Landscape Plan

Proposed Works at Starrus Eco Holdings Ltd. Ballymount rd, Dublin 24

Landscape design rationale :

The attached recommendations relate to screening and visual softening of the proposed recycling facility upgrade. The principal proposals include screening proposals / enhancement measures to improve the appearance of the facility. The location is quite industrial, nonetheless less the objective is to visually soften the development retaining existing trees where possible along the eastern and western boundaries, together with supplementary planting to integrate the facility as much as possible and in particular to provide substantial buffering between the facility and the adjacent road, and to frame and visually soften the proposed extensive building footprint structure and associated hardstanding areas, boundary security fences, walls and acoustic fencing to the east.

Overview of Existing Perimeter Vegetation

The existing site vegetation was reviewed with the intention to ascertain the type and quality of vegetation and tree stock on site and to review the general tree-scape within the proposed development site.

The proposed development of the site will entail the retention of the maximum number of trees around the perimeter. In the absence of an arborists tree survey being available, this general tree overview is submitted to show context in relation to the development proposals and to inform the landscape proposals for the perimeter planting. This is not intended as an arborists tree survey caried out to BS5837. A detailed Arborists review of the trees is recommended both pre and post construction and any specific recommendations on tree removal, protection or remedial works should be undertaken accordingly.

As a general overview of the trees on site from a landscape architects perspective, highlighting attributes, possible retention value, constraints and issues, this review is based on a visual inspection. It is intended as an overview rather than detailing precise arboricultural treatment or comments on tree safety.

The site vegetation was reviewed in terms of its general priority and suitability within the new site development proposed. The vegetation can be described as follows :

Zone 1.
South-eastern boundary

Comments :
This section of the site contains a line of Acer spp of variable quality. Generally they are mature, with trunk diameters ranging between 200 and 500mm, and heights of 6m to 12m+. Generally the crown are heavily suppressed by the adjacent line of Leyland Cypress overgrown screen hedging and Poplars which run immediately adjacent outside the site boundary line, both of which are very vigorous types. Some of the Acers have been damaged at the base most likely be machinery. However Acers are quite robust and seem to be thriving to varying degrees with occasional individuals under-performing at intervals, but nonetheless quite advanced and providing a contribution to perimeter screening.

Tree No 1	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	
Tree No 2	Acer pseudoplatanus	stem dia 400mm approx Ht 8m+	One sided
Tree No 3	Acer pseudoplatanus	stem dia 400mm approx Ht 8m+	One sided
Tree No 4	Acer pseudoplatanus	stem dia 400mm approx Ht 8m+	Dying. Remove
Tree No 5	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Leaning,Base damaged
Tree No 6	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Supressed southern side
Tree No 7	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Suppressed southern side
Tree No 8	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Suppressed southern side
Tree No 9	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Suppressed southern side
Tree No 10	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Suppressed southern side
Tree No 11	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Good. Slightingly suppressed
Tree No 12	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Larger. Good form.
Tree No 13	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Stem damaged base

Proposal :
It is recommended that the overhanding branches of the adjacent Poplars and Leylands which overhang the boundary be pruned back (in agreement with adjacent land owner). This will allow more light to the canopy of the existing boundary trees. Lightly prune the existing Acers to remove deadwood and any crossing branches or lower level limbs near ground. All should be reviewed by an arborist and any remedial recommendations implemented Tree no 1 will be difficult to retain and thrive due to the new access arrangement and will need to be removed, as will Tree no 4 due to its very poor condition. Others may need some crown reduction or other remedial works to arborists recommendations.

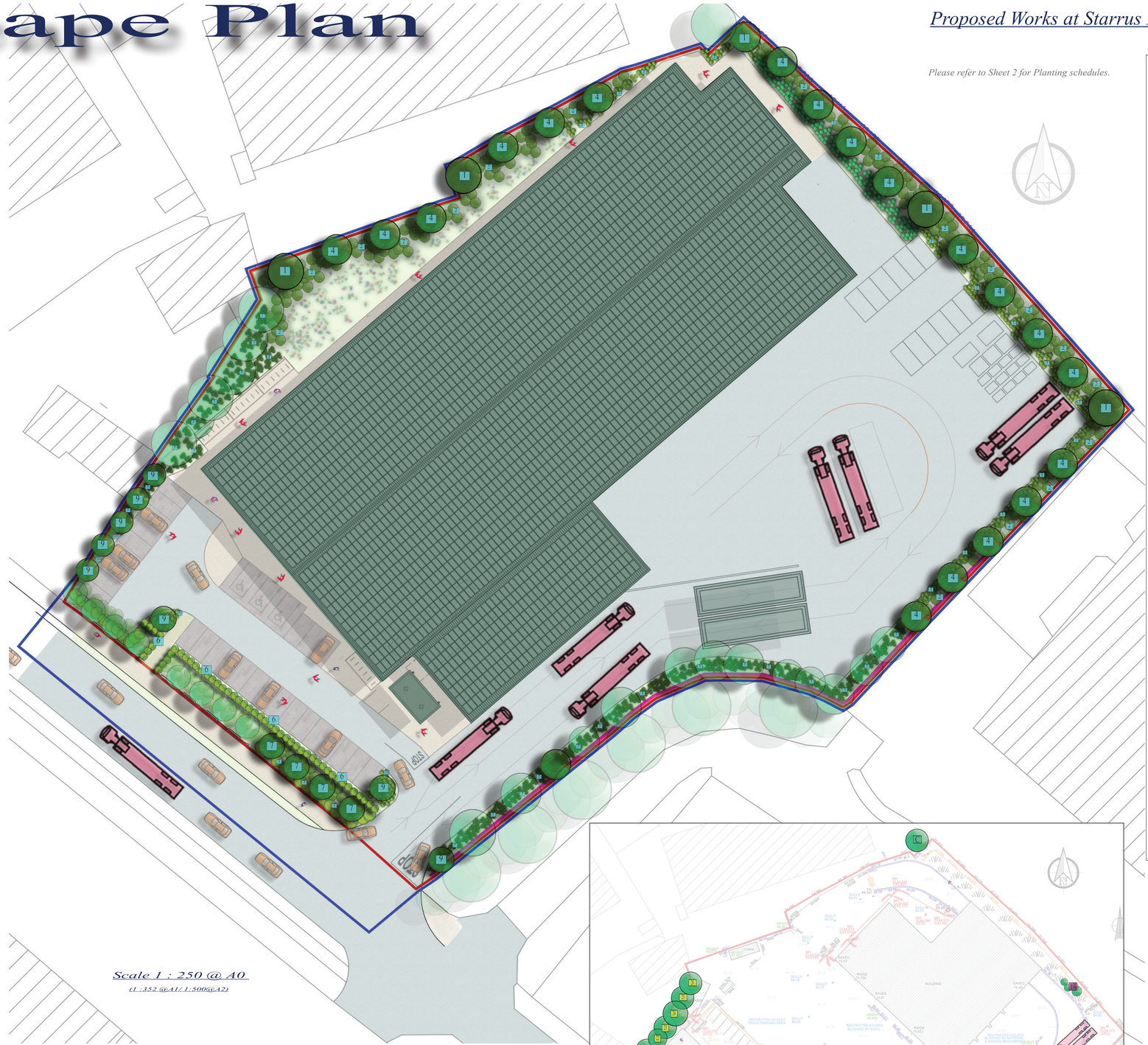
Additional planting :
See proposals for additional boundary planting opposite.

Zone 2
Northern boundary

Comments :
This boundary in general is devoid of trees, except for a small clump of juvenile Sycamore scrub which will be removed to facilitate new levels.

Tree No 14	Acer pseudoplatanus	Misc self seeded scrub	Small cluster. Minor importance

Please refer to Sheet 2 for Planting schedules.



Overview of Existing Perimeter Vegetation (continued)

Zone 3
Southern (Front Boundary - eastern side of existing entrance)

Comments :
This section contains two Acer spp trees, together with under-planting of common laurel (Prunus laurocerasus). All will be removed to facilitate new entrance.

Tree No 15	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+
Tree No 15a	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+
Planting No 15b	Prunus laurocerasus	Ht 4m+

Zone 3
Existing Entrance area

Comments :
This section contains a line of mature conifers aligned to the eastern side of the entrance. It consists of 3 no Leyland Cypress (x Cupressocyparis leylandii), together with a single Acer pseudoplatanus which is heavily suppressed by the adjacent conifers. All will be removed to facilitate the new entrance area (arborist to confirm all tree types and condition).

Zone 4.
Site frontage (southern side facing public road)

Comments :
This section contains a line of mature Acer pseudoplatanus trees set at approx 4-5 metre intervals behind the external boundary line to the west of the existing entrance area. To the eastern end a number of trees have been heavily pruned, presumably to prevent encroachment into the adjacent public footpath.

Under planting consist of a dense laurel band, which appears more full and unmanaged adjacent to the footpath at the western end.

Proposal :
It is recommended that all of the Acers be retained except for the removal of 1no. tree as shown to facilitate the new footpath entry point. The retained trees will maintain the existing level buffering effect. It is recommended the under planting of Laurel be retained also. . Lightly prune the existing Acers to remove deadwood and maintain good form or as directed by arborist. This will allow more light to the canopy of the existing boundary trees.

Zone 5.
Western Boundary

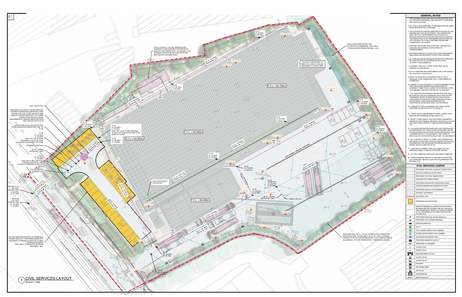
Comments :
This section contains two large conifers early mature (Leylands planted quite close to the boundary line. A smaler sycamore tree occupies a position in between and is heavily suppressed by the adjoining conifers Around the base of the conifers extensive groundworks has taken place previously, as is evident by the adjoining manholes and depression close to the tree trunk. It is envisaged that this would have a significant effect on the root zone., Coupled with the new car parking line which is with the Root protection area, the safest option is to remove these trees. Long therm they will prove difficult to martian and the root zone may be impacted by the proposed works making the trees unviable for the long term.

Running northwards along the western boundary line there are a nmumber of Acer pseudoplatanus trees which are the prime trees on site.Tree no 21 occuppoes a prime position near the corner of the existing building and appears on good condition. A line of Acers of similar size and conditon extends to tree no 26. These appear in good conditon andshould be retained. Any remedial works hould be taken in accordance with arborists guidance following a trorough review.

Proposal :
It is recommended that all of the Acers along the western boundary be retained. Care needs to be taken with the proposed new building line in relation to the root zones,and in particular in relation to the adjacent proposed bicycle parking area. This area should be surfaced in permeable paving materials, and all groundworks in the rootzone vicinity should be undertaken under the guidance of an arborist.

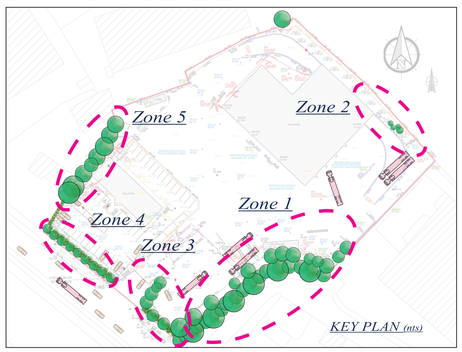
Denotes Existing trees, hedegrows and shrub planting to be retained

T1 — *Denotes Planting Proposals. Please refer to sheet no.2*



Drainage / Suds Overlay — Scale 1 : 1000 @ A0

Existing Trees — Scale 1 : 500 @ A0



Please also refer to Engineering Site Plans and detail drawings

Project :	Landscpe Proposals -Starrus Eco HoldingsLtd
Drawing No.	23/ORS/SEHL/001
Date :	November 27th 2023
Client :	Starrus Eco Holdings Ltd.
Notes :	

Sheet 1 - Overall Plan.

Hayes Ryan Landscape Architecture
Landscape Architects, Horticulture & Environmental Consultants
www.hayesryan.com
Kilmead, Athy, Co. Kildare.
info@hayesryan.com
Tel 01- 6875095

It is recommended that the, where accessible, the overhanding branches of the adjacent Poplars and Leylands which overhang the boundary be pruned back (in agreement with adjacent land owner). This will allow more light to the canopy of the existing boundary trees. Lightly prune the existing Sycamores to remove deadwood and any crossing branches or lower level limbs near ground.

All should be reviewed by an arborist and any remedial recommendations implemented. Tree No 1 will be difficult to retain and thrive due to the new access arrangement and will need to be removed, as will Tree No 4 due to its very poor condition. Others may need some crown reduction or other remedial works to arborists recommendations.

Zone 2 Northern Boundary

This boundary in general is devoid of trees, except for a small clump of juvenile Sycamore scrub which will be removed to facilitate new levels.

Zone 3 Existing Entrance

This section contains a line of mature conifers aligned to the eastern side of the entrance. It consists of 3 no Leyland Cypress, together with a single Sycamore which is heavily suppressed by the adjacent conifers. All will be removed to facilitate the new entrance area

Zone 4. Site Frontage:

This section contains a line of mature Sycamore trees set at approximately 4-5 metre intervals behind the external boundary line to the west of the existing entrance area. To the eastern end a number of trees have been heavily pruned, presumably to prevent encroachment into the adjacent public footpath. Under planting consist of a dense laurel band, which appears more full and unmanaged adjacent to the footpath at the western end.

It is recommended that all of the Sycamores be retained except for the removal of one facilitate the new footpath entry point. The retained trees will maintain the existing level buffering effect. It is recommended the under planting of Laurel be retained also.

Zone 5. Western Boundary

This section contains two large conifers early mature Leylands planted quite close to the boundary line. A smaller Sycamore tree occupies a position in between and is heavily suppressed by the adjoining conifers. Around the base of the conifers extensive groundworks has taken place previously, as is evident by the adjoining manholes and depression close to the tree trunk. It is envisaged that this would have a significant effect on the root zone.

Coupled with the new car parking line which is with the root protection area, the safest option is to remove these trees. In the long term they will prove difficult to maintain and the root zone may be impacted by the proposed works making the trees unviable for the long term.

Running northwards along the western boundary line there are a number of Sycamores which are the prime trees on site. These appear in good condition and should be retained. It is recommended that all of the Sycamores along the western boundary be retained. Care needs to be taken with the proposed new building line in relation to the root zones, and in particular in relation to the adjacent proposed bicycle parking area. This area should, if possible, be surfaced in permeable paving materials, and all groundworks in the root zone vicinity should be undertaken under the guidance of an arborist.

The proposed landscape measures are shown on the Planting Proposals Plan. The treeline/hedgerow along the south-eastern boundary will be extended to eastern boundary and along the north-eastern boundary to tie into the existing/treeline along the western boundary. Supplementary planting will be carried out at selected areas in the existing treelines/hedgerows that will be retained. Ornamental planting islands will be formed in the car park and along the northern boundary, while the swale will be planted with a Plant with an informal low carpeting and pollinator mix.

11.5 Receiving Environment

11.6 Landscape Character

The landscapes of South Dublin County are a dynamic mix of living elements that respond to history, culture, natural cycles, weather events, water, climatic and economic factors including those that relate to agriculture, industry, energy, transport, settlement and tourism.

The South Dublin County Development Plan's Landscape Character Assessment (LCA) classifies South Dublin's landscapes based on the types and values, and sensitivities. The LCA defines 6 Landscape Character Areas representing areas of distinctive character that makes one landscape different from another, such as uplands or the coast.

The Landscape Character Areas are:

- Liffey Valley
- Newcastle Lowlands
- Athgoe and Saggart Hills
- Dodder and Glenasmole
- Urban

The LCA also identifies several Landscape Character Types (LCT) within the County:

- River Valley
- Canal
- Agricultural Lowlands
- Low Foothills
- Foothills
- Mountains
- Green Space
- Transport Corridor
- Urban
- Historic Urban
- Urban Fringe

There may be several LCTs within each Landscape Character Area. The capacity of each LCT to absorb new development will largely depend on the sensitivity of the landscape. The sensitivity is classified as Low, Moderate or High.

The proposed development site is in the Urban/Historic Urban Area, which is characterised by a mix of residential and industrial areas, with few no protected views or prospects. The Urban Landscape Character Area is not categorised for sensitivity. The LCT is Historic Urban/Urban Fringe.

Landscape Plan

Proposed Works at Starrus Eco Holdings Ltd. Ballymount rd, Dublin 24

Tree Stock
Trees to comply with BS 3936-1 Nursery stock, and should have an upright, straight central leader and a well balanced branching head of a form and habit natural to the species. Rootballed trees shall be supplied with roots balled and securely wrapped to ensure that the soil and roots remain moist and intact until planting. Trees shall have been carefully lifted and conserving a suitable proportion of fibrous roots to aid transplanting.

Tree Planting
To BS 8545 (2014 -from nursery to independence). Excavate planting pit to ensure a minimum depth of 600mm topsoil. Fork over the base of the pit to achieve an even tilth 225mm deep. Supply slow release fertiliser 16-18 month Osmocote at the rate of 30gms/pit placing plant in position and

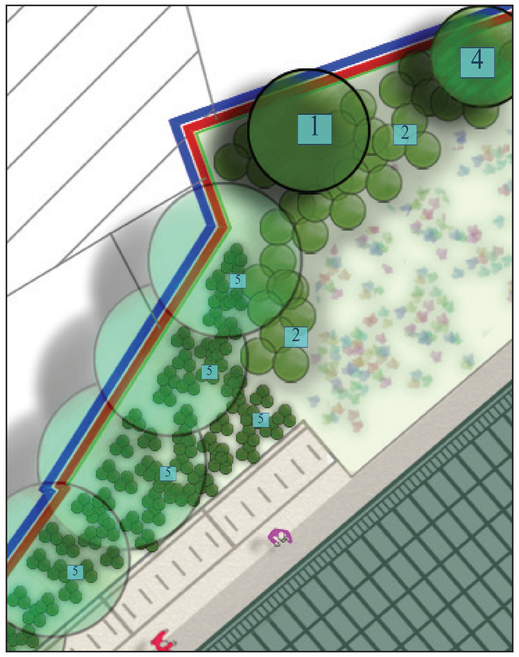
Stakes
Stakes shall be of peeled larch, Pine or Douglas Fir, preserved to manufacturer's recommendation. Stakes shall be turned and pointed one end. For tree size 6-8 up to 10-12cm use single stake. For tree sizes 12-20cm girth sizes use twos stakes with cross member. Use 2 stakes per tree set max. 500mm from tree. Stakes shall be min 1500mm * 100mm dia. Height above ground level of 600mm.The stake is to be driven with a drive all, wooden maul, or cast iron headed mallet, not with a sledge hammer. Stakes shall be buried approx 500mm into ground.

Tree Ties
Tree ties shall be of rubber, pvc or other suitable composition and durable enough to hold tree securely for three years. Ties will be min. 25mm wide, fitted with a buckle for adjustment. Ties to be nailed to the stake with one galvanised nail im-

Weed Control.
All planting beds to be maintained free of weeds through regular spot treatment for the duration prior to handover. Note particular care must be exercised to avoid spray damage or drifts onto adjoining plants.

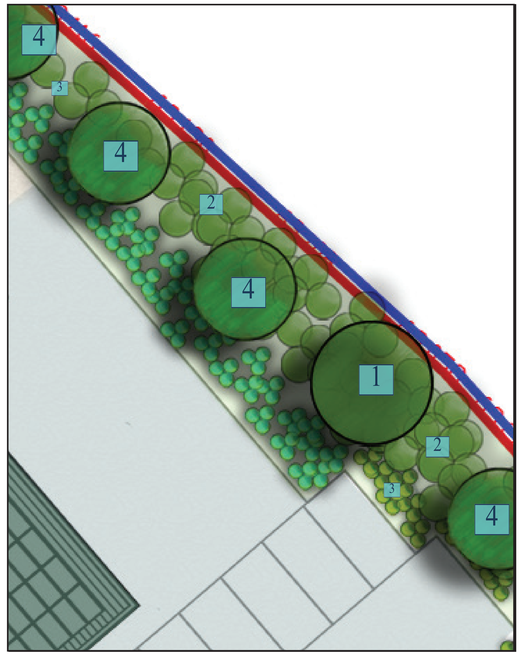
It is contractors responsibility to monitor ground conditions and weed germination and to put in place a regular treatment programme to ensure that weeds are controlled through the planting at all times.

Irrigation
It is the contractors responsibility to ensure that all planting is adequately watered during the growing season, particularly during periods of drought or to agree with the main contractor prior to pricing the works if they or client are responsible for ongoing irrigation.



Perimeter Extract Area A

Scale 1:100 @ A0 / 1:141 @A1 / 1:200 @A2

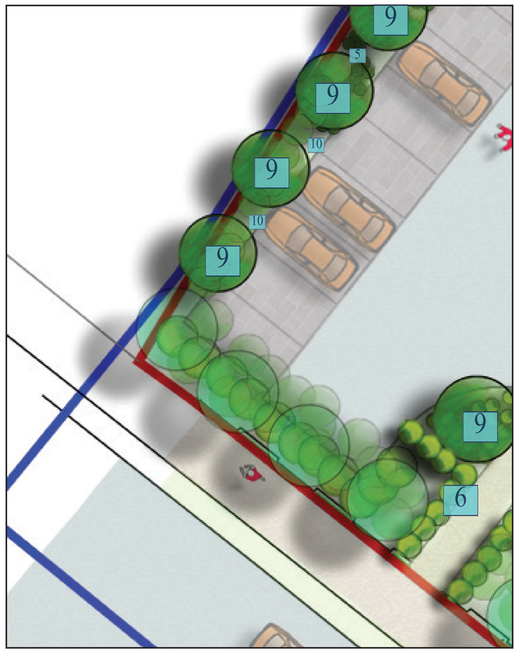


Perimeter Extract Area B

Scale 1:100 @ A0 / 1:141 @A1 / 1:200 @A2

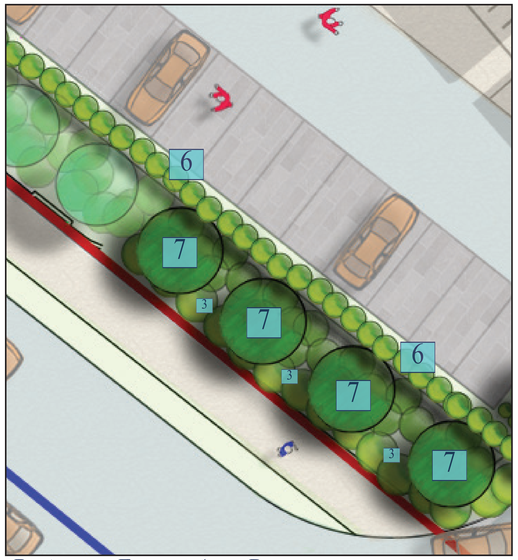
Perimeter Extract Area C

Scale 1:100 @ A0 / 1:141 @A1 / 1:200 @A2



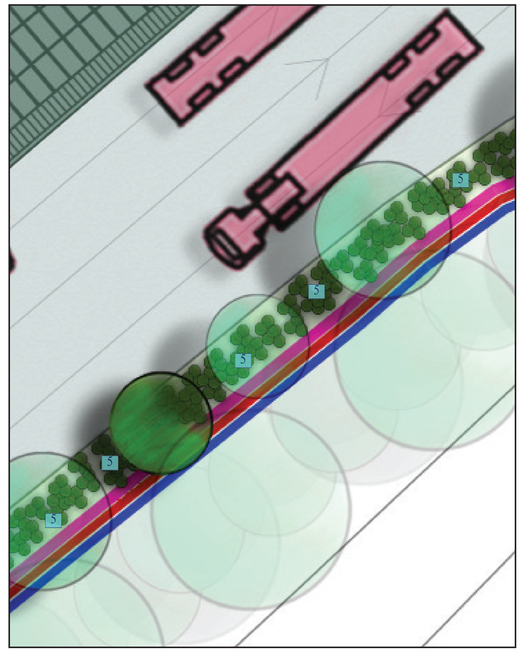
Perimeter Extract Area D

Scale 1:100 @ A0 / 1:141 @A1 / 1:200 @A2



Perimeter Extract Area D

Scale 1:100 @ A0 / 1:141 @A1 / 1:200 @A2



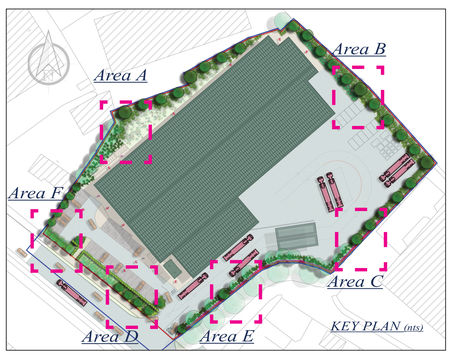
Perimeter Extract Area E

Scale 1:100 @ A0 / 1:141 @A1 / 1:200 @A2

— *Denotes Existing trees, hedegrows and shrub planting to be retained*

— *Denotes species rich grassland area, as per spec opposite*

11 — *Denotes Planting Type Please refer to Planting Schedule*



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Client :	Starrus Eco HGoldings Ltd.
Notes :	

Planting Schedule

Plese refer to items as numbered on attached plan.

Key	Plant name	Size	% Mix
	Primary Structure trees		
	Primary structure trees for long term focal pointas at key corners of substance as larger specimens at intervals where space permits through the perimeter areas.		
1	Quercus robur Fastigiata	RB 16-18	As shown
	Screening buffer Mix - Secondary trees		
	A selected mix of forms and growth habits containing rapid growing trees and trees selected for their generally upright form and canopy cover. Mid size trees for soft visual buffering and veiling, managable growth rate and habit.		
	The mixed whip planting to form a dense buffer over time and supplement primary trees.Consists of a range of native varieties together with other appropriate varieties with contrasting forms, textures and growth rates.		
2	Plant at 1.8 centres throughout the areas shown		
	Alnus glutinosa	BR 90-120cm ht	30%
	Pinus sylvestris	BR 30-50cm ht	15%
	Betula pubescens	BR 90-120cm ht	30%
	Prunus avium	BR 90-120cm ht	5%
	In addition to the above, plant the following as advanced feathered whips :		
	Alnus glutinosa	BR 150-180cm ht	10%
	Betula pubescens	BR 150-180cm ht	10%
	Understory Fringe		
	Located as fringe trees / understory towards the outer canopy edge to front the buffer adjoining the yard side.		
3	Plant at 1 centres throughout the areas shown		
	Corylus avellana	BR 60-90	20%
	Ilex aquifolium	5L 50-60	30%
	Rosa canina	BR 40-60	10%
	Viburnum opulus	BR 60-90	20%
	Euonymus europaeus	BR 60-90	20%
	Short Term Rapid screening trees		
	Rapid growing screening plants. Planted at larger initial sizes. All to be feathered plants (furnished / branched to base). The intention is that these trees will be planted for the development of an initial rapid screen.Maybe thinned and removed from the scheme on a phased basis over 10-15 years as the principal longterm screening develops and matures.		
4	Plant into the screen mix at locations as shown		
	Alnus cordata	BR 8-10	
	Understory Shade Planting		
	A shade tolerant mix for paktntign under the existign tree canopy areas		
5	Plant the following at 600mm centes, with min 20 no. plants per plant grouping. Informal drifts.		
	Ilex aquifolium	5L 50-60	
	Prunus OttoLuyken	2L 30-40	
	Lonicera pileata	2L 30-40	
	Plant the following as a groundcover carpet towards the outer harstanding side of the planting as a lower level edge to the ranging from 1.5-2m wide. Plant at 7/m2		
	Hedera helix hibernica	p9	
	New hedgerow at Car Park		
	Plant a biodiverse native hedge to front the existing boundary and Laurel understory. A mix of native hedging plants for		
6	The above areas to be planted with mixed native hedgerow consisting of the following plants planted at 300mm centres		
	Crataegus monogyna	BR 60-90	70%
	Rosa canina	BR40-60	5%
	Ligustrum vulgare	BR 60-90	15%
	Viburnum opulus	BR 60-90	5%
	Euonymus europaeus	BR 60-90	5%
	Sceening band at front (south-eastern boundary)		
7	Line of screening trees to link existing tree line to new entrance area :		
	Acer platinoides Emerald Queen	BR 16-18	As shown
	Understory infill as per understory fringe planting as above.		

Swale Area

Plant a biodiverse low to mid size mix for the swale depression.

Plant with the following low carpeting and pollinator mix, planted in informal large drifts throughout the swale area. Plant at 7/m2.

Hedera hibernica	p9	60%
Crocosmia Babylon	p9	25%

Plant the following in random informal grounds thrugh the groundcover planting Min 15 pants per group

Luzula nivea	2L	7%
Libertia grandiflora	2L	8%

Ornamental planting Islands at Car Park and Northern boundary

Trees in the island plantingarae as shown as a line along the wsstern boundary adjoining car park where existign conifers are to be removed.

9	Malus tsonozskii	BR 14-16	As shown

Selected ornamental groundcover planting for planting with emphsis on plants selcted form the All Ireland Pollinator Plan recommendations

10	Plant in informal groups at the spacings indicated, selected from the following varieties, with minimum 6 plants per group.		
	Mahonia aquifolium		
	Geranium Rozanne		
	Euphorbia amygdaloides		
	Sarcococca humilis		
	Lamium maculatum		
	Libertia grandiflora		
	Heleborus orientalis		
	Verbena bonariensis Lollipop		
	Stipa Polytails		
	Crocosmia Lucifer		
	Oberis sempervirens		
	Lavendula hidcote		
	Skimmia japonica		
	Rosemarinus officinalis prostratus		
	Geranium Wargrave Pink		
	Bergenia cordifolia	BR 14-16	As shown
	Agapanthus albus		
	Lavendula angustifolia	BR 14-16	As shown
	Anemone x hybrida		

Species rich Grassland /Wildflower Mix:

Supplied by Design by Nature, Kilkenny, or similar approved to be seeded with as per specialist suppliers instruction. Seed Mix may be altered by wildflower specialist on final examination of site and soil conditions post construction.

Irish Wildflower Conservation Grade Seed Mixture:
Range: Wild Flower Mixtures (Code WF)
Product Name: Biodiversity Wildflower Meadow Mixture (Tolerates light-shade)
Product Code: WF02

Description:

WF02 is a medium to tall mixture for any normal dry to moist soil and some species will grow in semi-shaded places especially those enriched with humus or rotted leaves, hence the addition of bluebell and other wood species.

Mixture Specifications:
pH range: Suits mid range soils neutral Ph.
Aspect: Sunny to slightly shaded such as a meadow running up to the shade of a tree
Life Cycle: Contains Cornfield Annuals, Perennials and Biennials .
Height Range: 40cm - 180cm
Flowering Period: May to September.
Fertility Range: Will grow on any soil, the less fertile the soil, the less cutting will be required.
Wintergreen: Moderate

Species List:
Annual Mayweed, Birdsfoot Trefoil, Black Meddick, Bladder Campion, Bluebell, Burdock, Cat's Ear, Common Sorrel, Corn Marigold, Corn Poppy, Corn Spurry, Corncockle, Cornflower, Cowslip, Devil's-bit Scabious, Eyebright, Field Scabious, Flag Iris, Fleabane, Foxglove, Garlic Hedge Mustard, Hemp Agrimony, Hoary Plantain, Kidney Vetch, Ladies Ann Lace, Lady's Bedstraw, Common Centaury, Lesser Knapweed, Musk Mallow, Marjoram, Meadow Buttercup, Meadowsweet, Mullein, Ox-Eye Daisy, Pineapple Mayweed, Purple Loosestrife, Ragged Robin, Red Bartsia, Red Campion, Red Clover, Ribwort Plantain, Rough Hawksbit, Selfheal, Shepherd's Purse, Smooth Hawksbit, St. Johnswort, Teasel, Vetch Common, Weld, White Campion, Wild Angelica, Wild Carrot, Wild Valerian, Woundwort, Yarrow, Yellow Agrimony, Yellow Rattle

Seed Sowing Rates:
Normal sowing rates:
Pure wildflowers - no grass, 1.5 grams per metre.
Added grass seed: 1.5 grams per metre (depending on grass species).

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Sheet 2 - Planting Proposals

Landscape Plan

Proposed Works at Starrus Eco Holdings Ltd. Ballymount rd, Dublin 24

Landscape design rationale :

The attached recommendations relate to screening and visual softening of the proposed recycling facility upgrade. The principal proposals include screening proposals / enhancement measures to improve the appearance of the facility. The location is quite industrial, nonetheless less the objective is to visually soften the development retaining existing trees where possible along the eastern and western boundaries, together with supplementary planting to integrate the facility as much as possible and in particular to provide substantial buffering between the facility and the adjacent road, and to frame and visually soften the proposed extensive building footprint structure and associated hardstanding areas, boundary security fences, walls and acoustic fencing to the east.

Overview of Existing Perimeter Vegetation

The existing site vegetation was reviewed with the intention to ascertain the type and quality of vegetation and tree stock on site and to review the general tree-scape within the proposed development site.

The proposed development of the site will entail the retention of the maximum number of trees around the perimeter. In the absence of an arborists tree survey being available, this general tree overview is submitted to show context in relation to the development proposals and to inform the landscape proposals for the perimeter planting. This is not intended as an arborists tree survey caried out to BS5837. A detailed Arborists review of the trees is recommended both pre and post construction and any specific recommendations on tree removal, protection or remedial works should be undertaken accordingly.

As a general overview of the trees on site from a landscape architects perspective, highlighting attributes, possible retention value, constraints and issues, this review is based on a visual inspection. It is intended as an overview rather than detailing precise arboricultural treatment or comments on tree safety.

The site vegetation was reviewed in terms of its general priority and suitability within the new site development proposed. The vegetation can be described as follows :

Zone 1.
South-eastern boundary

Comments :
This section of the site contains a line of Acer spp of variable quality. Generally they are mature, with trunk diameters ranging between 200 and 500mm, and heights of 6m to 12m+. Generally the crown are heavily suppressed by the adjacent line of Leyland Cypress overgrown screen hedging and Poplars which run immediately adjacent outside the site boundary line, both of which are very vigorous types. Some of the Acers have been damaged at the base most likely be machinery. However Acers are quite robust and seem to be thriving to varying degrees with occasional individuals under-performing at intervals, but nonetheless quite advanced and providing a contribution to perimeter screening.

Tree No 1	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	
Tree No 2	Acer pseudoplatanus	stem dia 400mm approx Ht 8m+	One sided
Tree No 3	Acer pseudoplatanus	stem dia 400mm approx Ht 8m+	One sided
Tree No 4	Acer pseudoplatanus	stem dia 400mm approx Ht 8m+	Dying. Remove
Tree No 5	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Leaning,Base damaged
Tree No 6	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Supressed southern side
Tree No 7	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Suppressed southern side
Tree No 8	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Suppressed southern side
Tree No 9	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Suppressed southern side
Tree No 10	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Suppressed southern side
Tree No 11	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Good. Slightingly suppressed
Tree No 12	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Larger. Good form.
Tree No 13	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+	Stem damaged base

Proposal :
It is recommended that the overhanding branches of the adjacent Poplars and Leylands which overhang the boundary be pruned back (in agreement with adjacent land owner). This will allow more light to the canopy of the existing boundary trees. Lightly prune the existing Acers to remove deadwood and any crossing branches or lower level limbs near ground. All should be reviewed by an arborist and any remedial recommendations implemented Tree no 1 will be difficult to retain and thrive due to the new access arrangement and will need to be removed, as will Tree no 4 due to its very poor condition. Others may need some crown reduction or other remedial works to arborists recommendations.

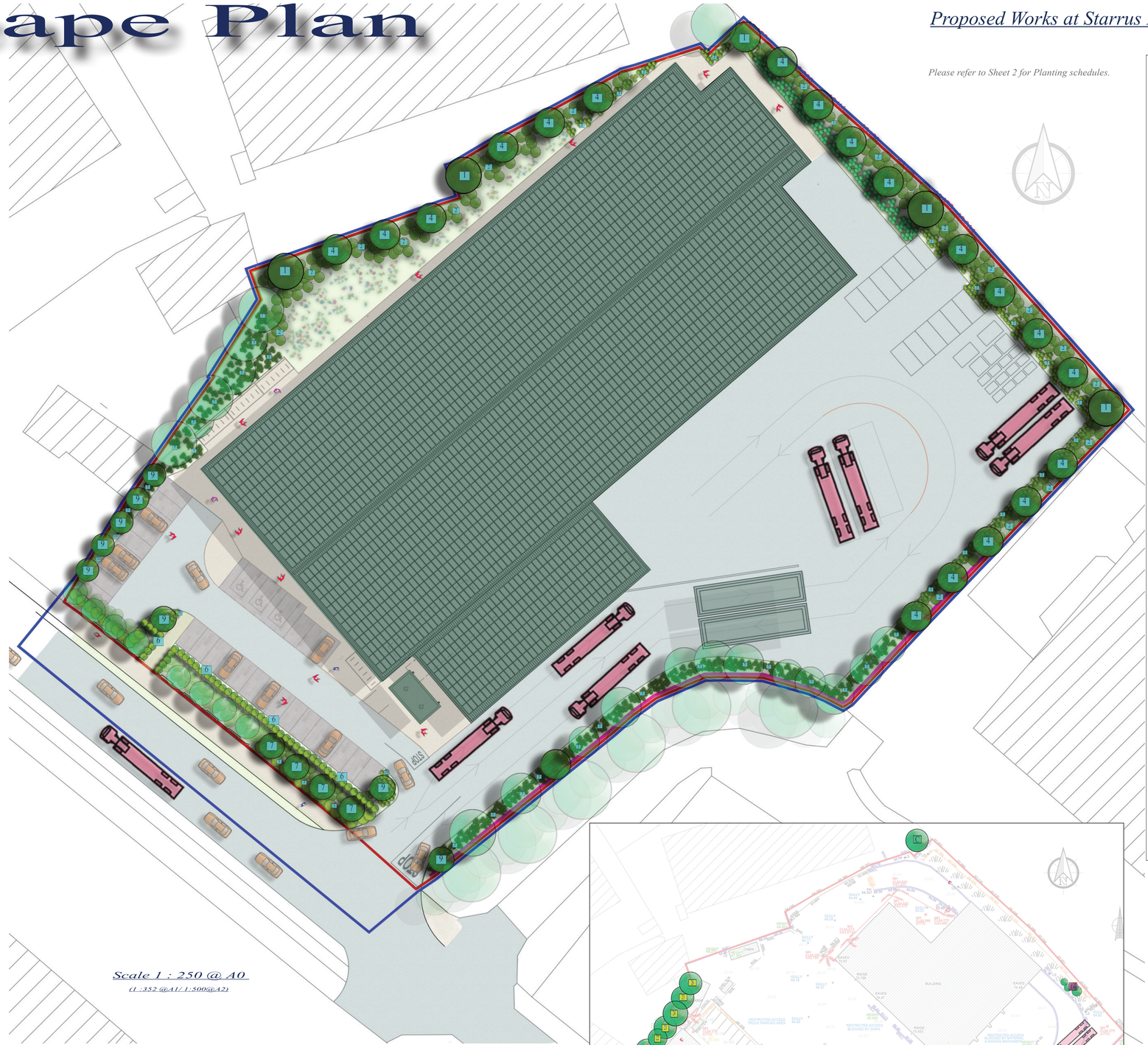
Additional planting :
See proposals for additional boundary planting opposite.

Zone 2
Northern boundary

Comments :
This boundary in general is devoid of trees, except for a small clump of juvenile Sycamore scrub which will be removed to facilitate new levels.

Tree No 14	Acer pseudoplatanus	Misc self seeded scrub	Small cluster. Minor importance

Please refer to Sheet 2 for Planting schedules.



Overview of Existing Perimeter Vegetation (continued)

Zone 3
Southern (Front Boundary - eastern side of existing entrance)

Comments :
This section contains two Acer spp trees, together with under-planting of common laurel (Prunus laurocerasus). All will be removed to facilitate new entrance.

Tree No 15	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+
Tree No 15a	Acer pseudoplatanus	stem dia 500mm approx Ht 8m+
Planting No 15b	Prunus laurocerasus	Ht 4m+

Zone 3
Existing Entrance area

Comments :
This section contains a line of mature conifers aligned to the eastern side of the entrance. It consists of 3 no Leyland Cypress (x Cupressocyparis leylandii), together with a single Acer pseudoplatanus which is heavily suppressed by the adjacent conifers. All will be removed to facilitate the new entrance area (arborist to confirm all tree types and condition).

Zone 4.
Site frontage (southern side facing public road)

Comments :
This section contains a line of mature Acer pseudoplatanus trees set at approx 4-5 metre intervals behind the external boundary line to the west of the existing entrance area. To the eastern end a number of trees have been heavily pruned, presumably to prevent encroachment into the adjacent public footpath.

Under planting consist of a dense laurel band, which appears more full and unmanaged adjacent to the footpath at the western end.

Proposal :
It is recommended that all of the Acers be retained except for the removal of 1no. tree as shown to facilitate the new footpath entry point. The retained trees will maintain the existing level buffering effect. It is recommended the under planting of Laurel be retained also. . Lightly prune the existing Acers to remove deadwood and maintain good form or as directed by arborist. This will allow more light to the canopy of the existing boundary trees.

Zone 5.
Western Boundary

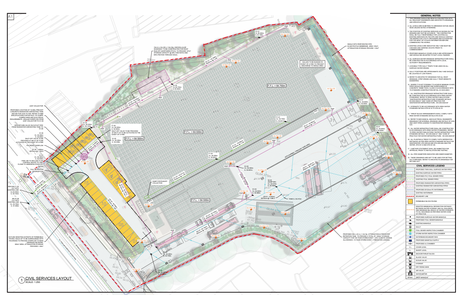
Comments :
This section contains two large conifers early mature (Leylands planted quite close to the boundary line. A smaler sycamore tree occupies a position in between and is heavily suppressed by the adjoining conifers Around the base of the conifers extensive groundworks has taken place previously, as is evident by the adjoining manholes and depression close to the tree trunk. It is envisaged that this would have a significant effect on the root zone., Coupled with the new car parking line which is with the Root protection area, the safest option is to remove these trees. Long therm they will prove difficult to martian and the root zone may be impacted by the proposed works making the trees unviable for the long term.

Running northwards along the western boundary line there are a nmumber of Acer pseudoplatanus trees which are the prime trees on site.Tree no 21 occuppoes a prime position near the corner of the existing building and appears on good condition. A line of Acers of similar size and conditon extends to tree no 26. These appear in good conditon andshould be retained. Any remedial works hould be taken in accordance with arborists guidance following a trorough review.

Proposal :
It is recommended that all of the Acers along the western boundary be retained. Care needs to be taken with the proposed new building line in relation to the root zones,and in particular in relation to the adjacent proposed bicycle parking area. This area should be surfaced in permeable paving materials, and all groundworks in the rootzone vicinity should be undertaken under the guidance of an arborist.

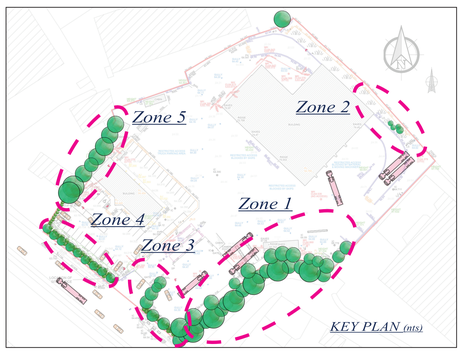
Denotes Existing trees, hedegrows and shrub planting to be retained

T1 — *Denotes Planting Proposals. Please refer to sheet no.2*



Drainage / Suds Overlay — Scale 1 : 1000 @ A0

Existing Trees — Scale 1 : 500 @ A0



Please also refer to Engineering Site Plans and detail drawings

Project :	Landscpe Proposals -Starrus Eco HoldingsLtd
Drawing No.	23/ORS/SEHL/001
Date :	November 27th 2023
Client :	Starrus Eco Holdings Ltd.
Notes :	

Sheet 1 - Overall Plan.

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11.6.1.1 Local Landscape

At a site specific level, the proposed development site is an area zoned for employment and enterprise, with industrial type developments to the west and south. The adjoining lands to the east and north east have been used for agriculture, but planning permission has been granted for warehousing, offices and a cafe. It is not in an area designated as Highly Sensitive, Special Amenity Area or of High Amenity Value and is not overlooked by any designated views or prospect areas.

11.6.2 *Visibility*

Given the local land use, topography and existing vegetation the public views of the site are limited to Ballymount Road Upper and from the undeveloped lands adjoining the north-eastern boundary.

11.7 **Impacts**

The proposed development will impact on the landscape character to varying degrees based on its perceived nature and scale. These effects are tempered and conditioned by sensitivities associated with the receptor. The duration of such impacts is however determined by the design life of the proposed development. In this case the development has a design life of up to 60 years and in this instance the impacts on landscape character are therefore deemed to be of long-term duration.

In assessing the landscape character impacts, there are three main inter-related aspects to be addressed in considering the development proposals, namely:

- The perceived character of the area – how it is affected by the proposal;
- Effects of the proposed development on social and cultural amenity, and
- The proposed views of the development, relative to the existing site and the associated impact on visual amenity.

11.7.1 *Trees, Woodland and Hedgerows*

The existing treeline/hedgerows will be retained to the maximum extent possible. To facilitate the construction eight (8 No) Sycamores along the line of new site entrance, three (3No) along the western boundary and three (3No) along the northern boundary will be removed.

11.7.2 *Landscape Character*

The development will not result in a change to the landscape character. The development will consist of the removal of two buildings replacing them with one industrial unit. The subject site is zoned for Enterprise and Employment and the proposed development is consistent with this zoning

11.7.3 *Views*

11.7.3.1 Construction Stage:

In the construction stage the following have the potential to cause temporary impacts:

- Construction of the new entrance;
- Temporary site works – hoarding, lighting, cranes, car parking, storage areas;
- Groundworks – cut and fill excavations;
- Installation of foundations and site services;
- Construction of buildings, and
- Construction traffic.

11.7.3.2 Operational Stage

The principal elements likely to give rise to landscape and visual impact in the long term are:

- Alterations to ground levels;
- Building massing and heights;
- New structures, road, lighting, boundaries and pathways, and
- Landscape works.

11.7.4 *Visibility into the Site*

For the visual impact assessment, viewpoints were selected to represent the likely visual impact from a variety of direction around the site. The viewpoints are shown on Figure 11.1.

Figure 11.1 View Points

Visual 1: View Point 1

Baseline View-Low Sensitivity:

From this location the development site is partially screened by off-site buildings and treelines

Proposed Changes and Visual Impact:

A section of the western and southern elevation of the building will be visible although partially screened by the existing vegetation. The remainder of the building will be effectively screened from view by the existing vegetation and buildings.

Visual 2: View Point 2

Baseline View: *Low to Medium Sensitivity*

The existing site entrance affords views of the office. The existing treeline and understory partially screens the eastern section of the site from view.

Proposed Changes and Visual Impact:

The southern and south-eastern elevation of the new building will be visible from the new site entrance.

Visual 3: View Point 3

Baseline View: Low Sensitivity

Proposed Changes and Visual Impact:

The proposed development will be entirely screened by the combination of the road frontage of the commercial premises and the existing planting.

Visual 4: View Point 4

Baseline View: Low Sensitivity

A combination of the topography, palisade fencing and building effectively screens the site from view.

Proposed Changes and Visual Impact:

The roof ridge of the building will be just visible, but the existing buildings will effectively screen the remainder of the building from view.

11.8 Likely Future Receiving Environment

If development does not proceed the land use at the site will not change, with no alteration to the landscape character and no additional visual intrusion.

11.9 Prevention & Mitigation Measures

11.9.1 *Design Stage*

The height of the stack on the odour control unit was determined by the air dispersion modelling. The colours of the external building materials were selected to minimise visual intrusion and integrate into the surrounding built environment. It was a design objective to retain to the greatest extent possible the existing hedgerows/ treelines around the development boundary, supplement them with native planting and to extend the hedgerows/treelines along the eastern and northern boundaries.

11.9.2 *Construction Stage*

Careful attention will be paid to avoiding any potentially adverse construction-related effects on the adjacent residences. In the set up stage buffer zones will be established between the working areas and the hedgerows/treelines to protect the root zones. In addition, any lighting required during the construction phase will be located sensitively to avoid unnecessary light spill into the surrounding premises.

11.9.3 *Operational Stage*

A landscape contractor will be engaged to maintain the boundary treatment.

11.10 Monitoring

11.10.1 *Construction Stage*

In the construction stage the following will be implemented:

- Set Up– clearly identify trees and hedgerows that are to be retained and protected – ensuring tree protection measures are then place. Clearly identify trees and vegetation that are to be removed.
- Excavation stage – ensure existing vegetation is adequately protected.
- Landscape Works - ensure that landscape proposals are being implemented correctly

11.10.2 *Operational Stage*

The landscaping measures will be regularly inspected to assess the quality of the boundary treatment

11.11 Cumulative Effects

The proposed development building size and massing is designed to integrate it into the surrounding landscape that is dominated by commercial and industrial developments. It will, in combination with the existing built environment and the permitted but not yet constructed office and logistic

development on the lands adjoining the north-eastern boundary, the have a negative, not significant, negative, local and long term cumulative impact on the landscape.

11.12 Residual Impacts

11.12.1 *Landscape*

The development will not alter the existing landscape character, will have a slight impact on the existing boundary hedgerows and will have no impact amenities and cultural heritage. The impact will be negative, not significant, local, likely and long term.

11.12.2 *Visibility*

A combination of the topography and existing vegetation effectively screens the proposed development from the majority of public view points. The new building will be visible all year round from view points on Ballymount Road Upper. In the context of the surrounding landscape, which is dominated by commercial and industrial type structures, the visual impact will be negative, not significant, local, likely and long term.

11.12.3 *Summary of Residual Impacts*

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Landscape Character	Negative	Not Significant	Local	Likely	Long Term
Visual Intrusion	Negative	Not Significant	Local	Likely	Long Term

12. CULTURAL HERITAGE

12.1 Introduction

This Chapter describes the archaeological, architectural and cultural heritage significance of the development site and its environs and assesses the impact of the proposed development including a 'baseline' scenario. It identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts.

Cultural Heritage has been defined by UNESCO as "the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations" (Tangible Cultural Heritage, UNESCO http://www.unesco.org/new/en/cairo/culture/tangible-cultural-heritage).

Cultural Heritage encompasses all humanly created features on the landscape, including portable artefacts, which might reflect the prehistoric, historic, architectural, engineering and/or social history of the area. Where appropriate, it also includes for non-physical aspects of heritage, such as history, linguistics, folklore, etc.

This Chapter was prepared by Mr Jim O'Callaghan of OCM Mr O'Callaghan holds a BA Moderatorship in Geography and an MSc in Environmental Science. He is a Chartered Member of the Institution of Waste Management, a Chartered Environmentalist and an Associate of the Institute of Environmental Management and Assessment. He has over 35 years' experience in the field of environmental consultancy services including land use assessment of large scale development projects.

12.2 Relevant Legislation & Guidance

The general EIA legislation and guidance documents are referenced in Sections 1.5 of this EIAR. In addition the Heritage Act (1995) identifies the various aspects of heritage, including archaeological monuments and objects, architectural heritage, fauna, flora, geology, heritage gardens and parks, heritage objects, inland waterways, landscapes, monuments, seascapes, wildlife habitats, and wrecks.

12.3 Methodology

The proposed development site is an operational waste management facility and previous construction stages involved extensive ground disturbance. Therefore archaeological and cultural heritage field surveys were not required and the assessment was based on a desk study of the following information sources:

- South Dublin County Development Plan,
- National Monuments Service - Sites and Monuments Record (SMR),
- National Inventory of Architectural Heritage (NIAH)
- Rocque's Map of County Dublin 1760

- Ordnance Survey of Ireland (OSI) First and Revised Editions of 6 and 25 Inch Maps
- Reports on previous archaeological investigations undertaken in the vicinity of the site, which provide a context for the local cultural heritage value.

The Study Area was within a 1km radius of the proposed development site.

12.4 Proposed Development

Chapter 3 provides a full description of the proposed development. Those aspects of the development of relevance to Cultural Heritage are:

- Site clearance including building demolition stripping and stockpiling of subsoils and removal from the site of surplus soils, and
- Construction of the buildings, paved yards and provision of underground services.

12.5 Receiving Environment

12.5.1 *Study Area*

South Dublin County is an amalgamation of the previously industrial villages of Lucan, Palmerstown, Templeogue and Rathfarnham, the once rural villages of Tallaght and Clondalkin and the villages of Newcastle, Rathcoole and Saggart. In this context, the County contains a vast and varied array of buildings, structures and sites of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

There are no recorded cultural heritage features inside the development site boundary and it is not adjacent to any Zone of Archaeological Potential. Within the Study Area, to the south-west is the 17th Century Ballymount Manor House (DU021-015001). The area surrounding the Manor House includes a Gatehouse (DU021-015002), a Stepped Barrow (DU021-015003), a Designed Landscape-Belvedere (18th Century Folly)(DU021-015004), an ancient roadway connecting Ballymount to Belgard Road (DU021-015005), a Ceremonial Enclosure (DU021-015006) and a Limekiln (DU021-015007).

To the south-east, in Kilnamanagh there is a cluster of archaeological features including a Castle Tower House (DU022-005001), Church (DU022-005002), Graveyard (DU022-005003), Holy Well (DU022-005004), Ecclesiastical Enclosure (DU022-005005), Bawn (DU022-005008) and Earthworks (DU022-005009).

To the north-east of the proposed development site is a Flat Cemetery (DU022-002, uncovered in 1892 during the quarrying of a sand and gravel ridge and comprised a burial with a bowl food vessel and a vase food vessel. In 1898 two cists with two pit burials and two other possible pit burials were discovered. One contained an urn, the other a food vessel/urn. Further north there is a Holy Well (DU022-001) and Linkardstown Burial Site (DU018-037).

12.5.2 *Previous Investigations*

In 2022, Courtney Deery Heritage Consultancy Ltd completed an Archaeological Assessment for a commercial development (Ref SD 22A/0099) on the 7ha field adjoining the north-eastern boundary of the proposed development site. The assessment included a site survey by an Archaeologist and the

inspection of 11 No Site Investigation Test Pits and no archaeological features, finds or deposits were observed.

12.5.3 *Cultural Heritage Value*

The proposed development site does not contain any previously recorded archaeological or built heritage features. As the site has been extensively developed it is highly likely that an unknown cultural heritage features within the site boundaries were removed/destroyed during construction works. The closest Recorded Monument Ballymount Manor House (DU021-015001), situated approximately 700m to the west/north west. The overall cultural heritage value is low.

12.6 **Impacts**

There are no known cultural heritage features within the development site boundary. Given the development history of the site any unknown features that may have been present have either been destroyed or removed. Therefore the proposed development will not have any direct or indirect impact on cultural heritage features.

12.7 **Likely Future Receiving Environment**

If the development does not proceed the site will remain in its current condition, with no changes to the potential impacts on the overall cultural heritage.

12.8 **Prevention and Mitigation Measures**

12.8.1 *Design Stage*

Based on the cultural heritage value of the proposed development site design mitigation measures are not required.

12.8.2 *Construction Stage*

There is no evidence of any cultural features inside the proposed development site and given the site history it is highly likely that any unknown features that may have been present in the subsoils have been destroyed, therefore there is no need for prevention and mitigation measures.

12.8.3 *Operational Stage*

As there will be no impacts on cultural heritage features in the operational stage mitigation measures are not required.

12.9 **Monitoring**

12.9.1 *Construction Stage*

Construction stage monitoring is not required.

12.9.2 *Operational Stage'*

Operational stage monitoring is not required.

12.10 Cumulative Impacts

The proposed development will have no cumulative effects on Cultural Heritage.

12.11 Residual Impacts

The only potential for impacts is on unknown archaeological features in the construction stage; however based on the development history any such features that may have been present were removed/destroyed in previous construction works and therefore the proposed development will have no significant residual impacts on cultural heritage

12.11.1 *Summary of Residual Impacts*

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Construction Stage					
Loss of Archaeological Features	Neutral	Imperceptible	Local	Unlikely to occur	Permanent

13. MATERIAL ASSETS: BUILT SERVICES & INFRASTRUCTURE

13.1 Introduction

This Chapter describes the material assets on and in the environs of the site. It identifies the potential impacts, describes the proposed prevention mitigation and monitoring measures and assesses the impacts, including residual impacts. It also addresses a 'baseline' scenario.

Material Assets as defined in the 'Advice Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022) are 'built services and infrastructure'. This includes roads and traffic, electricity, telecommunications, gas, water supply infrastructure, sewerage systems and waste management. Roads and traffic are addressed separately in Chapter 14. This Chapter was prepared by Dr Martina Gleeson and Mr Jim O'Callaghan of OCM and should be read in conjunction with Chapter 5 Climate and Chapter 14 Traffic and Transport.

13.2 Relevant Legislation & Guidance

In addition to the guidance documents referenced in Section 1.5 the following legislation and guidance were taken into consideration:

- The Waste Management Act 1996, as amended;
- Waste Management Plan for the Eastern Midlands Region (2015 to 2021)
- Waste Action Plan for a Circular Economy (Department of Environment, Climate & Communications 2021.
- Building Regulations Part G (S.I. No. 335/2008), Part H (S.I. No. 561/2010) and Part L (S.I. No 292/2019 –
- European Commission (2018) Revised Energy Performance of Buildings Directive (EPBD) (2018/844/EU)
- European Union (Energy Performance of Building) (No.2) Regulations 2019),
- Part L and European Union (Energy Performance of Buildings) (No. 2) Regulations 2019 Technical Guidance Document (Department of Housing, Planning and Local Government).
- European Union (Energy Performance of Buildings) Regulations 2021 (S.I. No. 393 of 2021).

13.3 Methodology

The assessment was based on and information derived from the current County Development Plan, Eastern Midlands Region Waste Management Plan, Uisce Eireann database and the ORS Engineering Report (Appendix 3.1). The Engineering Report should be consulted for the detailed information on the existing and proposed water supply, wastewater and surface water services.

13.4 Proposed Development

Chapter 3 describes the existing site and the proposed development. Those aspects that are relevant to the built services are water, electricity and energy supplies, surface water and foul water drainage, waste management and natural resource consumption.

13.5 Receiving Environment

13.5.1 *Built Services*

The site is connected to the mains electrical and telecoms supply and the Uisce Eireann storm water and foul sewer systems.

13.5.2 *Waste Management*

In 2020, the government published its 'Waste Action Plan for a Circular Economy' to take cognisance of the European Commission's (Commission) Action Plan on the Circular Economy. The purpose of Commission's Action Plan the is to transition the European Union (EU) to an economy where the value of products, materials and resources is maintained for as long as possible and the generation of waste minimised. This transition is essential to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy.

The Commission recognises that recycling is a pre-condition for a circular economy, where resources and materials can be recycled, returned back to the economy and used again, meaning that what was once considered a waste can become a valuable resource. To achieve this, materials at the end of their life cycle should be recovered through recycling and ideally reintroduced to the product lifecycle. These "secondary raw materials" can then be traded like primary raw materials.

The objective of the government's Waste Action Plan for a Circular Economy is to inform and direct waste planning and management in Ireland over the coming years. While the thrust of the Plan is to prevent waste arising through reuse its objectives include ensuring that measures support sustainable economic models (for example by supporting the use of recycled over virgin materials).

The Plan promotes the development – for environmental and economic reasons – of adequate and appropriate treatment capacity at indigenous facilities to ensure that the full circularity and resource potential of materials is captured in Ireland.

Efforts to decouple waste generation from economic growth have not yet been successful and the economic recovery that started in 2014, in conjunction with population growth, has resulted in a continuing increase in the quantities of waste arising, both nationally and in the Greater Dublin Area.

The Eastern Midlands Regional Waste Management Plan estimates that the increase in municipal wastes (combined household and commercial) between 2012 and 2021 will be in the region of 2-3% annually. Growth at the higher rates presents a challenge to the region to ensure adequate collection and treatment capacity is required. Furthermore, the need to treat more of these wastes in the country in support of Circular Economy initiatives means that treatment capacity needs to increase above the projected rates, making the provision of capacity even more challenging.

To ensure that national and regional recovery and recycling targets are met, to minimise the amount of waste disposed to landfill and to roll out circular economy initiatives there is a need to increase indigenous waste recycling and recovery capacity.

13.6 **Impacts**

13.6.1 *Water Supply*

In the operational stage water for potable use and for use in the dust control measures will be obtained from the mains supply. Rainwater will be harvested for use as 'grey water' in the staff well fare facilities and for dust suppression in the yards, with the latter supplemented by the mains supply. The rainwater harvesting will reduce the demand on the mains supply.

13.6.2 *Surface Drainage Systems*

The surface water drainage system will incorporate SuDs measures including rainwater harvesting and infiltration to ground, with the surplus water discharged to the Uisce Eireann storm water sewer at greenfield run-off rates. This will reduce the hydraulic loading on the Uisce Eireann's storm water network.

13.6.3 *Foul Water Drainage*

Sanitary wastewater and small amounts of liquid seeps from the waste processing will discharge to the Uisce Eireann foul sewer. The relocation of the SEHL sister company administrative support staff (50 No) has reduced the hydraulic and organic loading on the Uisce Eireann foul sewer.

13.6.4 *Resource Consumption*

13.6.4.1 Electricity

The facility will be connected to the main electricity network and a new electricity substation will be provided in the south of the site due to increased electricity demand linked to the additional materials processing. An external upgrade of the grid is not required. A significant element of the increased electricity consumption is linked to relocation of the waste activities from the SDCC Baling Station & Civic Amenity Area, which will be decommissioned.

In 2022 the Baling Station & Civic Amenity Area accepted 197,000 tonnes of which 30,000 tonnes was Civic Amenity waste. In 2022 the existing SEHL facility accepted 122,000 tonnes of waste, giving a combined total 282,000 tonnes of wastes accepted and processed. Therefore the net increase in consumption will be linked to the approximately additional 70,000 tonnes

Roof mounted solar panels (500kw) will supply electricity directly to the facility and will reduce the energy demand on the national network that would otherwise occur due to the increased processing capacity.

13.6.4.2 Water

The harvesting of rainwater for use in the toilets and the dust suppression measures will reduce the demand on the mains water supply. The rain water storage tanks will have a capacity of 10m^3.

13.6.4.3 Fossil Fuels

The proposed development will result in fossil fuel (diesel) consumption in the construction stage. It will also cause an increase in fossil fuel (diesel) consumption compared to the current operations due to the increased processing using mobile plant and additional waste transport vehicle movements; however the net increase will be linked to the waste processing over and above the current combined capacities of the existing facility and the SDCC Baling Station and Civic Amenity Area.

It is estimated that the initial annual diesel consumption will be approximately 150,000 litres. This will reduce over time as SEHL expands its compressed natural gas (CNG) fuelled and electrically powered transport fleet.

13.6.5 *Waste Management /Circular Economy*

The proposed development will increase the waste treatment capacity in the Greater Dublin Area by 70,000 tonnes to significantly assist in the achievement and maintenance of national and regional recycling and recovery targets and circular economy initiatives, including the avoidance of single use plastics.

13.7 Likely Future Receiving Environment

If the proposed development does not proceed there will be no increase demands on the electricity network; no increase in fossil fuel consumption by the mobile plant and materials transport vehicles; no generation of electricity from renewable sources and no reduction in the hydraulic loading on the Uisce Eireann storm sewer. There will be no expansion of the waste treatment capacity in the Greater Dublin area and no contribution to achieving circular economy initiatives.

13.8 Prevention & Mitigation Measures

13.8.1 *Design Stage*

13.8.1.1 Energy Efficiency

The requirements for the conservation of fuel and energy for buildings other than dwellings are laid out in Part L of the Second Schedule to the Building Regulations 1997 (S.I. No. 497 of 1997), as amended by the Building Regulations (Part L Amendment) Regulations 2011 (S.I. 259 of 2011), the Building Regulations (Amendment) Regulations 2017 (S.I. 4 of 2017). The Second Schedule, insofar as it relates to works related to buildings other than dwellings is:

L1: A building shall be designed and constructed so as to ensure that the energy performance of the building is such as to limit the amount of energy required for the operation of the building and the amount of carbon dioxide (CO_2) emissions associated with this energy use insofar as is reasonably practicable.

For new buildings other than dwellings, the requirements of L1 shall be met by: –

(a) providing that the energy performance of the building is such as to limit the calculated primary energy consumption and related Carbon Dioxide (CO_2) emissions to a Nearly Zero Energy Building level insofar as is reasonably practicable, when both energy consumption and Carbon Dioxide emissions are

calculated using the Non-domestic Energy Assessment Procedure (NEAP) published by Sustainable Energy Authority of Ireland;

(b) providing that the nearly zero or very low amount of energy required is covered to a very significant extent by energy from renewable sources produced on-site or nearby;

(c) limiting the heat loss and, where appropriate, availing of the heat gains through the fabric of the building;

(d) providing and commissioning energy efficient space heating and cooling systems, heating and cooling equipment, water heating systems, and ventilation systems, with effective controls;

(e) ensuring that the building is appropriately designed to limit need for cooling and, where air-conditioning or mechanical ventilation is installed, that installed systems are energy efficient, appropriately sized and adequately controlled;

(f) limiting the heat loss from pipes, ducts and vessels used for the transport or storage of heated water or air;

(g) limiting the heat gains by chilled water and refrigerant vessels, and by pipes and ducts that serve air conditioning systems;

(h) providing energy efficient artificial lighting systems and adequate control of these systems; and

(i) providing to the building owner or occupants sufficient information about the building, the fixed building services, controls and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and energy than is reasonable.

In accordance with the EU Energy Performance of Buildings Directive Recast (EPBD Recast) 2010/31/EU of 19th May 2010 definition for Nearly Zero Energy Buildings (NZEB) Part L provides for buildings with a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

The above guidance on energy performance was considered at the design stage and the Design Team decided that the appropriate energy options for the development included:

- Installation of roof mounted Photovoltaic (PV) Solar Panels to supplement the electricity supply.
- Provision of energy efficient artificial lighting systems
- Provision of electric vehicle charging points.

A key factor in the selection in the electrically powered plant and equipment that will be used in the new MRF will be their energy efficiency which will reduce the overall energy usage per tonne of materials processed.

13.8.1.2 Surface Water Drainage

The capacity of the proposed storm network was modelled and analysed to cater for a 1-in-100 year rainfall event using the Rational Method. A roughness coefficient (ks) of 0.6mm was used in design to achieve a minimum self-cleansing velocity of 0.75m/s when flowing half full.

An automated shut-off valve will be installed on outfall from the facility to the Uisce Eireann storm sewer that will close in the event of a fire to prevent a release of contaminated water to the Uisce Eireann storm water network.

13.8.2 *Foul Drainage*

An automated shut-off valve will be installed on the foul water outfall from the facility to the Uisce Eireann foul sewer that will close in the event of a fire to prevent a release of contaminated water to the Uisce Eireann foul water network.

13.8.2.1 Natural Resource Consumption

The design mitigation measures implemented to minimise energy usage will also reduce indirect natural resource consumption.

13.8.3 *Construction Stage*

13.8.3.1 Natural Resource Consumption

The Detailed Resource & Waste Management Plan will identify all of the measures to maximise the reuse/recovery of construction and demolition waste generated by the development and also the opportunities to use recycled aggregates in the construction as an alternative to natural materials.

The use of fuels by the construction traffic and the plant and equipment will be minimised by:

- Optimising schedules for the delivery and removal of construction related materials;
- Prohibition of vehicle idling, and
- The proper maintenance and efficient use of construction plant and equipment.

13.8.4 *Operational Stage*

13.8.4.1 Water

There is no scope for mitigation measures in addition to those already ‘designed in’.

13.8.4.2 Foul Water

Given the limited volumes of liquid seepage from the biodegradable wastes, there is no need for mitigation measures.

13.8.4.3 Waste Management

A source segregation system will be provided in the office and canteen where wastes will be separated into recyclables (e.g. paper/plastic), recoverables (food waste) and non-recoverable/recyclables. Food waste from the canteen will be collected and sent off-site with the brown bin wastes. Waste oils,

batteries from plant maintenance and electrical items will be stored in appropriate containers e.g. battery and light bulb boxes, before being sent off-site for recycling. All wastes sent off-site will be transported by authorised waste collectors and go to appropriately authorised waste management facilities.

13.8.4.4 Natural Resource Consumption

The on-site use of the electricity generated by the solar panels in conjunction with the mitigation measures for the reduction of the impact on energy demand, including the use of energy efficient plant and equipment will contribute to the mitigation of the impacts on natural resource consumption.

13.9 Monitoring

13.9.1 *Construction Stage*

The Resource Waste Manager will monitor construction activities to ensure that the waste segregation and storage specified in the RWEMP are implemented.

13.9.2 *Operational Stage*

Energy, fuel and water usage will be monitored.

13.10 Cumulative Effects

As the impermeable area of the site will remain generally the same there will be no material change to volume of rainwater run-off generated. However the SuDs measures based on the infiltration of run-off to ground and rainwater harvesting will reduce the volume discharging to the Uisce Eireann storm sewer and will have a slight positive, long term and local cumulative impact

In the operational stage the proposed development will contribute to the cumulative natural resource consumption in the Greater Dublin Area. The installation of the roof mounted solar panels on the building, the use of more energy efficient plant electrically powered plant and equipment and the closure of the Baling Station will contribute to reducing the cumulative reliance on non-renewable energy sources by commercial/industrial activities in Ballymount Industrial Estate. The development will contribute to a cumulative increase in the waste recycling and recovery capacity in the Greater Dublin Area.

13.11 Residual Impacts

There will be an increased demand on the national electricity grid, but this will be somewhat off-set by the electricity generated in by the solar panels. There will be reduction in the hydraulic loading on the Uisce Eireann storm sewer. In relation to the regional waste management capacity and circular economy initiatives the development will have a positive impact.

13.11.1 *Summary of Residual Impacts*

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration

Construction Stage					
Waste Management	Negative	Not Significant	Subject site	Likely	Temporary
Operational Stage					
Resource Consumption:	Negative	Not Significant	National	Likely	Long Term
Waste Management	Positive	Moderate	Greater Dublin Area	Likely	Long Term
Services Storm Sewer	Positive	Imperceptible	Slight	Likely	Long Term

14. MATERIAL ASSETS: TRAFFIC AND TRANSPORT

14.1 Introduction

This Chapter describes the existing road network and traffic conditions and the impacts of the proposed development, including a 'baseline' scenario. It identifies the prevention, mitigation and monitoring measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts.

This Chapter was prepared by Mr Glen Moon (MA (Hons). Mr Moon is a Principal Engineer with SYSTRA, and a Member of the Chartered Institute of Highways and Transportation. He has over 15 years' experience in the transport planning industry, specialising in the production of Transport Assessments and EIAR assessments across a broad range of commercial developments. This Chapter should be read in conjunction with the Transport Assessment (incorporating a Mobility Management Plan) which is in Appendix 14.1.

14.2 Relevant Legislation & Guidance

In addition to the guidance documents referenced in Section 1.5 of the EIAR the following legislation and guidance were taken into consideration.

- Institute of Environmental Management and Assessment (IEMA) Guideline: 'Environmental Assessment of Traffic and Movement (IEMA, 2023);
- Transport Infrastructure Ireland (TII) Traffic & Transport Assessment Guidelines (2014).
- Project Appraisal Guideline (PAG) Unit 5. 3: Travel Demand Projections (TII) (2019);
- Design Manual for Urban Roads and Streets (DMURS, updated 2019);
- National Cycle Manual (NTA, 2023);
- Project Ireland 2040 – National Planning Framework;
- Dublin City Development Plan 2022-2028;
- Greater Dublin Area Transport Strategy 2022-2042; and
- South Dublin County Development Plan 2022-2028

14.3 Methodology and Significance Criteria

In Ireland, there are currently no definitive guidelines or standards that outline how the effect of traffic and transport should be quantified or described for the purposes of Environmental Impact Assessment. However, TII's 'Traffic and Transport Guidelines' indicate that if the impact generated by the additional traffic associated with new development is expected to exceed 10% of the existing traffic

movements (in the peak hours), it is considered material in the context of the local network. This threshold is reduced to 5% in sensitive situations.

The IEMA Environmental Assessment of Traffic and Movement' (2023) suggests two broad rules to assist in determining the scale and extent of the assessment. The guidelines suggest that links where AADF (Average Annual Daily Flow), or the number of heavy goods vehicle (HGV), increase by more than 30% should be considered for more detailed assessment, or by 10% in sensitive locations.

As referenced in the IEMA Guidelines, a range of indicators for determining the significance of the relief from severance advises that changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes respectively. Additionally, the Guidelines state that it is generally accepted that traffic flow increases of less than 10% on uncongested roads are considered to be 'not significant', given that daily variations in background traffic flow may vary by this amount.

The methodology used to assess the significance of effects at locations along the proposed routes within the study area where total traffic levels exceed the screening thresholds set out by IEMA. Is set out below. Where the impact of operational traffic exceeds 30% on any particular link (10% on sensitive links), then a detailed assessment of the significance of effect was undertaken, which takes account the link sensitivity and the magnitude of change. This considers the criteria set out in the IEMA Guidelines, such as severance, driver delay, pedestrian delay, pedestrian amenity and safety.

14.3.1 *Sensitivity*

The sensitivity to change in traffic levels of any given road segment and the receptors located along that road segment, is generally assessed by considering the residual capacity of the network under existing conditions.

Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic and therefore, the sensitivity may be said to be low. Conversely, where the existing traffic levels are high compared to the road capacity, there is little spare capacity, and the sensitivity to change in traffic levels will be considered to be high.

The criteria that have been used to make judgements on the sensitivity of the receptor(s) and the magnitude of change are presented in Table 14.1.

Table 14.1: Framework for Determining Sensitivity of Receptors

Sensitivity	Description
High	The receptor / resource has little ability to absorb change without fundamentally altering its present character is of international or national importance. Local residents whose daily activities depend upon unrestricted movement within their environment. Receptors such as schools, colleges, hospitals and accident hotspots.
Medium	The receptor / resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor / resource is tolerant of change without detriment to its character, or is of low / local importance. Areas such as trunk road or 'A' class roads constructed to accommodate significant HGV volumes.
Negligible	Users not sensitive to transport effects. Includes very small settlements and roads with no significant settlements including new strategic trunk roads or motorways.

14.3.2 *Magnitude*

The magnitude of effects is a function of the existing traffic volume, the percentage increase and change due to the proposed development, changes in the type of traffic and the temporal distribution of traffic (day of week, time of day). The determination of magnitude was undertaken by reviewing the proposed development, establishing the parameters of the receptors that may be affected and quantifying these effects utilising guidelines and professional judgement.

Consideration was given to the composition of the traffic on the road network, under both existing and proposed conditions. For example, light goods vehicles (LGV) have less effect on traffic and the road system than HGVs. Similarly, heavy goods vehicles (HGV) can have less effect than abnormal load vehicles, depending on the frequency of the abnormal loads.

The criteria that has been used to make judgement on the magnitude of the effect on the receptor(s) is presented in Table 14.2.

Table 14.2 Framework For Determining Magnitude of Effects

Magnitude	Description
Major	Total loss of, or major / substantial alteration to, key elements/features of the baseline (pre-development) conditions such that the post development character/composition/attributes will be fundamentally changed. Generally a rule of >90% (or >70% at sensitive receptors) change in traffic is considered to be a major magnitude.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character / composition / attributes of the baseline will be materially changed. Generally, a rule of 60% - 90% (or 40% - 70% at sensitive receptors) change in traffic is considered to be a moderate magnitude.
Minor	A minor shift away from baseline conditions. Change arising from the loss / alteration will be discernible/detectable but not material. The underlying character / composition / attributes of the baseline condition will be similar to the pre-development circumstances / situation. Generally, a rule of 30 – 60% (or 10% - 40% at sensitive receptors) change in traffic is considered to be a minor magnitude.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation. Generally, a rule of <30% (or <10% at sensitive receptors) change in traffic is considered to be a negligible magnitude.

14.3.3 *Significance*

As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic related effects are set out in Table 14.3. This is based on combining the magnitude of the effect with the receptor sensitivity.

Table 14.3 Significance Criteria Matrix

Sensitivity of Receptor	Magnitude of change			
	Major	**Moderate**	**Minor**	**Negligible**
High	Major	Major/Moderate	Moderate	Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

The effects recorded in the blue highlighted cells are considered to be '**Significant**'. In the context of the EPA Guidance significance is categorised as major, moderate, minor or negligible. Effects judged to be of minor or negligible significance are considered '**Not Significant'**.

14.3.4 *Potential Environmental Effects*

The assessment considers the potential environmental effects relating to traffic and transport. The EPA EIAR guidelines (2022) outline a number of definitions that can be used to describe potential significant effects. This includes definitions for the quality of effects, significance of effects, extent of effects, probability of effects, duration and frequency of effects and the type of effects. While some of these are easily qualified using the EPA guidelines, the significance of the effects is open to interpretation and relies on the professional engineering judgement. Potential significant effects as identified by the IEMA Guidelines including the following:

- Noise;
- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Accidents and safety;
- Hazardous loads (e. g. nuclear products); and
- Dust and dirt

The IEMA guidance suggests that to determine the scale and extent of the assessment and the level of effect a proposed development will have on the surrounding road network, the following two 'rules' should be followed:

- **Rule 1** – Include highway links where flows are predicted to increase by more than 30% (10% if affecting a sensitive area) or where the number of heavy goods vehicles (HGVs) is predicted to increase by more than 30%; and
- **Rule 2** – Include any other specifically sensitive area where traffic flows are predicted to increase by 10% or more.

The IEMA Guidelines identifies the following groups, locations and special interests that may be sensitive to changes in traffic conditions:

- People at home;
- People at work;
- Sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors);
- Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools);
- Retail areas;
- Recreational areas;
- Tourist attractions;
- Collision clusters and routes with road safety concerns; and
- Junctions and highway links at (or over) capacity.

The significance of each effect is considered against the criteria within the IEMA Guidelines, where possible.

14.3.5 *Consultation*

SYSTRA has consulted with South Dublin County Council's (SCCC) Roads Forward Planning team on the scope and requirements of this Transport Assessment. The main points to emerge from consultation were:

- SDCC requested that the site access junction should be made as pedestrian friendly as it can be, and incorporate a refuge island if possible. The proposed final design has been remodelled, with a formal bellmouth being added, and dropped kerbs and tactile paving included. A refuge island was considered, but it was not possible to find a suitable design that would be able to safely accommodate HGV movements.
- A separate pedestrian entrance into the site should be provided. This has been incorporated into the design, with a separate gate providing access to the site offices.
- The proposals should complement / not conflict with the City Edge project. This is considered in Section Section 14.9.1.
- The traffic impact, and redistribution effects, should be considered with the Transport Assessment (TA).

14.4 **Development Description**

Chapter 3 presents a detailed description of the proposed development and those aspects that are relevant to the Traffic Impact Assessment are:

- Pedestrian, cycle and vehicular access into the site will be taken from a slightly relocated simple priority junction on Ballymount Road Upper, which will form the main access into the site.

- Vehicles will enter the site, pass over a weighbridge, and then reverse to unload in one of bays provided. They will then return the same way to exit the site.

- Provision of 43 car parking spaces including 3 disabled and 9 electric vehicles (EV) spaces.

- Twenty-four cycle parking spaces will be provided. These will be located in covered and secure bike stands outside the main warehouse entrance.

14.5 Receiving Environment

14.5.1 *Existing Receiving Roads Environment*

The key roads within the study area are:

R838 Calmount Road

Calmount Road runs north-east from M50 J10. Between M50 J10 and Ballymount Road Upper, it has two lanes in both directions, and a speed limit of 60km/h, to the north of the Ballymount Road Upper, Calmount Road is a single carriageway. Calmount Road ends in a dead-end 600m to the north-east of Ballymount Avenue, meaning that the route to the city centre from the site is via Calmount Road, Ballymount Avenue, and then Ballymount Road Lower.

Ballymount Road Upper/Lower

The site is located on Ballymount Road Upper, which connects Calmount Road with Ballymount Road Lower. It is a single carriageway road with a speed limit of 60 km/h, which provides access to numerous businesses that are located on both sides of the road. The Calmount Road/Ballymount Road Upper junction is a non-signalised roundabout where the geometry does not allow east to west movements onto Ballymount Road Upper.

Yellow hatched markings are in place on the eastern side of the roundabout, which prevents traffic queuing southbound on Calmount Road from blocking west to east movements across the junction on Ballymount Road Upper.

The Ballymount Road Upper/Ballymount Road Lower/Turnpike Road roundabout is located at the western end of Ballymount Road Upper. It is a four-arm priority roundabout, with each entry arm comprising a single lane plus flare.

Turnpike Road

Turnpike Road extends north from the roundabout with Ballymount Road Upper/Ballymount Road Lower, to the R110 near junction 9 of the M50. It is a single carriageway road with a speed limit of 50km/h, which provides access to numerous businesses that are located on both sides of the road.

14.5.2 *Accessibility*

The proposed development is located in Ballymount Industrial Estate, to the east of the M50, between Junctions 9 and 10. The site is accessed via a simple priority junction on Ballymount Road Upper that is the single point of access for vehicles, cyclists and pedestrians.

14.5.2.1 Pedestrian & Cycling Infrastructure

Key elements of the existing pedestrian infrastructure are:

- Footpaths on both sides of Ballymount Road Upper, between Calmount Road and Ballymount Road Lower;
- Dropped kerbs where footpaths cross entrances to businesses on Ballymount Road Upper;
- Uncontrolled pedestrian crossing points at both the Ballymount Road Upper/Ballymount Lower roundabout, and the Calmount Road/Ballymount Road Upper gyratory.

There is presently a limited amount of cycle infrastructure currently in place in the vicinity of the site. This comprises cycle lanes in both directions along Greenhills Road and a short section of southbound cycle track along Calmount Road in the vicinity of the M50.

14.5.2.2 Public Transport

The nearest bus stops are approximately 120m north of the site entrance on Ballymount Road Upper. During the week, the 56A bus service runs between Tallaght and Ringsend at a frequency of approximately 75 minutes during the week. If consented, the proposed 'Greenhills to City Centre' Bus Connects Scheme will greatly improve bus and cycle connections in the area, and would become a key corridor for new bus services and cycle movements between Tallaght and the City Centre.

14.5.3 *Future Roads Infrastructure Objectives*

The South Dublin County Development Plan includes a Six Year Road Programme. As part of the programme it is proposed to upgrade the Greenhills Road from Airton Road to the Walkinstown Roundabout with new links to Ballymount Avenue, Limekiln Road and Calmount Road for BusConnects provisions and long-term residential communities.

If consented, the proposed 'Greenhills to City Centre' Bus Connects Scheme will greatly improve bus and cycle connections in the area, and would become a key corridor for new bus services and cycle movements between Tallaght and the City Centre.

14.5.4 *Existing Network Traffic Flows*

To establish baseline traffic conditions on the local road network, traffic surveys were undertaken in September 2023. These comprised Junction Turning Count (JTC) surveys at three locations and an Automatic Traffic Counter (ATC) at one location as shown in Figure 14.1.

The surveyed junctions were:

1. The Ballymount Road Upper/Ballymount Road Lower roundabout.
2. The site access junction on Ballymount Road Upper.
3. The R838 Calmount Road/Ballymount Road Upper roundabout.

Figure 14.1: **Junction and ATC survey locations (Source Google Maps/SYSTRA annotations**)

The ATC survey was located on Calmount Road to the south of the Ballymount Road Upper roundabout, with a counter in place for 7 days.

SYSTRA calculated the Base 2023 AADF using the 12hr JTC survey results, which have been factored from 12-hour to 24-hour using the ATC on Calmount Road. A factor of 1.2 was calculated from this data. Base 2023 AADF has been calculated for the links in the study area as illustrated in Figure 14.2.

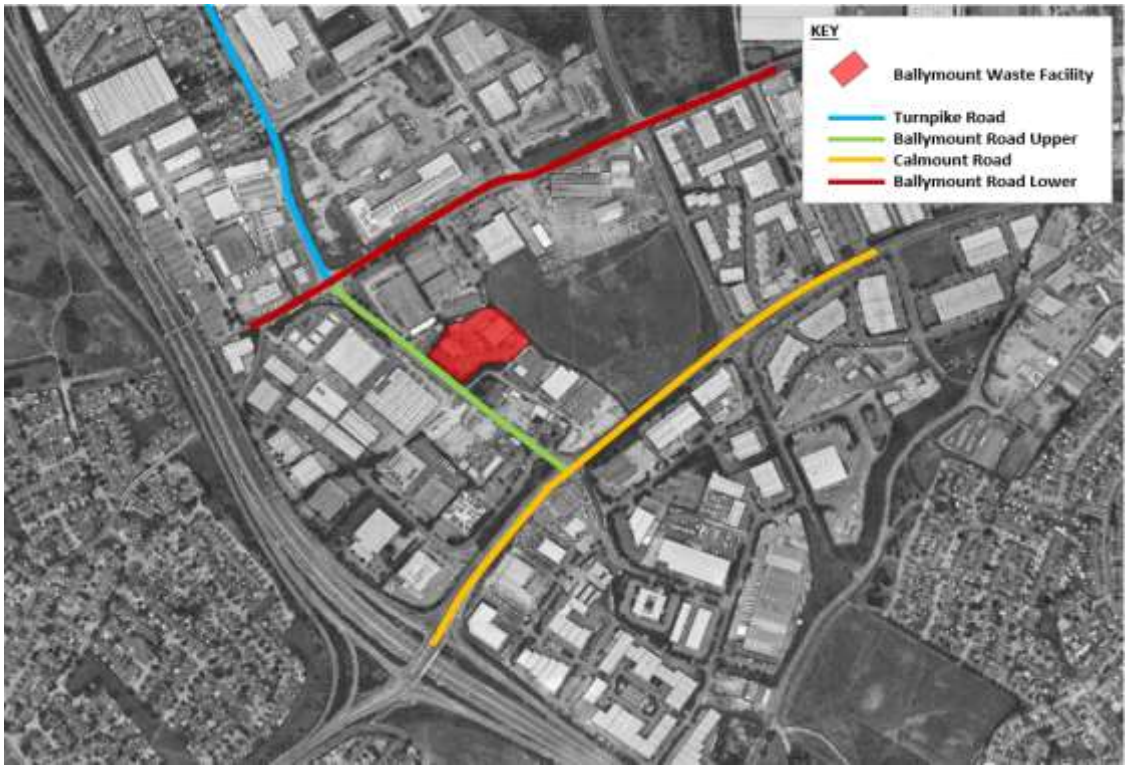

Figure 14.2: Links in the Study Area (Source Google Maps/SYSTRA annotations)

Table 14.4 presents the calculated Base 2023 AADFs for each of the links shown in Figure 14.2. No links in the study area have been identified as 'sensitive' by SYSTRA due to the industrial nature of the area, and absence of residential receptors or services.

Table 14.4: **Base 2023 AADF**

Link Ref	Description	Base 2023 AADF (two-way, vehicles)	Sensitive Link? (as per IEMA Guidelines)	IEMA Threshold for assessment
1	Turnpike Road	11,397	No	30%
2	Ballymount Rd Lower north of Ballymount Road Upper	11,939	No	30%
3	Ballymount Rd Lower south of Ballymount Road Upper	5,175	No	30%
4	Ballymount Rd Upper between Ballymount Rd Lower and Panda	12,186	No	30%
5	Ballymount Rd upper between Panda and Calmount Rd	13,776	No	30%
6	Calmount Rd north of Ballymount Road Upper	9,812	No	30%
7	Ballymount Road Upper east of Calmount Rd	11,157	No	30%
8	Calmount Rd south of Ballymount Road Upper	31,512	No	30%

14.6 Impacts

14.6.1 *Construction Stage*

It is anticipated that the overall construction programme will take 14 months to complete, and comprise the following main stages:

- Site Set Up.
- Demolition of Existing Buildings.
- Construction: Excavation to formation level, building construction and provision of paving and services.
- Building Fit Out.

The proposed working hours will be Weekdays 07:00-18:00 and Saturdays 07:00-12:00. Where feasible the contractor will seek to minimise deliveries during the peak hours (07:30-09:00 and 16:30-18:00). There will be no external construction activities or scheduled deliveries on a Sunday or on Bank Holidays, unless absolutely essential, and agreed in advance with SDCC.

Construction materials will be delivered in heavy goods vehicles and concrete mixing trucks. The construction plant items will include tracked excavators, dozers, dump trucks, telescopic handlers,

backhoe loaders, lifting platforms, mobile cranes, mobile generators and asphalt paving machines. There will be no abnormal load movements to the site.

The busiest times on site, in terms of construction traffic, will be the demolition stage, when the construction debris is removed from the site. During this period, there will be an average 40 HGV arrivals per day, resulting in 80 two-way movements in total. At other times, it is anticipated that there will be in the region of 50 HGV movements, or less, each day. In terms of staff movements, there is anticipated typically be 60 construction workers on site, which may rise to 100 during peak periods.

Assuming a conservative car occupancy of 2, this will result in 50 inbound vehicle trips during the AM peak (prior to 08:00), and 50 outbound vehicle trips from 16:00 onwards. In total, peak daily construction traffic is expected to be; 80 (two-way) HGV movements and 100 (two-way) Car / LGV movements.

The site is well –located to ensure that construction traffic travels along suitable routes to the site. Figure 14.3 shows the proposed routes for HGV traffic.

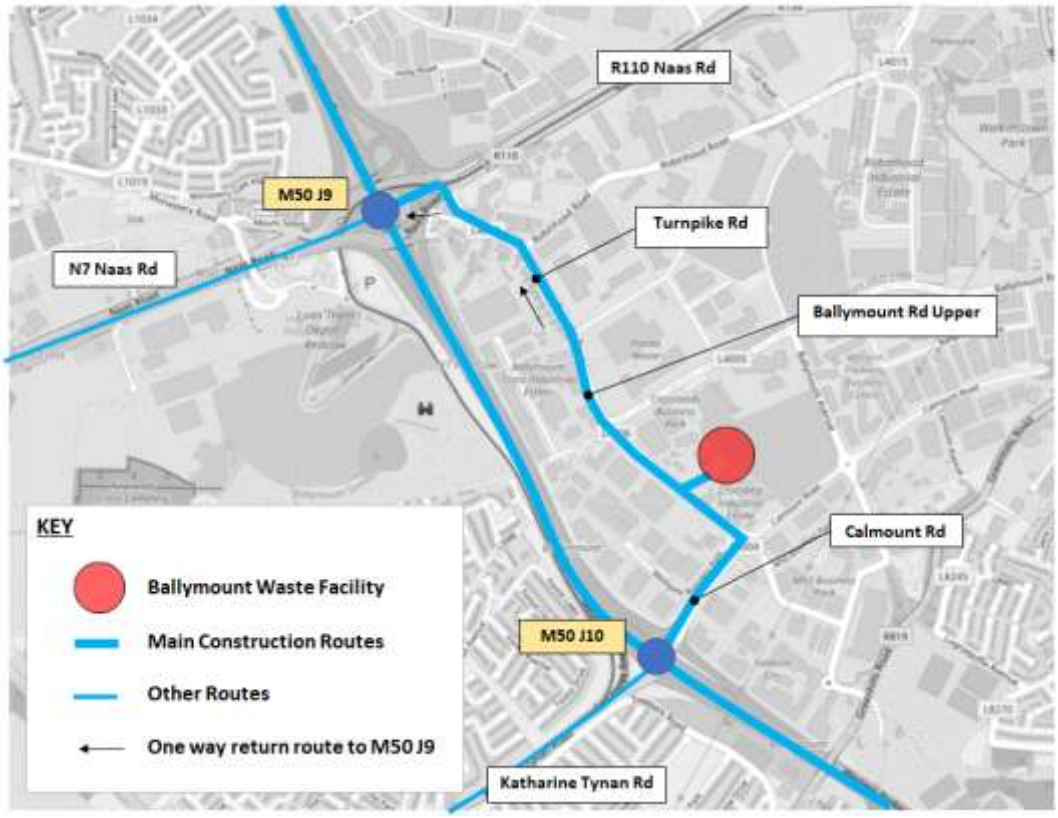

Figure 14.3: Suggested Construction Traffic Routes (Source Google Maps / SYSTRA annotations)

All HGV trips are likely to arrive from either the M50 to the north of J9, and then via J10, Calmount Road and Ballymount Upper. The return journey for these trips will be via Turnpike Road to M50 J9; or the M50 to the south of J10, and then via Calmount Road and Ballymount Road, returning the same way. A small number of trips may arrive from N7 Naas Road to M50 J9, and from Katherine Tynan Road to M50 J10. All of the roads listed above already carry high volumes of traffic (and HGVs), and generally pass through industrial / commercial areas. They are therefore considered by SYSTRA to be suitable for construction traffic.

The details of the proposed construction routeing will be agreed with SDCC, prior to commencement of construction works, with the national road network being used as much as possible. The use of these designated routes can be written into Contractor obligations, and compliance can be assured through

observations, monitoring and if required, enforcement. Table 14.5 shows the predicted daily % impact on the road links on the proposed construction routes, conservatively assuming that all traffic travels on each road link.

Table 14.1: Predicted Construction Stage Vehicle Trips

Link	Base 2025		Construction Traffic		Impact	
	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles
Turnpike Road	1052	9,642	40	100	4%	1%
Ballymount Rd Lower north of BRU	1193	10,100	80	100	7%	1%
Ballymount Rd Upper between BRL and Panda	1370	10,309	80	100	6%	1%
Ballymount Rd Upper between Panda and Calmount Rd	1538	11,654	80	100	5%	1%
Calmount Rd north of BRU	721	8,301	0	100	0%	1%
Calmount Rd south of BRU	2710	26,659	80	100	3%	0%

Table 14.5 shows that the maximum predicted HGV impact is 7% on Ballymount Road Lower (north of BRU). The overall impact, considering all vehicles, results in a less than 1% increase in traffic on each of the links assessed. The construction routes are assessed as being of Low sensitivity, given that they pass through a predominantly industrial / commercial area. The magnitude of change on all links is assessed as being Negligible, as it is below 10% impact. The overall significance of effect is assessed to be temporary, and of Negligible significance, and therefore Not Significant in accordance with the nomenclature in the EPA Guidance on EIAR.

14.6.2 *Operational Stage*

The transport impacts of the proposed development will be to increase numbers of HGV trips to and from the site, with a similar daily profile to existing HGV traffic. Staff travel demand is likely to be similar, or below current levels. Assuming that there is a linear relationship between the volume of waste processed and the number of HGV deliveries required, the total number of daily HGV trips to the site will increase proportionally (by 57%) from 167 to 390 inbound trips. The existing and future inbound profile and volume of HGV traffic on a typical weekday are shown below.

Hour starting	Existing Inbound	Proposed Inbound
00:00	0	1
01:00	1	1
02:00	0	1
03:00	0	0
04:00	4	10
05:00	3	7
06:00	4	9
07:00	6	15
08:00	11	27
09:00	13	31
10:00	17	39
11:00	17	39
12:00	16	38
13:00	19	45
14:00	15	36
15:00	14	32
16:00	13	30
17:00	6	14
18:00	2	5
19:00	1	2
20:00	1	3
21:00	1	3
22:00	1	2
23:00	0	1
TOTAL	167	390

The busiest period for HGV trips is between 10:00 and 16:00, outside typical network peak hours. The majority of this 'new' traffic on the network will redistribute from the Baling Station & Civic Amenity facility, primarily reducing traffic flows on Calmount Road north of the Ballymount Route Upper roundabout, and increasing traffic flows on Ballymount Road Upper.

Traffic demand to and from the development has been distributed through the network based upon the traffic splits observed in the 2023 surveys. This process is detailed in Section 7 of the Transport Assessment in Appendix 14.1.

SYSTRA calculated the Base 2023 AADF using the 12hr JTC survey results, which have been factored from 12-hour to 24-hr using the ATC on Calmount Road. A factor of 1.2 was calculated from this data

Baseline 2023 AADF traffic flows have been factored to the future years of 2025 and 2040 using guidance set out in PAG Unit 5. 3: Travel Demand Projections (TII, 2019). These applied factors are considered to be robust, particularly when considered against the over-arching objectives of CMATS and Climate Action Plan 2023 to reduce traffic levels over the same period. Development traffic was added to these figures, and the percentage impact on the study area road links calculated.

Traffic flows have been calculated for the following scenarios:

- Do Minimum 2025 (Year of Opening).
- Do Something 2025.

The Transport Assessment (Appendix 14.1) also considers the impact of traffic in the Year of Opening + 5 (2030), and Year of Opening + 10 (2040). The EIAR assessment just considers the Year of Opening, as this is when the percentage impact of the development (against baseline traffic) will be highest.

The Do Something scenario represents the 2025 Do Minimum scenario, with traffic from the proposed development added. The development contribution to the future year link flows in the study area is shown in Table 14.26.

Table 14.2: AADF Link Flows (Total Traffic) & Development Contribution

Link Ref	Description	IEMA threshold	Do-Min 2025	Do-Something (Do-min + dev) 2025	Increase	% impact
1	Turnpike Road	30%	11,714	11,7770	56	0.5%
2	Ballymount Rd Lower north of Ballymount Road Upper	30%	12,270	12,371	101	0.8%
3	Ballymount Rd Lower south of Ballymount Road Upper	30%	5,319	5,342	23	0.4%
4	Ballymount Rd Upper between Ballymount Rd Lower and Panda	30%	12,524	12,704	180	1.4%

5	Ballymount Rd upper between Panda and Calmount Rd	30%	14,158	14,443	285	2.0%
6	Calmount Rd north of Ballymount Road Upper	30%	10,085	10,097	-111	-1.1%
7	Ballymount Road Upper east of Calmount Rd	30%	11,467	11,469	1	0.0%
8	Calmount Rd south of Ballymount Road Upper	30%	32,388	32,526	139	0.4%

The figures in Table 14.6 show that the predicted increase in total traffic associated with the proposed development is below the 30% threshold on all links in the study area, therefore no further assessment is required.

Table 14.7 below details the HGV AADF for the 2025 Do-Minimum and Do-Something scenarios. The figures in Table 14.7 show that the predicted increase in HGV traffic associated with the proposed development is below the 30% threshold on all links in the study area, therefore no further assessment is required.

Table 14.7: AADF Link Flows (HGV Traffic) & Development Contribution

Link Ref	Description	IEMA threshold	Do-Min 2025	Do-Something (do-min + dev) 2025	Increase	% Impact
1	Turnpike Road	30%	1,278	1,330	52	4.0%
2	Ballymount Rd Lower north of Ballymount Road Upper	30%	1,449	1,546	97	6.7%
3	Ballymount Rd Lower south of Ballymount Road Upper	30%	531	552	21	3.9%
4	Ballymount Rd Upper between Ballymount Rd Lower and Panda	30%	1,664	1,834	169	10.2%
5	Ballymount Rd upper between Panda and Calmount Rd	30%	1,868	2,141	273	14.6%
6	Calmount Rd north of Ballymount Road Upper	30%	876	764	-112	-12.8%
7	Ballymount Road Upper east of Calmount Rd	30%	940	940	0	0.06%
8	Calmount Rd south of Ballymount Road Upper	30%	3,292	3,421	128	3.9%

14.7 Prevention & Mitigation Measures

The proposed development will not have a significant effect on the local road network during either the construction or operational phases. However, if it is not properly managed, construction traffic does have the potential to create safety issues, and environmental nuisance.

SYSTRA has prepared a Framework Construction Traffic Management Plan (CTMP), a copy of which is Appendix 14.2. The CTMP sets out the principles by which construction traffic will be planned for, managed, and monitored, to ensure that any impacts on local communities, vulnerable users and road users, will be minimised as far as possible.

14.8 Monitoring

In the construction stage the Resource & Waste Manager will monitor construction vehicle movements in and out of the site to ensure the guidance set out in the CTMP is being followed. Monitoring is not required in the operational stage.

14.9 Cumulative Impacts

The following developments have been considered in the cumulative assessment:
SD23A/0135 – Warehouse expansion near Robin Hood Road.
SD23A/ 0071 – Change of use to Recycling Facility
SD23A/0025 – New TII Bus Interchange at Red Cow Interchange
SD/22A/0099 ('The Apex Hub' development)– Warehousing, Office and Restaurant development at Calmount Road / Ballymount Avenue, and associated SD23A/0127
SD/23/0179 – Construction of 3 no. light industrial units on a site at Calmount Road / Ballymount Avenue; and
SD21A.0213 – Additional bus depot parking for Go Ahead Ireland.

Of the above, only the items highlighted in bold are considered by SYSTRA to have a potential material cumulative effect with the proposed development. The location and or scale of the other developments means cumulative effects would be extremely minimal.

SD/23/0179 falls under the overall umbrella assessment of the Traffic and Transport Assessment (TTA) Report prepared for the Apex Hub development (Ref: 210175-DBFL-TR-XX-RP-C-0002, April 2022). Analysis included in TTA shows that the Apex Hub development is expected to have the following traffic impact in the AM and PM peak hours, in its opening year of 2025:

- Ballymount Rd Upper / Ballymount Road Lower – 0.39% AM / 0.56% PM
- Calmount Road / Ballymount Road Upper – 2.24% AM / 2.83% PM

The Apex Hub Development TTA concludes that the development will therefore not have a material impact on the local or national road network. On this basis, the in-combination effects of the proposed development are assessed as Not Significant.

14.9.1 *City Edge*

The City Edge Project is a joint project undertaken by SDCC and Dublin City Council (DCC). It is described as a 'transformative initiative' that aims to re-imagining the Naas Road, Ballymount and Park West

areas at the western edge of Dublin City. The overall aim of the project is to create a new urban quarter, with the potential for 40,000 new homes and 75,000 jobs, making it one of the largest regeneration schemes in Europe.

A Strategic Framework has been prepared setting out a high-level strategy for the future development. The Framework identifies that the City Edge area is well served by public transport – the Luas, the Kildare Railway Line and frequent bus services as well as regional and national roads, but recognises that there is scope to significantly improve active and public transport infrastructure including new rail and Luas stations, new bus routes, and new cycle lanes to support the existing and future population.

The proposed SEHL development is consistent with the City Edge, which foresees an intensification of the area between Ballymount Avenue and the M50, where the proposed development site is located.

At the time of the preparation of this EIAR, the City Edge project is at an early stage, but the proposed SEHL development is consistent with the Strategic Framework. The potential on-street cycle facility will not be affected by the proposed development.

In the absence of more specific information on the traffic changes that will occur as part of the long-term City Edge project, SYSTRA has assumed that current traffic patterns will continue into the future, and that traffic will grow in line with national projections.

14.10 Likely Future Receiving Environment

If the proposed development does not proceed traffic volumes will be as per the future year 'baseline' or 'do-minimum' scenarios set out in Tables 14.6 and 14.7.

14.11 Residual Impacts

Based on the scale and phasing of the development, the haul routes and the implementation of the CTMP, construction stage traffic will not result in any localised traffic congestion in the vicinity of the development site. Construction traffic will have a negative, not significant, local, likely and temporary impact on the local road network. In the operational stage, with the Mobility Management Plan in place, the proposed development will have a negative, not significant, likely, local and long term impact on traffic.

14.11.1 *Summary of Residual Impacts*

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration
Construction Stage	Negative	Not Significant	Local	Likely	Temporary
Operational Stage	Negative	Not Significant	Local	Likely	Long Term

14.12 References

Building Research Establishment (BRE) (2003), Construction Transport, 'The Next Big Thing', (Ref. 14-19).

Department of Housing, Planning and Local Government & Department of Transport (2013).

Design Manual for Urban Roads and Streets (DMURS), (2019).

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

Institute of Environmental Management and Assessment (IEMA) Guideline: 'Environmental Assessment of Traffic and Movement (IEMA, 2023);

Government of Ireland, Project Ireland 2040 – National Planning Framework.

Institute of Environmental Management & Assessment (2003), Guidelines for the Environmental Assessment of Road Traffic.
Project Appraisal Guidelines for National Roads Unit 5. 1 - Construction of Transport Models, October 2016, TII.

Project Appraisal Guidelines for National Roads Unit 5. 3 – Travel Demand Projections, October 2016, TII.

Transport Infrastructure Ireland (TII) (2014), Traffic and Transport Assessment Guidelines.

National Cycle Manual (NTA, 2011).

SDCC City Edge Project: https://cityedge.ie/

Dublin City Development Plan 2022-2028.

Greater Dublin Area Transport Strategy 2022-2042.

South Dublin County Development Plan 2022-2028

15. INTERACTION OF THE FOREGOING

15.1 Introduction

Previous Chapters describe the impacts associated with the proposed development and the prevention and mitigation measures that will be implemented. This Chapter discusses the significance of the actual and potential direct, indirect and cumulative effects of the changes due to interaction between relevant receptor. It is based on the physical and environmental conditions of the subject site and the predicted impacts of the development.

15.2 Population & Health/Air/Material Assets: - Traffic

The proposed development has the potential to impact on human beings from air quality, traffic movements and noise. The local road network has the capacity to accommodate the additional traffic and the air quality assessment has established that the development will not result in any breaches of ambient air quality limits. The noise assessment has determined that noise from night time traffic will have a not significant/slight impact.

15.3 Climate/Water

The effects of Climate Change were factored into the design of the surface water drainage system.

15.4 Climate/Material Assets:

The development will impact on Climate as a result of increased greenhouse gas emissions from traffic and the raw materials consumption in the construction stage and the energy consumption in the operational stage. The cumulative effects will somewhat off-set by the carbon savings associated with electricity generated by the roof mounted solar panels and the recycling of materials that would otherwise have gone to landfill and incineration.

Table 15.1 Interactions

		Climate	Land & Soil	Water	Biodiversity	Air	Population & Human Health	Landscape & Visual Impact	Archaeology Architecture Cultural Heritage	Material Assets	Materials Assets Traffic
Climate				√						√	√
Land & Soil					√						
Water											
Biodiversity											
Air											
Population & Human Health						√					√
Landscape & Visual Impact											
Archaeology & Cultural Heritage											
Material Assets :											
Material Assets : Traffic											

16. SUMMARY OF MITIGATION MEASURES

16.1 Introduction

This Chapter presents a summary of the mitigation measures that were incorporated into the Design Stage and those that will be implemented in the Construction and Operational Stages.

16.2 Design Stage

16.2.1 *Climate*

The design of the surface water drainage system took into account the implications of climate change on future rainfall events.

16.2.2 *Land & Soil*

Given the nature of the development there are no design stage prevention and mitigation measures to reduce the effects of land take.

16.2.3 *Water*

16.2.3.1 Surface Water Management

The sustainable drainage features include:

- Rainwater harvesting;
- Permeable paving in car parking areas, and
- Underground storage systems where the rainwater run-off will be temporarily retained and discharged to ground.

To protect the water quality an oil interceptor, designed to remove oil to levels that do not present a significant environmental risk, will be installed upstream of the attenuation system and the permeable pavement will incorporate measures to biodegrade the small amount of oils that could occur due to leaks from parked vehicles. These mitigation measures also protect soil quality.

16.2.4 *Biodiversity*

It was a design objective to retain the existing boundary hedgerows. A detailed landscape plan has been prepared and it is proposed to augment the boundary hedgerows by planting native shrub species. . The operational lighting scheme will be designed to minimise the impact of external lighting upon bat populations by retaining dark areas around the external boundaries.

16.2.5 *Air*

An odour control system will be installed in the section of the MRF where the odorous wastes will be processed and stored. The system will involve the abstraction of the air and its treatment in a dust filter to remove dusts and carbon filter to reduce odour levels before it is emitted to the air via a stack. The design, installation and operation of the system will require the EPA's prior approval. Fast opening and closing doors will be fitted on the entrances to the section of the building where odorous wastes are handled.

16.2.6 *Population & Human Health*

16.2.6.1 Aviation Safety

The design of the roof top solar panels took into consideration the consideration the Tallaght University Hospital Solar Safeguarding Zone for its helipad.

16.2.6.2 Fire Safety

The separation distances between the buildings means that a fire outbreak in one will not spread to any of the others. In the MRF the internal separation distances between materials storage areas/bays will comply with the EPA guidance on fire safety. Certified automatic fire detection and alarm systems will be installed in both buildings that cover all internal areas. Six mains water supplied fire hydrants will be installed. To prevent/reduce risk of arson there will be a security fence around Phase 1.

16.2.7 *Landscape & Visual Impacts*

The building heights were the lowest that allow the safe internal operations and comply with aviation safety requirements. The height of the stack on the odour control system was determined by the by the air dispersion modelling. The colours of the external building materials were selected to be minimise visual intrusion. It was a design objective to retain the hedgerows around the site boundary and supplement them with additional native tree/shrub plants.

16.2.8 *Cultural Heritage*

Design stage measures are not required.

16.2.9 *Material Assets: Built Services*

16.2.9.1 Energy Conservation

The energy conservation measures include:

- Roof mounted solar panels to supplement the electricity supply;
- Insulation of pipes conveying heated water in the washing system in the FCCP;
- Provision of energy efficient artificial lighting systems, and
- Provision of electric vehicle charging points.

16.2.9.2 Water Conservation

Rainwater will be harvested for use on site as greywater in the staff toilets.

16.2.9.3 Waste Management

The design measures to minimise waste generation in the construction stage will be identified in the Detailed Resource & Waste Management Plan that will be prepared at the detailed design stage.

16.2.10 *Material Assets Traffic & Transport*

The design approach was to:

- Prioritise pedestrians and cyclists in urban settings without unduly compromising vehicle movement, and
- Provide good pedestrian access to encourage walking.

Specific design measures include:

- Use of light emitting diode (LED) luminaires to ensure a uniform lighting spread is achieved and dark corners are avoided;
- Provision of segregated footpaths and cycle lanes on the access road from North Road that will become the future link between North Road and Cappagh Road;
- Provision of shared segregated footpaths and cycle lanes on both sides of the entrance road and the use of high quality and slip resistant materials will at dropped crossings to allow access for users of all abilities, and
- The sightlines at the junctions of the service road and North Road and the development access junction will be 120m from a setback of 3m and positioning of roadside features and landscaping not to obstruct visibility for drivers approaching or emerging from these junctions.

16.3 **Construction Stage**

An Environmental Clerk of Works will be appointed for the duration of the construction stage and will be responsible for ensuring that the following mitigation measures are implemented.

16.3.1 *Climate*

As the impact of the greenhouse gas emissions from the construction stage will not be significant, mitigation measures are not needed, however the following best practices will be use to minimise emission from construction traffic, diesel powered equipment and waste generation.

- Planning routes to minimise travel distances for the delivery and removal of materials;
- Efficient use of construction equipment, and
- Minimisation of waste generated from construction activities.

16.3.2 *Land & Soil*

The mitigation measures include:

- Restricting the storage and handling of oils and chemicals to dedicated areas;
- Provision of appropriate storage containers and spill containment measures to retain accidental spills;
- Provision of appropriate equipment and staff training to ensure any spills are quickly cleaned up;
- Carrying out the soil stripping and stockpiling in a manner that minimises the risk of erosion, and
- Operating machinery and materials storage in ways that minimise the risk of soil compaction.

16.3.3 *Water*

The mitigation measures include:

- Restricting the storage and handling of oils and chemicals to appropriately constructed dedicated areas;
- The provision of appropriate storage containers and bunds to retain accidental spills;
- Provision appropriate equipment and staff training to ensure any spills are cleaned up quickly, and,
- Prohibiting the wash out of concrete delivery vehicles on-site.

16.3.4 *Biodiversity*

The measures to mitigate the effects on soils, water and human beings are also effective in protecting biodiversity. In addition,

- Before the start of construction works an invasive species survey will be carried out to establish if Third Schedule invasive species have entered the site since the original survey was completed. If such species are identified a site-specific Invasive Species Management Plan will be prepared and implemented during the works;
- The invasive species Buddleia is present but it is easy to control using a mixture of mechanical removal and herbicide treatment. As the plants are mature, the preferred method of treatment is cutting back to a basal stump or grubbing out followed by the application of herbicide;
- Site lighting will be at the lowest level needed for safety and security purposes and wherever possible will be will be restricted to the working area and set up to avoid overspill and shadows on sensitive habitats outside the construction area;

- Where possible trees will be not be removed between the bird breeding season of 1st March and 31st August;

- Before felling a bat specialist will inspect the trees. The felled trees will not be mulched immediately and will be left lying several hours and preferably overnight to allow any bats within the tree to emerge and avoid accidental death, and

- Treelines outside the proposed development area but adjacent to it and thus at risk, will be clearly marked by a bat specialist to avoid any inadvertent damage.

16.3.5 *Air*

The following measures will be implemented:

- Water spraying of exposed earthworks and haul road during dry weather using mobile units;

- Provision of a wheel cleaner at the site entrance;

- Regular inspection of the approach roads and cleaning as needed using a road sweeper;

- Control of vehicle speeds within the site;

- Minimising material drop heights;

- Planning materials delivery and waste removal routes to minimise travel distances, and

- Efficient use of construction equipment and resources.

16.3.6 *Population & Human Health*

16.3.6.1 Noise

Although noise emissions will be short term and will not exceed the construction noise criteria following mitigation measures will be implemented.

- Works will generally be confined to 7am to 7pm Monday to Friday and 8am to 2pm on Saturday;

- Where plant has to operate between 7am and 8am at locations within 100m of sensitive receptors, standard 'beeper' reversing alarms will be replaced with flat spectrum alarms;

- Construction machinery will be maintained in a satisfactory condition, with exhaust silencers fitted and in good working order, and

- Queuing of trucks near off-site receptors and engine idling will be prohibited.

The Environmental Clerk of Works will act as a liaison officer with the local community. Where evening or night-time works are required, the Environmental Clerk of Works will inform the residents.

16.3.7 *Landscape*

Additional tree/shrub planting will be carried out to supplement the boundary hedgerows. The habitat protection measures described in Section 16.3.4 will be implemented.

16.3.8 *Cultural Heritage*

Prior to the start of the construction works a suitably qualified and experienced archaeologist will be appointed to monitor topsoil stripping and excavations in the eastern part of Phase 1. If subsurface features of archaeological interest are identified construction works in the immediate area of such features will stop and the archaeologist consult with the National Monuments Service, Department of Housing, Local Government and Heritage to determine what actions are required and these will be implemented.

16.3.9 *Material Assets: Built Services*

The connection to the electricity grid will be managed by ESB Networks, which should limit any disruption and ensure that residents/ businesses in the affected areas receive advance notice of the planned disruptions. Construction and demolition waste will be minimised by implementing the recommendations of the Resource & Waste Management Plan.

16.3.10 *Material Assets: Roads*

A Construction Traffic Management Plan will be prepared based on a scope agreed in advance with Fingal County Council. The objective will be to minimise traffic disruption in the vicinity of the site and ensure the safety of both residents and construction staff.

16.4 **Operational Stage**

16.4.1 *Climate*

Operational mitigation measures are not required.

16.4.2 *Land & Soil*

The above ground storage tank and bund and the underground sewers will be subject to regular inspection to ensure they remain watertight. The paved areas will be regularly inspected and repaired as required to maintain the structural integrity.

16.4.3 *Water*

The above ground storage tank and bund and the underground sewers will be subject to regular inspection to ensure they remain watertight. The paved areas will be regularly inspected and repaired as required to maintain the structural integrity.

16.4.4 *Biodiversity*

The primary mitigation relates to bats, as these are considered the most sensitive species in relation to night time lighting, but it will also lessen the impact on other nocturnal species such as hedgehog and otter. The lighting scheme design will consider:

- Light emitting diode (LED) type bulbs that do not emit ultraviolet and infra-red wave lengths will be used as these are the least disruptive to the emergence of bats from roosts at dusk, and subsequent movement to foraging areas, and

- The height of the lighting columns will be kept as low as possible, bearing in mind the need to prevent damage by vandalism.

16.4.5 *Air*

16.4.5.1 MRF

Wastes will only be accepted and handled inside buildings. The doors of the areas where the odorous wastes are handled will only be opened to allow vehicles to enter and leave. In dry weather paved yards will be damped down to prevent dust emissions from moving vehicles. The diesel powered trucks that transport the wastes will fitted with nitrous oxides reduction systems and engine idling will not be permitted. The EPA licence will set emission limit values for the emissions to air from the odour control unit in the MRF, derived from the odour dispersion modelling assessment.

16.4.5.2 FCCPt

Additional mitigation measures are not required.

16.4.6 *Population & Human Health*

16.4.6.1 Fire Safety

Members of the public will not have access to the facility and only site staff will be permitted inside the processing buildings. Site visitors will be informed of the safety and fire prevention procedures that must be followed and there will be a policy of only smoking in designated areas.

Safe systems of work will be provided and outside contractors will be obliged to undergo safety inductions before being allowed access operational areas. The inductions will address fire procedures, behaviour on site, housekeeping and specific high risk jobs i.e. hot works procedure & permits.

Fire extinguishers will be positioned at selected locations and staff will be trained to extinguish small fires with appropriate hand held fire. If staff members cannot tackle a fire safely and effectively, the evacuation of all personnel will be the primary priority.

16.4.7 *Landscape & Visual Impact Assessment*

Periodic visits will be carried out by the landscape specialist to ensure that any defects that may occur are rectified, that the planting is establishing and being correctly maintained.

16.4.8 *Cultural Heritage*

Mitigation measures are not be required.

16.4.9 *Material Assets Built Services*

Energy efficiency reviews will be conducted regularly and plant and equipment suppliers will be required to ensure that only the most energy efficient are procured. A preventative maintenance programme will be in place for all equipment to ensure their energy efficiency is optimised. To minimise demand on the mains water supply rainwater run-off from the building roof will be used as 'grey water' in the staff toilets. The roof mounted solar panels will reduce demand on the national grid.

16.4.10 *Material Assets: Traffic & Transport*

Mitigation measures are not required.

APPENDIX 1.1

Planning

Our Case Number: ABP-315276-22

Your Reference: Starrus Eco Holdings Ltd.

An Bord Pleanála

Tom Phillips Associates
80 Harcourt Street
Dublin 2
D02 F449

Date: 20 February 2023

Re: Demolition of all existing waste processing buildings on site and construction of a new modernised multi-processing facility.
Panda Waste, Ballymount Road Upper, Ballymount, Dublin 24

Dear Sir / Madam,

I have been asked by An Bord Pleanála to refer further to the above-mentioned pre-application consultation request.

Please find enclosed a copy of the written record of the first meeting of the 14th February, 2023.

If you have any queries in relation to the matter please contact the undersigned officer of the Board.

Please quote the above-mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully,

Ap. K. McGettigan

Niamh Thornton
Executive Officer
Direct Line: 01-8737247

PC07

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An Bord Pleanála

Record of Meeting ABP-315276-22 1st meeting

Case Reference / Description	Demolition of all existing waste processing buildings on site and construction of a new modernised multi-processing facility. Panda Waste, Ballymount Road Upper, Ballymount, Dublin 24		
Case Type	Pre-application consultation		
1st / 2nd / 3rd Meeting	1st		
Date	14/02/23	**Start Time**	11.00 a.m.
Location	N/A	**End Time**	11.35 a.m.

Representing An Bord Pleanála
Ciara Kellett, Director of Planning (Chair)
Kevin Moore, Senior Planning Inspector
Niamh Thornton, Executive Officer
Representing the Prospective Applicant
Brian Minogue, Tom Phillips & Associates
David Tobin, Beauparc

The meeting commenced at 11.00 a.m.

The Board referred to the letter received from the prospective applicant requesting pre-application consultations and advised the prospective applicant that the instant meeting essentially constituted an information-gathering exercise for the Board; it also invited the prospective applicant to outline the nature of the proposed development and to highlight any matters it wished to receive advice on from the Board. The Board mentioned general procedures in relation to the pre-application consultation process as follows:

- The Board will keep a record of this meeting and any other meetings, if held. Such records will form part of the file which will be made available publicly at the conclusion of the process. The record of the meeting will not be amended by the Board once finalised, but the prospective applicant may submit comments on the record which will form part of the case file.
- The Board will serve notice at the conclusion of the process as to the strategic infrastructure status of the proposed development. It may form a preliminary view at an early stage in the process on the matter.
- A further meeting or meetings may be held in respect of the proposed development.
- Further information may be requested by the Board and public consultations may also be directed by the Board.
- The Board may hold consultations in respect of the proposed development with other bodies.
- The holding of consultations does not prejudice the Board in any way and cannot be relied upon in the formal planning process or any legal proceedings.

Presentation by the prospective applicant:

The site of the proposed development is located just off the M50 motorway on Ballymount Road Upper, Dublin. The prospective applicant presented an aerial image of the site, showing an administration office building and existing waste facility. The existing facility has an annual capacity of 150,000 tonnes per annum (TPA). The site is zoned 'To provide for enterprise and employment related uses.

The prospective applicant provided a summary of the proposed development. It is intended to demolish all buildings onsite, relocate core administration functions to Bray, Co. Wicklow, construct a new waste processing shed and ancillary accommodation onsite and increase the annual waste processing capacity from 150,000TPA to 350,000TPA. It was stated that the initial pre-application consultation request was to increase capacity to 300,000TPA but that this had been revised to 350,000TPA.

The prospective applicant stated that the purpose of the proposed development is to maximise the potential of an existing underutilised site and to align with circular economy objectives. The prospective applicant stated that there is a current and growing waste capacity deficit in Dublin, for reasons including sustained economic growth and inward migration.

The prospective applicant described how waste processing is now an extremely complex recovery operation, the complexity of which will continue to grow to meet the needs of a circular economy. The prospective applicant presented an example of the processes, steps and locations involved in the processing of a skip of waste.

The prospective applicant stated that other waste recovery sites in Dublin, citing other sites in Ballymount and Cookstown, have been rezoned to REGEN 'to facilitate enterprise and/or residential-led regeneration'. It was stated that this loss of waste processing sites, due to rezoning, will further increase the waste capacity deficit in Dublin, which in turn increases the need for increased capacity at the prospective applicant's site.

The prospective applicant presented a draft layout plan. It was stated that the proposed facility would operate under a revised EPA licence and that the prospective applicant intends to retain surrounding vegetation along the site boundaries as much

as possible. The proposed development will include a range of sustainability features such as, roof solar panels, rainwater harvesting, LED lighting, and bat and bird boxes.

The prospective applicant stated that it will ensure that all relevant environmental concerns are considered and assessed, including traffic, air, noise and visual. Regarding traffic, it was stated that the traffic pattern will remain the same, with a likely double increase in volume. It is not expected that the effects will be significant. The prospective applicant stated that the air quality around the site is good and air flow into the building will result in negative pressure which will be included as part of the mitigation measures in the EIAR.

A consultation meeting was held with South Dublin County Council in September, 2022. The Council had suggested a green roof but the prospective applicant stated that it will prioritise solar panels on the roof as it considers this will achieve the best environmental outcome. The Council also advised of its preference for nature-based SUDS on site. The traffic department had no issue in principle with the development.

The prospective applicant stated that it considers the proposed development is SID as it is "An installation for the disposal, treatment or recovery of waste with a capacity for an annual intake greater than 100,000 tonnes".

Discussion:

The prospective applicant clarified, when asked, that the proposed development will allow for more processing of waste onsite as opposed to going off site for certain processes. A waste baling station will be provided, for example, which is currently carried out at a facility leased from Dublin City Council.

The prospective applicant confirmed that South Dublin County Council raised no issue in relation to zoning or the 24/7 nature of the operation.

The Board noted that there will be an intensification in the traffic volumes from/to the facility and advised that the management of this should be clearly set out in the EIAR.

The prospective applicant has screened out the need for an NIS.

It was clarified that a review of the EPA licence would be required for the site.

Regarding the three criteria under section 37A of the Planning and Development Act, 2000, as amended, the prospective applicant stated that it considers the proposed development meets all three criteria. Waste will be collected from more than one local authority, the provision of additional waste processing capacity is of national significance and aligns with regional guidelines and policy and the National Planning Framework.

Conclusion:

The record of the instant meeting will issue in due course and the prospective applicant can submit any comments it may have in writing or alternatively bring any comments for discussion at the time of any further meeting. The onus is on the prospective applicant to either request a further meeting or formal closure of the instant pre-application consultation process.

The meeting concluded at 11.35 a.m.

C Kellett 20/2/23

Ciara Kellett

Assistant Director of Planning

APPENDIX 2.1

EPA Licence

LICENCE REG NO W0039-02 HAS BEEN TRANSFERRED

Please note that the licence Reg No W0039-02 was Transferred to Nurendale Limted trading as Panda Waste Services on 10th July 2012. For further information on this please refer to Transfer Notification on the Agency's Website.

This **licence was amended** on 16th December 2015 under Section 76A(11) of the Waste Management Act 1996 as amended. The details of the Amendment must be read in conjunction with this licence. The amendment document is entitled "IED Amendment"

LICENCE REG NO W0039-02 HAS BEEN TRANSFERRED

Please note that the licence Reg No W0039-02 was Transferred to Starrus Eco Holdings Limited from Nurendale Limited trading as Panda Waste Services on 22nd June 2018.
For further information on this please refer to Transfer Notification on the Agency's Website.

P.O. Box 3000,
Johnstown Castle Estate
County Wexford, Ireland

WASTE LICENCE

Waste Licence Register Number:	39-2
Licensee:	IPODEC Ireland Limited
Location of Facility:	Ballymount Cross, Tallaght, Dublin 24.

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Reasons for the Decision

The Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of this licence any emissions from the activity will comply with and not contravene any of the requirements of Section 40(4) of the Waste Management Act, 1996.

In reaching this decision the Agency has considered the application and supporting documentation received from the applicant, and the report of its inspector.

Part I: Activities Licensed

In pursuance of the powers conferred on it by the Waste Management Act, 1996, the Environmental Protection Agency (the Agency), under Section 46(2) of the said Act hereby grants this Waste Licence to IPODEC Ireland Ltd., Ballymount Cross, Tallaght, Dublin 24 to carry on the waste activities listed below at Ballymount Cross, Tallaght, Dublin 24, subject to eleven Conditions, with the reasons therefor and the associated schedules attached thereto set out in the licence.

Licensed waste disposal activities, in accordance with the Third Schedule of the Waste Management Act, 1996

Class 11: Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.

Class 12: Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.

Class 13: Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

Licensed waste recovery activities, in accordance with the Fourth Schedule of the Waste Management Act, 1996

Class 2: Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).

Class 3: Recycling or reclamation of metals and metal compounds.

Class 4: Recycling or reclamation of other inorganic materials.

Class 13: Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

INTERPRETATION

Act	The Waste Management Act, 1996 (No. 10 of 1996).
Adequate lighting	20 lux measured at ground level.
AER	Annual Environmental Report.
Agency	Environmental Protection Agency
Agreement	Agreement in writing.
Attachment	Any reference to Attachments in this licence refers to attachments submitted as part of the waste licence application.
Application	The application by the licensee for this waste licence, including any other material submitted to the Agency in writing by the licensee between the date of the application and the date of grant of this licence.
Annually	All or part of a period of twelve consecutive months.
BATNEEC	Best Available Technology Not Entailing Excessive Cost as defined in section 5 (2) of the Act.
Bi-annually	All or part of a period of six consecutive months.
Bund	A structure to provide containment for any loss of liquid from a storage tank and associated pipework. The Agency's Landfill Design Manual (draft) sets forth design criteria.
Commercial waste	As defined in Section 5 (1) of the Waste Management Act 1996.
Containment boom	A boom which can contain a spillage and prevent it from entering rains or watercourses
Day	A period from 0000 hours to 2400 hours.
Daytime	0800 hours to 2200 hours.
Daily	Consecutive 24 hour periods
Emission	As defined in Section 5 (1) of the Waste Management Act 1996.
EMP	Environmental Management Programme.
Environmental Pollution	As defined in Section 5 (1) of the Waste Management Act 1996.
Every Two Months	One measurement in every two month calendar period.
EWC	European Waste Catalogue: a harmonised, non-exhaustive list of wastes drawn up by the European Commission and Published as Commission Decision 94/2/EC an any subsequent amendment published in the Official Journal of the European Community.
Facility	That area or areas defined under Condition 1.2.
Fugitive Dust	Non-point source dust emissions. For example, dust from vehicular movements on yards.
Hazardous Waste	As defined in Section 4(2) of the Waste Management Act, 1996.
Household Waste	As defined in Section 5 (1) of the Waste Management Act 1996.
Impulsive Noise	As defined in British Standard BS 4142, 1990. "Method for rating industrial noise affecting mixed residential and industrial areas".

Incident	Any reference to an incident in this licence means an incident as defined in Condition 3.1.
Industrial waste	As defined in Section 5 (1) of the Waste Management Act 1996.
Licence	A Waste Licence issued in accordance with the Act.
Licensee	IPODEC Ireland Limited
List I/II Organics	Substances classified pursuant to EC Directives 76/464/EEC and 80/68/EEC
Liquid Waste	Any waste in liquid form and containing less than 20% dry matter
Local Authority	South Dublin County Council.
Maintain	Keep in a fit state, including such regular inspection, servicing and repair as may be necessary to adequately perform its function.
Monthly	At least 12 times per year, once during each calendar month.
Municipal Waste	Municipal waste as defined in Section 5 (1) of the Act.
Night-time	2200 hours to 0800 hours.
Noise sensitive location	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
Oil separator	Device installed according to the draft European Standard prEN 858 (Installations for the separation of light liquids, eg. oil and petrol).
Putrescible waste	Waste which is readily biodegradable such as vegetable matter, green waste, etc.
Sanitary Authority	South Dublin County Council.
Specified Engineering Works	Those engineering works listed in Schedule D of this licence.
Tonal noise	As defined in International Standards Organisation “Acoustics - description and measurement of environmental noise”, Part 2, 1996.
Trade effluent	As defined in the Local Government (Water Pollution) Act, 1977.
Trigger level	A parameter value which when achieved or exceeded requires certain actions to be taken.
Unacceptable Waste	As defined in Condition 5.2 of this licence.
Waste	As defined in Section 4(1) of the Act.
Waste disposal activity	Includes the activities referred to in Section 4 of the Act and listed in the Third Schedule thereto.
Waste recovery activity	Includes the activities referred to in Section 4 of the Act and listed in the Fourth Schedule thereto.
Weekly	During all weeks of plant operation, and in the case of emissions, when emissions are taking place; with no more than one measurement in any one week.
Working Day	0000 to 2400 hours

Part II: CONDITIONS

Condition 1 SCOPE

1.1 Waste activities at the facility shall be restricted to those listed and described in Part I and required by the Licence.

1.2 Waste activities shall be restricted to the area of land outlined in red on the "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99) of the waste licence application. Any reference in this licence to "facility" shall mean the area thus outlined in red.

1.3 Every plan, programme or proposal submitted to the Agency for agreement pursuant to any condition of this licence shall include a proposed timescale for its implementation. The Agency may modify or alter any such plan, programme or proposal in so far as it considers such modification or alteration to be necessary. Every plan, programme or proposal shall be carried out within the timescale fixed by the Agency but shall not be undertaken without the agreement of the Agency.

1.4 This licence is for the purposes of waste licensing under the Waste Management Act (1996) only, and nothing in this licence shall be construed as negating the licensee's statutory obligations or requirements under any other enactments or regulations.

1.5 Where the Agency considers that a non-compliance with the Conditions of this licence has occurred, it may serve a notice on the licensee specifying:

(a) that only those wastes as specified, if any, in the notice are to be accepted at the facility after the date set down in the notice;

(b) that the licensee shall undertake the works stipulated in the notice, and/or otherwise comply with the requirements of the notice as set down therein, within the time-scale contained in the notice.

(c) that the licensee shall carry out any other requirement specified in the notice.

When the notice has been complied with, the licensee shall provide written confirmation that the requirements of the notice have been carried out. No waste, other than that which is stipulated in the notice, shall be accepted at the facility until written confirmation is received from the Agency that the notice is lifted.

1.6 This licence has been granted in substitution for the waste licence granted to the licensee on 25th November 1999 and bearing Register No.: 39-1. This licence replaces the previous waste licence (Reg. No. 39-1).

Reason: To clarify the scope of this licence.

Condition 2 MANAGEMENT OF THE ACTIVITY

2.1 Environmental Management System

2.1.1 The licensee shall before 1st June, 2001 submit to the Agency for its agreement a proposal for a documented Environmental Management System (EMS) for the facility. Following the agreement of the Agency, the licensee shall establish and maintain such a system. The EMS shall be updated on an annual basis with amendments being submitted to the Agency for agreement.

2.1.2 The EMS shall include as a minimum the following elements:

a) Schedule of Environmental Objectives and Targets

The licensee shall, before 1st December 2000, submit to the Agency for its agreement a Schedule of Environmental Objectives and Targets. The Schedule shall address a five-year period as a minimum and shall be reviewed and submitted annually to the Agency for its agreement. The objectives should be specific and the targets measurable.

b) Environmental Management Programme

The licensee shall, before 1st December 2000, submit to the Agency for its agreement an Environmental Management Programme (EMP). The EMP shall include a time-scale for achieving the Schedule of Objectives and Targets and shall comply with any other guidance issued by the Agency. The EMP shall include, as a minimum, the information specified in *Schedule A: Content of the Environmental Management Programme*. The EMP shall be reviewed and submitted to the Agency for its agreement annually.

c) Corrective Action

The licensee shall maintain Corrective Action Procedures (including Emergency Response procedures as per Condition 10.1) which shall ensure that corrective action is taken should specified requirements of this licence not be fulfilled.

d) Awareness and Training

The licensee shall maintain Awareness and Training Procedures for identifying training needs and for providing appropriate training, for personnel whose work is related to the licensed facility. Written records of training shall be maintained.

e) Communications

Before 1st December 2000, the licensee shall submit for agreement to the Agency a Communications Programme to ensure that members of the public can obtain information concerning the environmental performance of the facility at all reasonable times.

2.2 Management Structure

2.2.1. Within one month from the date of grant of this licence, the licensee shall submit written details of the management structure of the facility for the agreement of the Agency. Any proposed changes in the management structure shall be submitted in

writing to the Agency for its agreement. Written details of the management structure shall include the following information:

a) the names of all persons who are to provide the management and supervision of the waste activities authorised by the licence;

b) a named contact person for communications with the Sanitary Authority

c) details of the responsibilities for each individual named under a) above;

d) details of the relevant experience, competence and qualifications held by each of the persons nominated under a) above; and

e) contingency arrangements for the absences of the named persons from the facility.

2.3 Annual Environmental Report

2.3.2. The licensee shall submit to the Agency for its agreement, before the 1st December 2000 and within one month of the end of each year thereafter, an Annual Environmental Report (AER).

2.3.3. The AER shall include as a minimum the information specified in Schedule B: Content of Annual Environmental Report and shall be prepared in accordance with any relevant written guidance issued by the Agency.

2.4 The licensee shall employ a suitably qualified and experienced facility manager who shall be designated as the person in charge. The facility manager or a suitably qualified and experienced deputy, shall be present at all times during the operation of the facility.

2.5 The licensee shall ensure that personnel performing specifically assigned tasks shall be qualified on the basis of appropriate education, training and/or experience, as required and shall be aware of the requirements of this licence.

Reason: To make provision for management of the activity on a planned basis having regard to the desirability of ongoing assessment, recording and reporting of matters affecting the environment.

Condition 3 NOTIFICATION AND RECORD KEEPING

3.1 The licensee shall make written records of the following incidents:

a) any emission which results in the contravention of any relevant standard, including any standard for an environmental medium, or any relevant emission limit value, prescribed under any relevant enactment;

b) any emission which does not comply with the requirements of this licence;

c) any trigger level specified in this licence or in the EMS which is attained or exceeded;

d) any malfunction of any environmental control system;

e) any indication that contamination has, or may have, taken place;

f) any occurrence with the potential for environmental pollution; and,

g) any emergency.

3.2 The written record shall include all aspects described in Condition 10.8 (a to e).

3.3 Unless otherwise instructed in writing by the Agency, the licensee shall notify the Agency by both telephone and facsimile as soon as practicable and in any case not later than 10.00 a.m. the following working day after the occurrence of any incident.

3.4 Unless otherwise instructed in writing by the Agency, the licensee shall submit the written record to the Agency as soon as practicable and in any case within five working days after the occurrence of any incident.

3.5 Should any further actions be taken after the date of notification, as a result of an incident occurring, the licensee shall forward a written report of those actions to the Agency as soon as practicable and no later than ten days after the initiation of those actions.

3.6 In the event of any incident which relates to discharges to surface water, or which affects the interests of the Local Authority, the licensee shall notify the Eastern Regional Fisheries Board and/or South Dublin County Council, as appropriate, as soon as practicable by telephone and in writing and in any case not later than 10.00 a.m. the following day after such an incident.

3.7 Copies of all reports, monitoring and analysis results and interpretations required by this licence, shall be forwarded to the Agency's Headquarters, or to such other alternative location as agreed with the Agency, at the reporting frequencies set out in this licence. The format of all reports and method of reporting shall be in accordance with any written instructions or guidance of the Agency. All monitoring results must be accompanied by a written interpretation of those results setting out their significance. Each report and drawing, including each modification, shall be identified with a unique code. An original and three copies of all reports and results shall be provided to the Agency.

3.8 All written reports submitted to the Agency shall be certified as accurate by the licensee.

3.9 Unless otherwise agreed in writing with the Agency, all written records, reports and other documents required to be maintained under this licence, shall be retained by the licensee for a minimum period of seven years.

3.10 Unless otherwise agreed in advance in writing with the Agency, the licensee must give at least fourteen days notice to the Agency of the following events:

a) the cessation of waste disposal activities at the facility for a period in excess of twenty-eight days;

b) the re-commencement of waste disposal activities at the facility following a period of cessation referred to at a) above.

3.11 The licensee shall provide copies of any written records, reports and other documents referred to in this licence to the Agency upon written request, within the time specified in writing by the Agency.

3.12 The licensee shall keep the following documents at the facility office shown in Drawing "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99), and referred to therein as the Office Block:

a) the current waste licence relating to the facility;

b) any previous waste licence in respect of the facility;

c) the current EMS for the facility;

d) the previous year's AER for the facility;

e) all written procedures produced by the licensee which relate to the licensed activities.

3.13 The licensee shall maintain a written record, or a record in a format to be agreed in writing by the Agency, for each load of waste arriving at the facility. The licensee shall record the following:

a) the name of the carrier;

b) the vehicle registration number;

c) the name of the producer(s)/collector(s) of the waste as appropriate;

d) a description of the waste including the associated European Waste Catalogue (EWC) codes;

e) the quantity of the waste, recorded in tonnes;

f) the name of the person checking the load; and,

g) the time and date of arrival.

The requirement to record EWC codes shall be implemented within three months of the date of grant of this licence.

3.14 A written record shall be kept for each load of waste departing from the facility. The following shall be recorded:

a) the name of the carrier;

b) the vehicle registration number;

c) the destination of the waste (facility name and waste licence/permit number as appropriate);

d) a description of the waste including the associated European Waste Catalogue codes;

e) the quantity of the waste, recorded in tonnes; and,

f) the name of the person checking the load.

g) the time and date of departure.

The requirement to record EWC codes shall be implemented within three months of the date of grant of this licence.

3.15 The licensee shall maintain a written record of all complaints of an environmental nature related to the operation of the activity. Each such record shall give details of the following:

a) date and time of the complaint;

b) the name of the complainant;

c) details of the nature of the complaint;

d) actions taken on foot of the complaint and the results of such actions; and,

e) the response made to each complainant.

3.16 All foul sewer discharge monitoring results, as set out in *Schedule E.1*, shall be submitted annually to the Sanitary Authority.

3.17 The licensee shall notify the Local Authority and the Agency of the occurrence of any one of the following within the time set out in Condition 3.3:

a) any incident with the potential for environmental contamination of surface water or groundwater, on posing a threat to land, or a Sanitary Authority sewer or personnel working in connection with a sewer, or requiring an emergency response by the Local Authority;

b) any emission which relates to a discharge to sewer which does not comply with the requirements of this licence.

Reason: To provide for the notification of incidents, to update information on the activity and to provide for the keeping of records.

Condition 4 SITE INFRASTRUCTURE

4.1 The licensee shall establish all infrastructure referred to in this licence prior to the commencement of the licensed activities or as agreed in advance in writing with the Agency.

4.2 Site Notice Board

4.2.1 A Site Notice Board shall be maintained by the licensee on the facility so that it is legible to persons outside the main entrance to the facility. The minimum dimensions of the identification board shall be 1200mm by 750mm.

4.2.2 The board shall clearly show:

a) the name and telephone number of the facility;

b) the normal hours of opening;

c) the name, address and telephone number of the licence holder;

d) an emergency out of hours contact telephone number;

e) the name, address and telephone number of the operator of the facility if different from (c) above; and,

f) the waste licence reference number.

4.3 Site Boundary

4.3.1 The site boundary landscaping shall be maintained at least to the extent set down in Drawing "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99). Any gaps that exist or develop in this landscaping shall be filled with appropriate plants at the earliest opportunity.

4.3.2 A security fence and appropriate gates shall be provided according to the Drawing "Traffic Control" (No. 9811501, D.1-2, Revision A, April 1998).

4.3.3 The licensee shall remedy any defect in the gates and/or fencing as follows:

a) a temporary repair shall be made by the end of the working day; and

b) a repair to the standard of the original fence shall be undertaken within three working days or as agreed in writing with the Agency.

4.3.4 Gates shall be kept locked shut when the facility is unsupervised.

4.4 Liquid storage

4.4.1 Unless agreed otherwise in writing with the Agency or unless contained in mobile plant at the facility, fuels, waste oils and greases shall be stored at the locations shown in Drawing "Hardcore Areas" (Figure 2, Revision A of the further information supplied to the Agency on the 28th October 1998).

4.4.2 All tank and drum storage areas shall be rendered impervious to the materials stored therein. In addition, tank and drum storage areas shall, as a minimum be bunded, either locally or remotely, to a volume not less than the greater of the following:

a) 110% of the capacity of the largest tank or drum within the bunded area; or

b) 25% of the total volume of substance which could be stored within the bunded area.

4.4.3 All drainage from bunded areas shall be diverted for collection and safe disposal.

4.4.4 All inlets, outlets, vent pipes, valves and gauges must be within the bunded area.

4.4.5 The integrity and water tightness of all the bunds, tanks and containers and their resistance to penetration by water or other materials stored therein shall be tested and demonstrated by the licensee and shall be reported to the Agency. This testing shall be carried out by the licensee at least once every three years thereafter and reported to the Agency on each occasion. The licensee shall also submit to the Agency for its agreement in each case a written report on the storage of fuels on site. A written record of all integrity tests and any maintenance or remedial work arising from them shall be maintained by the licensee.

4.4.6 All tanks and containers shall be labelled to clearly indicate their contents and volume.

4.4.7 All tanks and containers shall be secured against unauthorised access.

4.5 An office shall be provided and maintained on the facility, at the location shown in Drawing "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99) and referred to therein as the Office Block**/**Future Extension. The office shall be constructed and maintained in a manner suitable for the processing and storing of documentation.

4.6 The licensee shall provide and maintain a working telephone and a facsimile machine at the facility.

4.7 A waste quarantine area shall be provided and maintained. Pending the provision of this quarantine area, the temporary quarantine area agreed by the Agency's letter, WL39-1/AK002EM dated 22nd February 2000, shall be employed.

4.8 A weighbridge shall be provided at the location shown in Drawing "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99), and referred to therein as Weighbridge, and shall be maintained in such condition as to accurately measure the weight of all vehicles using it. The accuracy of the weighbridge shall be tested and demonstrated to be in accordance with the manufacturer's specifications, and it shall be reported to the Agency. A written record of such tests and any maintenance or remedial work arising from them shall be maintained by the licensee.

4.9 The drainage system, bunds and oil separators shall be inspected weekly, desludged as necessary and properly maintained at all times. All sludge and drainage from these operations shall be collected for safe disposal. A written record shall be kept of the inspections, desludging, cleaning, disposal of associated waste products, maintenance and performance of the interceptors, bunds and drains.

4.10 The storm and foul sewer systems shall be established and maintained as set out in Drawing "New Location of Fuel Tank and Pump" (Drawing No. B5805-C001-B submitted 10th March 2000) subject to any alterations agreed in advance by the Agency.

4.11 The connection from the Conveyor Belt Sump in the Transfer Station Building to the storm water discharge as set out in Drawing "Monitoring Points" (No. 9811502.01, Revision B, August 1998), shall be terminated in a manner to prevent any liquid passing from the sump to the storm water sewer.

4.12 The waste Transfer Station and Garage/Workshop shall be established and maintained as set out in Drawing "Floor Slab G.A. and details" (No. B2767S04, Revision 1, October 1998) subject to any alteration(s) agreed in advance by the Agency.

4.13 The foul sewer pumps located in the pump sumps of the Loading Bay of the Waste Transfer Station (Drawing "Monitoring Points", 9811502, 01, revision B, August 1998) shall be

maintained according to the manufacturer's instructions. A written record of pump servicing, maintenance and remedial work shall be maintained by the licensee.

4.14 The fog system as agreed by the Agency's letter, WL39-1/AK007EM dated 8th May 2000, shall be installed and subsequently maintained at all times unless otherwise agreed in writing by the Agency. A written record of component/system servicing, maintenance and remedial work shall be maintained by the licensee.

4.15 Before 1st September 2000, all foul sewer gullies, drainage grids and manhole covers shall be painted with red squares whilst all surface water discharge gullies, drainage grids and manhole covers shall be painted with blue triangles. These colour codes shall be maintained so as to be visible at all times during site operation. Any alterations to the site drainage thereafter shall comply with this colour coding within one week of such alterations. All manhole covers associated with oil separators and sediment traps shall also be uniquely numbered (for example OS1, ST1).

4.16 The licensee shall provide adequate lighting during the operation of the facility during the hours of darkness.

4.17 The double-skinned diesel storage tank, as shown in Drawing "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99) and referred to therein as "tank + pump", shall be provided with a bund. Surface water drainage from the fuel dispensing area of this tank, unless contained within the bund, shall be directed through an oil separator.

4.18 An area with an impermeable surface shall be provided for the parking of trucks at the location shown in the Drawing "Hardcore Areas" (Figure 2, Revision A, October 1998) before 1st December 2000 as agreed by the Agency's letter, WL39-1/AK005 dated 3rd April 2000. The drainage from this area shall pass through a suitable oil separator. Other concrete and hard-core hardstanding areas shall be maintained at the locations specified in Drawing "Hardstanding Layout Plan" (Figure D.1.e, Revision A, Nov. '99) subject to any alterations in site drainage agreed in advance in writing by the Agency.

4.19 Vehicle cleaning facilities, including detergent storage, shall be provided and maintained at the location and to the specification agreed by the Agency's letter, WL39-1/AK003EM dated 3rd March 2000, unless agreed otherwise by the Agency.

4.20 All drainage from the floor of the Transfer Station, Loading Bay and the open concrete yard to the east shall be directed to foul sewer.

4.21 The licensee shall provide, install and maintain a system for the detection of a fire inside the Transfer Station, including the Loading Bay. A written record shall be kept of the inspections, testing and maintenance of this system.

4.22 Traffic shall be directed around the site as shown in Drawing "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99).

4.23 Unless agreed otherwise by the Agency, surface water discharges from the facility, other than clean roof water run-off, shall receive Class I full retention oil separator treatment prior to discharge at the location shown in Drawing "Monitoring Points" (Figure J.1.a, Revision A, Nov. '99) before 7th November 2000.

4.24 Specified Engineering Works

4.24.1 The licensee shall submit a written report on any proposed specified engineering works, as defined in Schedule D: Specified Engineering Works, to the Agency for its agreement prior to any works being carried out. No such works shall be carried out without the prior written agreement of the Agency.

4.24.2 All specified engineering works shall be supervised by a competent person(s) agreed in writing in advance by the Agency and that person, or persons, shall be present at all times during which relevant works are being undertaken.

4.24.3 Following the completion of all specified engineering works, the licensee shall submit a construction quality assurance validation report to the Agency. The validation report shall include the following information:

a) a description of the works;

b) as-built drawings of the works;

c) records and results of all tests carried out (including failures);

d) where relevant a drawing and sections showing the location of all samples and tests carried out;

e) daily records sheets/diary;

f) name(s) of contractor(s)/individual(s) responsible for undertaking the engineering works;

g) name(s) of person(s) responsible for supervision of works and for quality assurance validation of works;

h) records of any problems and the remedial works carried out;

i) any other information requested in writing by the Agency; and

j) a comprehensive drawing of the entire facility drainage network including foul sewerage, surface water drainage, fuel, raw material and waste storage locations, waste quarantine area, monitoring stations, cut-off valves, underground services such as electricity cables and their associated manhole covers, vehicle wash area, oil separators, gullies, manhole covers, buildings, truck parking area, pumps, et cetera.

Reason: To provide for the protection of the environment

Condition 5 WASTE ACCEPTANCE AND HANDLING

5.1 Where waste types are not permitted to be accepted at the facility, then those waste types shall not be accepted whether or not they have been packaged, placed in other containers or waste materials, or pre-treated by any form of solidification or encapsulation.

5.2 The following non-hazardous, non-liquid wastes only shall be accepted at the facility:

a) Municipal Waste;

b) Commercial and Industrial waste of similar composition to Municipal Waste; and,

c) The wastes listed in Table E.1.3 of the waste licence application.

5.3 The licensee shall submit a written proposal on any proposed new waste processing procedure, along with relevant details, to the Agency for its agreement prior to any such processes or associated works being carried out.

5.4 The quantity of wastes to be accepted at the facility shall not exceed 150,000 tonnes per annum.

5.5 Waste must only be accepted at the facility from known customers or new customers subject to initial waste profiling as specified in Section 2.5 of the Environmental Impact Statement (EIS) and subject to the conditions of this licence. The written records of this off-site waste profiling shall be retained by the licensee for all active customers and for a two year period following termination of licensee/customer agreements. There shall be no casual public access to the facility.

5.6 Waste arriving at the facility shall be weighed, documented and directed to the Transfer Station building, as shown on the Drawing "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99). The waste shall then be deposited on the floor of the Transfer Station building for visual inspection. Only following visual inspection and assessment shall the waste be processed for disposal or recovery.

5.7 All suspect materials identified by the visual inspection of the waste shall be diverted to the Waste Quarantine Area or other designated area as agreed in advance by the Agency, for further examination and classification. Materials other than those permitted by this licence shall be submitted to an alternative appropriate facility.

5.8 The Unacceptable Waste Procedure EW10 as agreed by the Agency's letter, WL39-1/AK002EM (our reference) dated 22nd February 2000, shall be implemented.

5.9 No waste shall be placed, or allowed to accumulate outside the Transfer Station, as shown on the drawing "Site Boundary Map" (Figure B.2.a, Revision A, Nov. '99), other than waste in fully enclosed trailers/containers pending removal from the site, unless agreed in advance by the Agency. There shall be no liquid discharges from those trailers/containers.

5.10 The blinded hard-core surfaced areas, as delineated in Drawing "Hardstanding Layout Plan" (Figure D.1.e, Revision A, Nov. '99), shall not be used for the storage of waste materials, fuels and other potentially polluting substances unless agreed in advance by the Agency

5.11 Hours of Operation.

5.11.1 Waste may be accepted 24 hours a day, 7 days a week.

5.11.2 Waste which is received at night-time, following its acceptance, shall only be deposited on the floor of the Transfer Station. Unless agreed otherwise by the Agency, cardboard baling and transferring of waste from the floor of the Transfer Station (unless it is unacceptable waste) or any other waste handling or processing shall be restricted to daytime hours.

5.12 Scavenging shall not be permitted at the facility.

5.13 The licensee shall submit proposals for increasing within six months of the date of grant of this licence the separation and recovery of appropriate components of the waste being accepted at the facility to the Agency for its agreement. The targets set for Construction and Demolition wastes in "Waste Management, Changing Our Ways" (Department of the Environment and Local Government, 1998) shall be complied with.

Reason: To provide for the acceptance and management of wastes authorised under this waste licence

Condition 6 ENVIRONMENTAL NUISANCES

6.1 All waste for disposal shall be removed from the facility within thirty six hours of its arrival on-site unless agreed otherwise by the Agency.

6.2 The licensee shall, at a minimum of one week intervals, inspect for nuisances caused by vermin, litter and odours. Written records shall be made of all inspections and any actions taken as a result of these inspections.

6.3 All litter on the site and its environs shall be removed and appropriately disposed of on a daily basis. Dust Curtains, as referred to in Section 3.3.3.(b) of the EIS, shall be maintained on the Transfer Station/Loading Bay plant entry/exit points. All other doors in the Transfer Station shall be kept closed as far as is practicable.

6.4 The Loading Bay and the impermeable outdoor yard areas of the facility shall be maintained in a clean state.

6.5 Waste shall be stored under appropriate conditions in order to avoid putrefaction, odour generation, the attraction of vermin and any other environmental nuisance or objectionable condition.

6.6 Any waste placed on or in the vicinity of the facility, other than in accordance with the requirements of this licence, shall be removed by the licensee immediately such waste is discovered and in any event by 10.00am of the next working day.

6.7 The public highway in the vicinity of the facility shall be kept free from any debris caused by vehicles entering or leaving the facility. Any such debris or deposited materials shall be removed without delay by the licensee.

6.8 The licensee shall ensure that all vehicles delivering and removing waste from the facility are suitably covered, and that there shall be no liquid discharges from the waste transported therein.

6.9 The Vermin Control Plan as agreed by the Agency's letter, WL39-1/AK001EM dated 23rd December 1999, shall be implemented. The objective of the plan is to ensure that vermin do not give rise to nuisance at the facility or the immediate environment of the facility.

6.10 Dust and Odour control shall be implemented as agreed by the Agency's letter, WL39-1/AK007EM dated 8th May 2000, subject to any further instructions issued by the Agency.

Reason: To provide for the control of nuisances.

Condition 7 EMISSIONS AND ENVIRONMENTAL IMPACTS

7.1 No specified emission from the facility shall exceed the emission and deposition limit values set out in Schedule F of this licence. There shall be no other emissions of environmental significance.

7.2 The licensee shall ensure that the activities shall be carried out in a manner such that emissions do not result in significant impairment of, or significant interference with the environment beyond the site boundary.

7.3 There shall be no clearly audible tonal component or impulsive component in the noise emissions from the activity at the facility boundary.

7.4 All treatment/abatement and emission control equipment shall be calibrated and maintained, in accordance with the instructions issued by the manufacturer/supplier or installer. Written records of the calibrations and maintenance shall be made and kept by the licensee.

7.5 There shall be no direct emissions to groundwater.

7.6 Discharges to Surface Water

7.6.1 Discharges to surface water shall only be made at the location SW1 as shown in Drawing "Monitoring Points" (Figure J.1.a, Revision A, Nov. '99).

7.6.2 There shall be no visible oil in the discharge.

7.6.3 Emission limits for emissions to surface water shall be interpreted as follows: For parameters other than pH, eight out of ten consecutive grab sample results shall not exceed the emission limit value. No individual result similarly calculated shall exceed 1.2 times the emission limit value.

7.7 Discharges to Sewer

7.7.1 Discharges to Sewer shall only be made at the location FW1 shown in Drawing "Monitoring Points" (Figure J.1.a, Revision A, Nov. '99).

7.7.2 No substance shall be present in emissions to sewer in such concentrations as would constitute a danger to maintenance personnel working in the sewerage system or as would be damaging to the fabric of the sewer or as would interfere with the biological functioning of a downstream wastewater treatment works.

7.7.3 No emission to sewer shall take place which gives rise to any reaction within the sewer or to the liberation of by-products which may be of environmental significance. In particular, the emission shall not contain any liquid matter (including dissolved methane, petroleum spirits or organic solvents) or thing which is or may be liable to set or congeal at average sewer temperature or is capable of giving off any flammable or explosive gas or any acid, alkali or other substance in sufficient concentration to cause corrosion to sewer pipes, penstock and sewer fittings or the general integrity of the sewer.

7.7.4 Non-trade effluent wastewater (e.g. firewater, accidental spillage) which occurs on-site shall not be discharged to the sewer without the prior authorisation of the Sanitary Authority. The Agency shall be notified of such an event.

7.7.5 The licensee shall provide and maintain an inspection chamber in a suitable position in connection with each pipe through which the trade effluent is being discharged. Each such inspection chamber or manhole shall be constructed and maintained by the licensee so as to permit the taking of samples of the discharge.

7.7.6 The licensee shall permit authorised persons of the Agency and the Sanitary Authority to inspect, examine and test, at all reasonable times, any works or apparatus installed in connection with the trade effluent and to take samples of the trade effluent.

Reason: To control emissions from the facility and provide for the protection of the environment

Condition 8 DECOMMISSIONING AND AFTERCARE

8.1 Decommissioning shall be according to the scheme laid out in Section G.1 – Decommissioning of the application. The licensee shall update the schemes for Decommissioning and Aftercare when required in writing by the Agency and submit any proposed amendments to the Agency for its agreement.

Reason: To provide for decommissioning of the facility and aftercare of the site on which the facility is located.

Condition 9 ENVIRONMENTAL MONITORING

9.1 The licensee shall carry out such monitoring at such locations and frequencies as set out in Schedule E : *Monitoring* and in the conditions of this licence.

9.2 Foul Sewer Monitoring

9.2.1 The licensee shall provide, install and maintain a system for monitoring and recording the discharge volume to foul sewer.

9.2.2 The licensee shall provide, install and maintain a monitoring point for the representative sampling of the final effluent discharge from the facility to the Sanitary Authority foul sewer. A cut-off valve shall be incorporated in the design to stop this discharge if so required.

9.3 Surface Water Monitoring

9.3.1 The licensee shall provide, install and maintain a monitoring point for the representative sampling of the final surface water discharge from the facility to the storm drain located on Upper Ballymount Road. A shut-off valve shall be incorporated in the design to stop this discharge if so required.

9.4 The licensee shall provide and maintain all sampling and monitoring points so that they may be used for the representative sampling and monitoring of emissions from the facility.

9.5 The licensee shall provide safe and permanent access to all on-site and off-site sampling and monitoring points as required by the Agency.

9.6 Monitoring and analysis equipment shall be operated and maintained in accordance with the manufacturer's instructions (if any) so that all monitoring results accurately reflect any emission or discharge or environmental parameter.

9.7 The licensee shall amend the frequency, locations, methods and scope of monitoring, sampling, analyses and investigations only upon the written instruction of the Agency and shall provide such information concerning such amendments as may be requested in writing by the Agency. Such alterations shall be carried out within any timescale nominated by the Agency.

9.8 Unless otherwise agreed in writing with the Agency, a written record shall be kept of the names, qualifications and a summary of relevant experience of all persons who carry out all sampling and monitoring as required by this licence and who carry out the interpretation of the results of such sampling and monitoring.

9.9 The licensee shall install on all emission points such sampling points or equipment, including any data-logging or other electronic communication equipment, as may be required by the Agency. All such equipment shall be consistent with the safe operation of all sampling and monitoring systems.

9.10 The licensee shall undertake a programme of testing and inspection of pipelines to ensure that all underground effluent, storm and foul sewer pipes are tested at least once every three years. A written record of such tests and any remedial work carried out on these pipes shall be maintained by the licensee.

9.11 All on-site monitoring points as described in Condition 9.1 shall be tagged in situ with their agreed sampling point codes as agreed by the Agency.

Reason: To ensure compliance with the requirements of other conditions of this licence by provision of a satisfactory system of measurement and monitoring of emissions

Condition 10 CONTINGENCY ARRANGEMENTS

10.1 The Emergency Response Procedure as agreed by the Agency's letter, WL39-1/AK008EM dated 16th May 2000, shall be implemented unless agreed otherwise by the Agency.

10.2 The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage at the facility. Once used the absorbent material shall be safely stored prior to disposal at an appropriate facility. A written record of the use and disposal of these items shall be maintained by the licensee.

10.3 All significant spillages occurring at the facility shall be treated as an emergency and immediately cleaned up and dealt with so as to alleviate their effects.

10.4 No waste shall be burnt within the boundaries of the facility. A fire at the facility shall be treated as an emergency. Immediate action shall be taken to extinguish it and the appropriate authorities notified.

10.5 The licensee shall carry out a risk assessment to determine if the activity should have a fire-water retention facility. This assessment shall include an investigation into the provision of automatic/remote diversion of surface water to the retention facility. The assessment shall have regard to any guidelines issued by the Agency with regard to firewater retention. The licensee shall submit the assessment and a report to the Agency on the findings and recommendations of the assessment.

10.6 In the event that a significant risk is found to exist for the release of contaminated fire-water, the licensee shall, based on the findings of the risk assessment, prepare and implement, with the agreement of the Agency, a suitable risk management programme. The risk management programme shall be fully implemented within the timescale as notified in writing by the Agency.

10.7 In the event of a complete breakdown of equipment or any other occurrence which results in the closure of the transfer station building, any putrescible waste arriving at or already collected at the facility shall be transferred directly to appropriate landfill sites or any other appropriate facility until such time as the Waste Transfer Station is returned to a fully operational status. Such a breakdown event will be treated as an emergency and rectified as soon as possible.

10.8 In the event that any monitoring, sampling or observations indicate that an incident has, or may have, taken place, the licensee shall immediately:

a) identify the date, time and place of the incident;
b) carry out an immediate investigation to identify the nature, source and cause of the incident and any emission;
c) isolate the source of the emission, if any;
d) evaluate the environmental pollution, if any, caused by the incident;
e) identify and execute measures to minimise the emissions/malfunction and the effects thereof;
f) provide a proposal to the Agency for its agreement within one month to:
    i) identify and put in place measures to avoid recurrence of the incident; and,
    ii) identify and put in place any other appropriate remedial action.

Reason: To provide for the protection of the environment.

Condition 11 CHARGES AND FINANCIAL PROVISIONS

11.1 Agency Charges

11.1.1 The licensee shall pay to the Agency an annual contribution of £8,614 or such sum as the Agency from time to time determines, towards the cost of monitoring the activity, as the Agency considers necessary for the performance of its functions under the Waste Management Act, 1996. The licensee shall in 2001 and subsequent years, not later than January 31 of each year, pay to the Agency this amount updated in accordance with changes in the Public Sector Average Earnings Index from the date of the licence to the renewal date. The updated amount shall be notified to the licensee by the Agency. For 2000, the licensee shall pay a pro rata amount from the date of this licence to December 31 2000. This amount shall be paid to the Agency within one month of the date of grant of this licence.

11.1.2 In the event that the frequency or extent of monitoring or other functions carried out by the Agency needs to be increased due to an incident, or incidents, occurring at, or adjacent to, and associated with the facility, the licensee shall contribute such sums as determined by the Agency to defray its costs.

11.2 Environmental Liabilities

11.2.1 The licensee shall arrange for the completion of a comprehensive and fully costed Environmental Liabilities Risk Assessment for the facility which will address liabilities arising from the carrying on of the activities to which this licence relates or in consequence of ceasing to carry on those activities. A report on this assessment shall be submitted to the Agency for agreement.

11.2.2 Before 1st September 2000**,** the licensee shall make a Proposal for Financial Provision to the Agency for its agreement to cover any liabilities incurred by the licensee in carrying on the activities to which this licence relates or in consequence of ceasing to carry on those activities. Such provision shall be maintained unless otherwise agreed in writing by the Agency.

11.2.3 The amount of financial provision, held under Condition 11.2.2 shall be reviewed and revised as necessary, but at least annually. Any proposal for such a revision shall be submitted to the Agency for its agreement.

11.2.4 The licensee shall within two weeks of purchase, renewal or revision of the financial provision required under Condition 11.2.2, forward to the Agency written proof of such indemnity.

11.3 Sanitary Authority Charges

a) A charge of £0.35 per cubic metre of trade effluent or other matter discharged to sewer.

b) An annual charge of £900 for monitoring costs.

c) These charges shall be paid directly to South Dublin County Council on a quarterly basis.

d) Sanitary Authority charges may increase from time to time in response to increased costs in providing drainage and monitoring.

Reason: To provide for adequate financing for monitoring and financial provisions for measures to protect the environment.

Schedule A : Content of the Environmental Management Programme

Environmental Management Programme
Items specified to be contained in an Environmental Management Plan in the Landfill Operational Practices Manual published by the Agency, or otherwise as agreed in writing with the Agency
Timescale for achieving the objectives and targets listed in the Schedule of Objectives and Targets
Designation of Responsibility for Achieving Targets and Objectives
Other items as specified in writing by the Agency

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SCHEDULE B : Content of the Annual Environmental Report

Annual Environmental Report Content
Reporting Period.
Waste activities carried out at the facility.
Quantity and Composition of waste received, disposed of and recovered during the reporting period and each previous year, including wastes dispatched directly from customers to disposal/recovery facilities.
Summary report on emissions (Certified results/data sheets to be attached as Appendices)
Summary of results and interpretations of environmental monitoring, including a location plan of all monitoring locations along with their respective 12 digit grid references.
Resource and energy consumption summary.
Report on development works undertaken during the reporting period, and a timescale for those proposed for the coming year.
Schedule of Environmental Objectives and Targets for the forthcoming year.
Report on the progress towards achievement of the Environmental Objectives and Targets contained in previous year's report.
Full title and a written summary of any procedures developed by the licensee in the year which relates to the facility operation.
Tank, pipeline and bund testing and inspection report.
Drum, tank and bund testing at least every third year.
Reported Incidents and Complaints summaries.
Reports on financial provision made under this licence, management and staffing structure of the facility, and a programme for public information.
Any other items specified by the Agency.

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SCHEDULE C: Recording and Reporting to the Agency

Table C.1 Recurring Reports

Report	Reporting Frequency[Note1]	Report Submission Date
Monitoring		
(i) Monitoring of emissions to surface water	Quarterly	Ten days after end of the quarter being reported on.
(ii) Monitoring of emissions to sewer	Quarterly	Ten days after end of the quarter being reported on
(iii) Noise monitoring	Annually	One month after the completion of the monitoring
(iv) Dust monitoring	Annually	One month after the completion of the monitoring
Records of incidents	As they occur	See Condition 3.4
Cessation/Re-activation of an activity in accordance with Condition 3.10	As they arise	Fourteen days in advance of cessation/re-activation
Infrastructure		
(i) Bund and tank integrity assessment	Every third year	Within one month of the date of grant of this licence and one month after the end of every year as specified in Condition 4.4.5.
(ii) Weighbridge Accuracy	As they occur	According to manufacturer's specifications.
Environmental Management System Updates	Annually	Before 1/6/2001 and one month after the end of each year being reported on thereafter.
Annual Environmental Report	Annually	Before 1/12/2000 and one month after the end of each year being reported on thereafter.
Financial		
(i) Financial Provision as per Conditions. 11.2.2 and 11.2.3	Annually	Before 1/9/00 and thereafter within the first month of each year being reported on.
(ii) Financial Provision as per Conditions 11.2.4	As they occur	Within two weeks of the purchase, renewal or revision of the financial provision required under Condition 11.2.2

Note 1: Unless altered at the request of the Agency

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SCHEDULE D : Specified Engineering Works

The terms of Condition 4.24 shall apply to the Specified Engineering Works listed in Table D.1 unless stated otherwise.

Table D.1 Specified Engineering Works

Specified Engineering Works
Installation of Waste Quarantine Areas.
Bunding.
Installation of an impermeable parking facility for trucks and site vehicles before 1/12/2000.
Installation of agreed vehicle cleaning area.
Installation of agreed revised drainage to the Transfer Station and the open concrete yard east of same.
Termination of the connection from the Conveyor Belt Sump, which is located in the Transfer Station , to surface water drainage.
Installation of agreed Fire Detection System within the Transfer Station and Loading Bay.
Installation of agreed system to monitor the effluent discharge volume to foul sewer from the facility.
Installation of agreed foul sewer discharge monitoring station and cut-off valve.
Installation of agreed surface water discharge monitoring station, along with a cut-off valve.
Oil separators.
Alterations to facility surface water and/or foul sewer drainage arrangements.
Any other works notified in writing by the Agency.

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SCHEDULE E : Monitoring

E.1: Monitoring of Emissions to Sewer

The permanent monitoring location is to be agreed as per Condition 9.2. In the interim, monitoring shall be carried out at FW1 as shown in the drawing “Monitoring Points” (No. 9811502.01, Revision B, July 1998).

Table E.1.1 Sewer Monitoring Parameters and Frequencies

Parameter	Monitoring Frequency	Sampling Method/Type
BOD	Every two months	Grab
COD	Every two months	Grab
Suspended Solids	Every two months	Grab
Fats, Oil, Grease	Every two months	Grab
Detergents (as MBAS)	Every two months	Grab
Temperature	Every two months	Grab
PH	Every two months	Grab
Flow to Sewer	Daily *Note 1*	To be agreed as per Condition 9.2.1

Note 1: To be estimated fortnightly until agreed monitoring system has been installed as per Condition 9.2.1.

E.2: Dust

Monitoring shall be carried out at D1, D2, D3 and D4 as shown in Drawing "Monitoring Points" (No. 9811502.01, Revision B, July 1998).

Table E.2.1 Dust Monitoring Locations

STATION			
D1	D2	D3	D4

Table E.2.2 Dust Monitoring Parameters

Parameter	Monitoring Frequency	Analysis Method/Technique
Dust Deposition	Three times a year Note 1	Standard Method Note 2 and Note 3

Note 1: Twice during the period May to September, or as otherwise specified in writing by the Agency.
Note 2: Standard method VDI2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Engineering Institute). A modification (not included in the standard) in which 2 methoxy ethanol may be employed to eliminate interference due to algae growth in the gauge is allowed.
Note 3: A wind rose for the relevant monitoring period, obtained from a source approved by the Agency, shall be submitted with the dust monitoring results.

E.3: Noise

Monitoring shall be carried out at B1, B2, B3 and NS1 as shown in the drawing 'Noise Monitoring Location Map', Figure C.8.a, revisions A, November 1999.

Table E.3.1 Noise Monitoring Locations

STATION			
B1	B2	B3	NS1

Table E.3.2 Noise Monitoring Parameters, Frequencies and Method

Parameter	Monitoring Frequency	Analysis Method/Technique
$L(A)_{EQ}$ [30 minutes]	Annually Note 2	Standard Note 1
$L(A)_{10}$ [30 minutes]	Annually Note 2	Standard Note 1
$L(A)_{90}$ [30 minutes]	Annually Note 2	Standard Note 1
Frequency Analysis (1/3 Octave band analysis)	Annually Note 2	Standard Note 1

Note 1: International Standards Organisation. ISO 1996. Acoustics - Description and Measurement of Environmental Noise". Parts 1, 2 and 3.
Note 2: Both during daytime and night-time hours. The report will provide, inter alia, the periods of the measurements, a description of the activities occurring in the facility and a traffic count survey at location NS1 during those periods.

E.4 Monitoring of Emissions to Surface Water

The permanent monitoring location is to be agreed as per Condition 9.3.1. In the interim, monitoring shall be carried out at SW1 as shown in the drawing "Monitoring Points" (Figure J.1.a, Revision A, Nov. '99).

Table E.4.1 Surface Water Monitoring Parameters and Frequencies

Parameter	Monitoring Frequency	Analysis Method/Technique
PH	Monthly	Electrometry
Temperature	Monthly	Thermometry
Electrical Conductivity	Monthly	Electrometry
Total Suspended Solids	Monthly	Gravimetry
Oils , Fats & Grease	Monthly	Standard Method[Note 1]
COD	Monthly	Digestion + Colourimetry/Titrimetry
BOD	Monthly	Electrometry/Titrimetry with nitrification inhibitor
Visual Inspection	Weekly	Not Applicable

Note 1: "Standards Methods for the Examination of Water and Wastewater", (prepared and published jointly by A.P.H.A., A.W.W.A & W.E.F) 19th Ed. 1995, American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005, USA.

SCHEDULE F : Emission Limits

F.1 Emissions to Sewer

Table F.1 Emissions to Sewer ***Note 1***

Parameter	Emission Limit Value		
	Grab Sample (mg/l)	**Daily Mean Concentration (mg/l)**	**Daily Mean Loading (kg/day)**
Biological Oxygen Demand	2000	1500	30
Chemical Oxygen Demand	4000	3000	60
Suspended Solids	1000	800	16
Fats, Oils, Grease	100	100	2
PH	6 - 10		
Maximum Temperature	42 ^{o}C		
Detergents (as MBAS)	100	100	2

Note 1: Maximum volume to be discharged in any one day: 20 cubic metres,
Maximum rate per hour: 5 cubic metres.

F.2 Dust Deposition Limits

Table F.2 Dust Deposition Limits

Level (mg/m^2 /day)[Note 1]
350

Note 1: Based on a 30 day composite sample with the results expressed as mg/m^2 /day at the monitoring points specified in Table E.2.1 other than D.1.

F.3 Emissions to Surface Water

Table F.3 Emissions to Surface Water ***Note 1***

Parameter	Emission Limit Value (mg/l)
Biological Oxygen Demand	20
Suspended Solids	30
Fats, Oils, Grease	10
PH	6 - 10

Note 1: The permanent monitoring location is to be agreed as per Condition 9.3.1. In the interim, monitoring shall be carried out at SW1 as shown in the drawing "Monitoring Points" (Figure J.1.a, Revision A, Nov. '99).

F.4 Noise emissions (Relating to noise emissions from the facility measured at NS1 as shown on drawing number Figure C.8.a titled "Noise Monitoring Location Map")

Table F.4 Noise Emissions

Daytime dB(A) L_{Aeq} (30 minutes)	Night-Time dB(A) L_{Aeq} (30 minutes)
55	45

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Sealed by the seal of the Agency on this 4th day of September, 2000.

PRESENT when the seal of the Agency was affixed hereto:

Anne Butler Director/Authorised Person

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Headquarters
P.O. Box 3000
Johnstown Castle Estate
County Wexford
Ireland

SECTION 76A(11) AMENDMENT TO INDUSTRIAL EMISSIONS LICENCE

Licence Register Number:	W0039-02
Licensee:	Nurendale Limited trading as Panda Waste Services
Location of Installation:	Ballymount Cross, Tallaght, Dublin 24.

Reason for the Decision

The Environmental Protection Agency has examined the terms of licence Reg. No. W0039-02 as required by the provisions of Section 76A(9)(a) of the Waste Management Act 1996 as amended, and determined that the licence can be brought into conformity with the provisions and requirements of Council Directive 2010/75/EU by the exercise of the powers conferred by Section 76A(11) of the Waste Management Act 1996 as amended.

The Environmental Protection Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of licence Reg. No. W0039-02 granted on 4th September 2000, any amendments granted to date, as well as any amendments noted herein, the carrying on of the activity will comply with and not contravene any of the requirements of Section 40(4) of the Waste Management Act 1996 as amended.

Amendment

In pursuance of the powers conferred on it by Section 76A(11) of the Waste Management Act 1996 as amended, the Agency amends Licence Reg. No. W0039-02 granted to Nurendale Limited trading as Panda Waste Services, Rathdrinagh, Beauparc, Navan, County Meath.

Henceforth, the licence shall be read in conjunction with any other amendment to the licence and the amendments set out below.

From the date of this amendment, licence register number W0039-02 shall be deemed to be an Industrial Emissions Licence granted under Part IV of the Environmental Protection Agency Act 1992 as amended and shall not be a waste licence or revised waste licence.

This amendment is limited to the following Interpretation, Conditions and Schedule of Activities Licensed of Licence Reg. No. W0039-02:

Amendments

Amend the Interpretation as follows:

To be inserted into the Interpretation of the existing licence or where relevant replace the existing term.

BAT conclusions	A document containing the parts of a BAT reference document laying down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, relevant site remediation measures.
BAT reference document	A document drawn up by the Commission of the European Union in accordance with Article 13 of the Industrial Emissions Directive, resulting from the exchange of information in accordance with that Article of that Directive and describing, in particular, applied techniques, present emissions and consumption levels, techniques considered for the determination of best available techniques as well as BAT conclusions and any emerging techniques.
Facility	A site or premises used for the purpose of the recovery or disposal of waste or an installation.
Groundwater	Has the meaning assigned to it by Regulation 3 of the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010).
Industrial Emissions Directive	Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast).
Installation	A stationary technical unit or plant where the activity concerned referred to in the First Schedule of EPA Act 1992 is or will be carried on, and shall be deemed to include any directly associated activity, which has a technical connection with the activity and is carried out on the site of the activity.
Waste	Any substance or object which the holder discards or intends or is required to discard.
Waste licensing under the Waste Management Act 1996	Any reference within Condition 1: *Scope* of this licence to "waste licensing under the Waste Management Act 1996" or any similar construed reference shall be deemed to mean a reference to "industrial emissions licensing under the Environmental Protection Agency Act 1992 as amended."

Replace the first paragraph of Part I: Activities Licensed of the existing licence with the following:

Schedule of Activities Licensed

In pursuance of the powers conferred on it by the Waste Management Act, 1996 as amended, the Environmental Protection Agency (the Agency), under Section 46(2) of the said Act hereby grants this Waste Licence to Nurendale Limited trading as Panda Waste Services, to carry on the waste activities listed below at Ballymount Cross, Tallaght, Dublin 24, subject to conditions, with the reasons therefor and the associated schedules attached thereto set out in the licence.

Amend the 'Activities Licensed' as follows:

11.4(b)(ii)	Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, (other than activities to which the Urban Waste Water Treatment Regulations 2001 (S.I. No. 254 of 2001) apply): pre-treatment of waste for incineration or co-incineration.
11.1	The recovery or disposal of waste in a facility, within the meaning of the Act of 1996, which facility is connected or associated with another activity specified in this Schedule in respect of which a licence or revised licence under Part IV is in force or in respect of which a licence under the said Part is or will be required.

Notwithstanding the foregoing, any limitations on waste recovery and disposal activities specified in this Part in accordance with the Third Schedule and Fourth Schedule of the Waste Management Act 1996 as amended including, where applicable, any refused waste disposal and recovery activities from the Third Schedule and Fourth Schedule of the Waste Management Act 1996 as amended shall continue to apply.

New Conditions or Amended Conditions

Insert New Condition 1.7, to read as follows:

Condition 1. Scope

1.7 No alteration to, or reconstruction in respect of, the activity, or any part thereof, that would, or is likely to, result in

(i) a material change or increase in:

- the nature or quantity of any emission;
- the abatement/treatment or recovery systems;
- the range of processes to be carried out;
- the fuels, raw materials, intermediates, products or wastes generated, or

(ii) any changes in:

- site management, infrastructure or control with adverse environmental significance;

shall be carried out or commenced without prior notice to, and without the agreement of, the Agency.

Reason: *To clarify the scope of this licence.*

Replace existing Condition 2.1.2 c) of the licence with the following:

Condition 2. Management of the Activity

2.1.2 The EMS shall include as minimum of the following elements:

c) Corrective and Preventative Action

(i) The licensee shall establish, maintain and implement procedures to ensure that corrective and preventative action is taken should the specified requirements of this licence not be fulfilled. The responsibility and authority for persons initiating further investigation and corrective and preventative action in the event of a reported non-conformity with this licence shall be defined.

(ii) Where a breach of one or more of the conditions of this licence occurs, the licensee shall without delay take measures to restore compliance with the conditions of this licence in the shortest possible time and initiate any feasible preventative actions to prevent recurrence of the breach.

(iii) All corrective and preventative actions shall be documented.

Reason: *To make provision for management of the activity on a planned basis having regard to the desirability of ongoing assessment, recording and reporting of matters affecting the environment.*

Replace existing Condition 3.3 of the licence with the following:

Condition 3. Notification and Record Keeping

3.3 The licensee shall notify the Agency by both telephone and either email or webform, to the Agency's headquarters in Wexford, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following:

(i) an incident or accident that significantly affects the environment;

(ii) any release of environmental significance to atmosphere from any potential emissions point including bypasses;

(iii) any breach of one or more of the conditions attached to this licence;

(iv) any malfunction or breakdown of key control equipment or monitoring equipment as set out in this licence which is likely to lead to loss of control of the abatement system;

(v) any incident with the potential for environmental contamination of surface water or groundwater, or posing an environment threat to air or land, or requiring an emergency response by the Local Authority.

The licensee shall include as part of the notification, date and time of the incident, summary details of the occurrence, and where available, the steps taken to minimise any emissions.

Reason: *To provide for the collection and reporting of adequate information on the activity.*

Insert New Condition 5.14, to read as follows:

Condition 5. Waste Acceptance and Handling

5.14. Materials Handling

5.14 The licensee shall ensure that waste generated in the carrying on of the activity shall be prepared for re-use, recycling or recovery or, where that is not technically or economically possible, disposed of in a manner which will prevent or minimise any impact on the environment.

Reason: *To provide for the appropriate handling of material and the protection of the environment.*

Replace existing Condition 8 of the licence with the following:

Condition 8. Decommissioning and Aftercare

8.1 Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery any soil, subsoil, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

8.2 Decommissioning Management Plan (DMP)

8.2.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for the decommissioning or closure of the site or part thereof. This plan shall be submitted to the Agency for agreement within six months of the date of this amendment.

8.2.2 The plan shall be reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the agreement of the Agency.

8.2.3 The licensee shall have regard to the Environmental Protection Agency's Guidance on Assessing and Costing Environmental Liabilities (2014) and, as appropriate, Guidance on Financial Provision for Environmental Liabilities (2015) and, where available, the baseline report, when implementing Conditions 8.2.1 and 8.2.2 above.

8.3 The Decommissioning Management Plan shall include, as a minimum, the following:

(i) a scope statement for the plan;

(ii) the criteria that define the successful decommissioning of the activity or part thereof, which ensures minimum impact on the environment;

(iii) a programme to achieve the stated criteria;

(iv) where relevant, a test programme to demonstrate the successful implementation of the decommissioning plan; and

(v) details of the costings for the plan and the financial provisions to underwrite those costs.

8.4 A final validation report to include a certificate of completion for the Decommissioning Management Plan, for all or part of the site as necessary, shall be submitted to the Agency within three months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.

Reason: *To make provision for the proper closure of the activity ensuring protection of the environment.*

Replace existing Condition 10.1 of the licence with the following:

Condition 10. Contingency Arrangements

10.1 Accident Prevention and Emergency Response

10.1.1 The licensee shall ensure that a documented Accident Prevention Procedure is in place that addresses the hazards on-site, particularly in relation to the prevention of accidents with a possible impact on the environment. This procedure shall be reviewed annually and updated as necessary.

10.1.2 The licensee shall ensure that a documented Emergency Response Procedure is in place that addresses any emergency situation which may originate on-site. This procedure shall include provision for minimising the effects of any emergency on the environment. This procedure shall be reviewed annually and updated as necessary.

Insert New Condition 10.8 g), to read as follows:

10.8 g) notify the Agency and other relevant authorities.

Insert New Condition 10.9, to read as follows:

10.9 Where an incident or accident that significantly affects the environment occurs, the licensee shall, without delay take measures to limit the environmental consequences of the incident or accident and to prevent further incident or accident.

Reason: *To provide for the protection of the environment.*

Insert New Condition 12, to read as follows:

Condition 12. Resource Use and Energy Efficiency

12.1 The licensee shall carry out an audit of the energy efficiency of the site within one year of the date of this amendment. The audit shall be carried out in accordance with the guidance published by the Agency, "Guidance Note on Energy Efficiency Auditing". The energy efficiency audit shall be repeated at intervals as required by the Agency.

12.2 The audit shall identify all practicable opportunities for energy use reduction and efficiency and the recommendations of the audit will be incorporated into the Schedule of Environmental Objectives and Targets under Condition 2 above.

12.3 The licensee shall identify opportunities for reduction in the quantity of water used on site including recycling and reuse initiatives, wherever possible. Reductions in water usage shall be incorporated into the Schedule of Environmental Objectives and Targets.

12.4 The licensee shall undertake an assessment of the efficiency of use of raw materials in all processes, having particular regard to the reduction in waste generated. The assessment should take account of best international practice for this type of activity. Where improvements are identified, these shall be incorporated into the Schedule of Environmental Objectives and Targets.

Reason: *To provide for the efficient use of resources and energy in all site operations.*

This amendment shall be cited as a Section 76A(11) Amendment and should be read in conjunction with licence Reg. No. W0039-02 granted on 4th September 2000 and any other amendments to the licence.

Sealed by the seal of the Agency on this the 16th day of December 2015

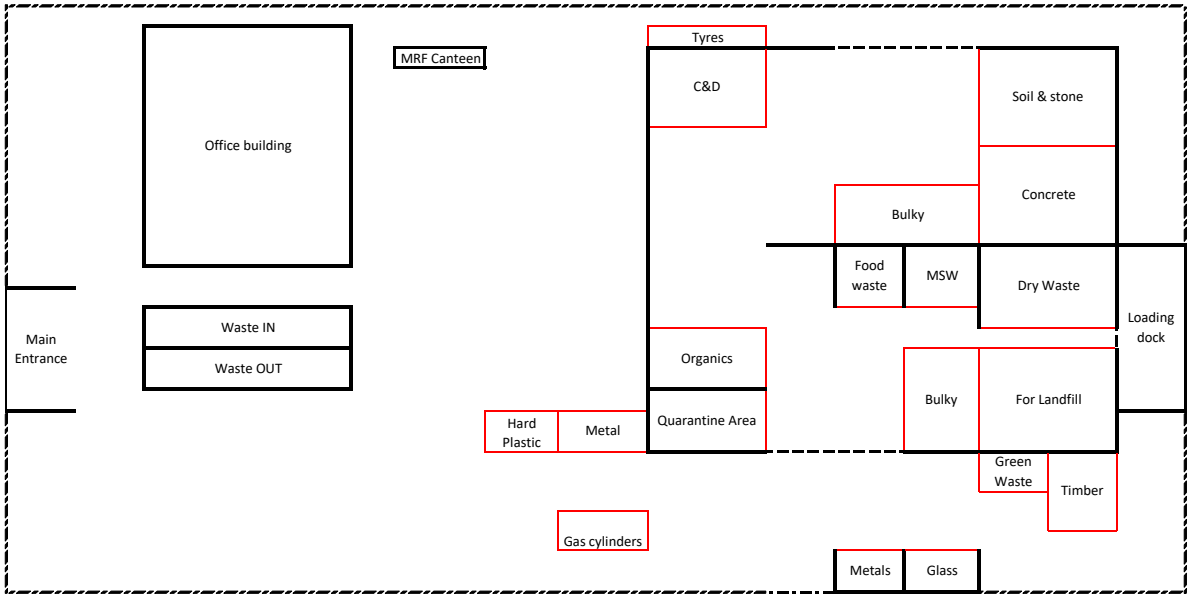
PRESENT when the seal of the Agency was affixed hereto:

Mary Turner, Authorised Person

APPENDIX 2.2

Waste Storage Plan

WTS W0039-02 Waste Storage Plan



Area	Limit Tonnage	Holding Period for Waste	Max Stockpile Size m3
C & D	100	4 days	7x6x10m
For Landfill (insulation)	50	1-2 days	10x7x10m
MSW	200	4 days	10x15x10m
Organics	75	1 day	7x7x6m
Batteries	1	Until enough for a load	1x1x1m plastic box
Metal	40	5 days or enough for a load	6x5x6m
Dry Waste	75	2-3 days	7x10x10m
Plasterboards	10	4 days	7x6x10m
WEEE	2	Until enough for a load	6 cages
MDF	30	4 days	10x10x6m
Soil & Stones	50	4 days	6x6x6m
Hard Plastics	10	Until enough for a load	3 x 40 ft skips (outside) & 3x5x5 (inside)
Green Waste	40	2-3 days until enough for a load	7x7x6m
Timber	100	4 days	10x10x6m
Non Ferrous + Cables	5	Until enough for a load	6x5x6m
Tyres	2	Until enough for a load	2 x 14 CY skips
Cyliners	1	Until enough for a load	3 cages
DMR	10	2-3 days	7x7x6m
Glass	25	Until enough for a load	6x5x6m
Total	826		

APPENDIX 2.3

Odour Management Plan

Waste Transfer Station
Ballymount Cross, Ballymount Road, D24
D24 EO97

W0039-02

Odour Management Plan

Revised date:

08th November 2023

Revised by Devitha Venkatesh

1. Introduction

This document aims to address any odour issues that might arise on our premises or outside boundaries by developing a comprehensive management program that highlights potential sources, preventive measures, corrective actions, and incident response. Our goal is to quickly identify a potential odour source, deal with it in an efficient manner, and prevent any similar occurrences from becoming a nuisance. The latest EPA "Odour Emissions Guidance Note (Air Guidance Note AG9)" from September 2019 was used to develop this report.

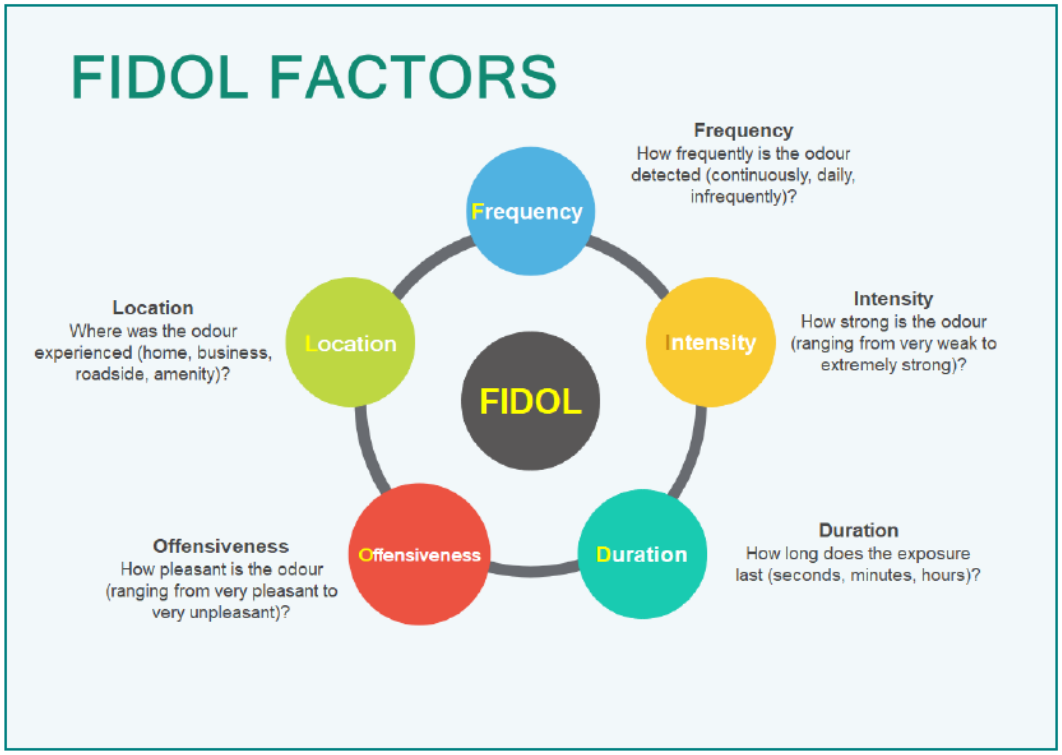
The management plan is required to mitigate any odour nuisances that may occur during the operation of the site. The facility is authorised to accept 150,000 tonnes per annum of municipal waste, commercial and industrial waste of similar composition to municipal waste and wastes as listed in the Table E.1.3 of the waste licence application.

In that regard, company directors, senior management and site management are all part of the emergency response team, therefor, they will have full responsibility and overlook on all company procedures.

As per the EPA AG9 guideline notes, an odour can be described as:

- ***"A response of the olfactory receptor in the nose to certain types of volatile chemicals present in the atmosphere'', and***
- ***"The characteristic property of a substance which makes it perceptible to the sense of smell".***

Every individual reacts differently to a certain set of odorous chemicals but more than likely, a waste type odour would likely cause offence depending of the frequency, intensity, duration, offensiveness, and location. This is being referred by the Agency as FIDOL and are the main factors used to determine odour. In a waste facility, odour is most likely caused by a number of chemical compounds like hydrogen sulphide, mercaptans and nitrogenous compounds that are giving the rotten, acrid like smell. Studies shown that odour exposure are linked to nausea, headaches, dizziness, tension and nervousness.



Waste facilities are likely to be at high risk of causing an odour nuisance due to type of material handled and most of the time, these issues are due to stack emissions, ineffective abatement systems, waste storage and waste handling (loading, unloading), leaks or human errors (spills, open doors, etc.)

The Best Available Techniques (BAT) Reference Document for Waste Treatment (EC, 2018) (WT BREF) refers to several measures that can be implemented to reduce potential emissions generated by waste processes. This includes rejection of odorous loads, fast turnaround of material, the use of chemicals in reduction of odorous chemicals and abatement systems.

2. General information

An odour management plan (OMP) would have to tackle any aspects that might cause odour nuisance, tackle an incident, and ensure no recurrence. Site management will have to ensure that this plan is being reviewed at least annually or as often as possible. High risk areas will be prioritised and specific events, processes will be identified and tackled to ensure no odour nuisance is being caused outside premises.

Prevailing wind direction is presented in appendix 1, Dublin airport data show most frequent south west winds.

The main odour sources on site could be attributed to the nature of waste on site accepted into the facility.

The waste types accepted at the facility are as follows:

- Mixed Municipal Waste (Dry commercial, domestic and commercial black bin)
- Source Segregated Biodegradable waste (brown bin – commercial and domestic)
- Mixed Construction & Demolition waste
- Wood

3. Odour prevention plan

Any potential odour nuisance would be generated from mixed municipal waste. Due to storing this material longer than 24 hours, or a large volume of material being stored especially during warm weather conditions could result in an odour nuisance, however it is common practice to not store this waste more than 24 hours.

3.1 Overall main preventive actions

Several preventive actions are being taken to ensure all processes are working effectively. These must be reviewed and ensure efficiency. Frequency might need to be adjusted as required.

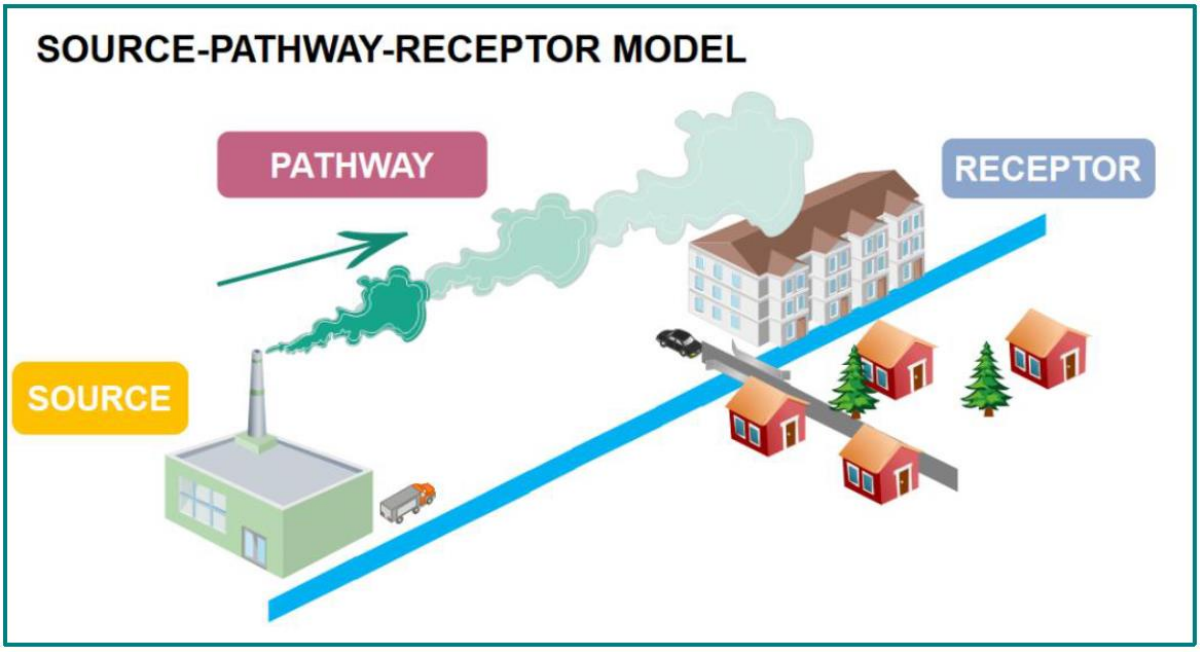
1. Odour Management Plan to be reviewed annually to ensure effectiveness.
2. Company policies and procedures reviewed frequently.
3. Preventive maintenance programmes in place for all equipment and building structures. This includes the odour suppression system and mobile plant.
4. Odour neutralising agent to be added to the misting system located on doorways to waste transfer buildings including loading pit to prevent the escape of any potential nuisance odours from the waste on site.
5. Frequent checks that aim at ensuring no nuisance is caused outside premises.
6. Corrective actions and preventive measures to ensure no recurrence.
7. Cleaning of concreted surfaces leading to weighbridge and entrance to buildings daily. Road sweeper is scheduled daily.
8. Litter picking to be in progress at all times.
9. All staff on site have the responsibility to immediately report and act on incidents that may occur (litter in the yard, potential odour source from any other waste stream, any odour detected to be reported, even from outside sources).
10. In the event of odour being detected, corrective action procedure in place and to be implemented immediately.
11. As requested, off site odour assessments are to be conducted using AG5 guidelines. Attached in Appendix 2 used map. All findings are to be communicated with site management and actions taken if required.
12. Ensuring Cladding is in place on all areas of the building.
13. Shed floor cleaned regularly.
14. All trailers incoming/outgoing are not to park in the yard and queues to be kept to the minimum. All loading, unloading, tipping of odorous materials are to only be loaded inside the shed. All trailers must be sealed and over on before entering or exiting the baling shed.

15. Fast turn-around times for the waste streams will ensure that no odour generating waste builds up on the facility. We operate a “first in, first out” policy to eliminate risk of anaerobic digestion.

3.2 Awareness training

Training must be carried out frequently to ensure good communication with staff personnel. This must include:

- ✓ Why and how odour nuisance is controlled on site. Include details on the odour abatement system functionality.
- ✓ General housekeeping importance including maintenance, record keeping, daily checks and waste storage plan.
- ✓ Details related to preventive measures implemented and incident actions required to be taken in the event of a nuisance.
- ✓ Details related to source-pathway-receptor model to ensure staff understands the importance of preventive measures implemented.



4 Site inspections and checks

All daily and weekly check sheets aim at preventing any incidents from becoming a nuisance. Therefore, site management have been developing a number of checks that reduce the probability of an incident occurring.

4.1 Daily Check Sheets

Appendix 3 includes a template of daily checks that must be conducted on a daily bases in order to identify any odorous impact on the site. Site management are conducting these daily in order to identify any nuisance. If any nuisance is discovered, these are brought to site management's attention and issue tackled. A corrective action form is then being filled in and appropriate measures taken.

4.2 Odour abatement system checks

Odour abatement system is being checked weekly by site manager or deputy manager. Any issues are to be rectified immediately and a corrective action form is then being filled in. Preventive measures to be implemented as required.

5 Odour Management If Nuisance Occurs

As per internal procedure SOP 04 Corrective Action Procedure, on discovering an incident or non-conformance any staff on site is to:

- Notify the yard supervisors and/or facility manager and/or the environmental department and/or the health and safety department.
- The supervisor will immediately minimise the risk to human health, minimise contamination or pollution and mitigate the incident.

The Incident then is reported to the Environmental and Health and Safety Department immediately or as soon as is reasonably practical after the incident. The event should be investigated immediately or as soon as possible after the event has occurred. All

personnel involved and anyone who may have witnessed the event should be interviewed and statements documented. The scene of the event and equipment (if involved) should be photographed. A corrective action report (Document No. 4) must be completed ensuring all information on form is completed. The facility manager, environmental department and health and safety department should review the event's records and ensure that the corrective action has been completed if required to ensure a re-occurrence of the event is minimised.

Likely events that might create an odour nuisance are presented below. Also, measures to immediately tackle the situation to minimise impact.

- If determined that nuisance is caused by equipment malfunctioning maintenance team is to be contacted immediately and rectify issue.
- If litter, mud, material in yard, multi sweeper is to be used immediately and road sweeper organised as soon as possible. Also litter picking to be in progress at all times.
- All trailers incoming/outgoing are not to park in the yard and queues to be kept to the minimum. All loading, unloading, tipping of odorous materials are to only be loaded in the baling shed, not outside.
- Outside premises AG5 odour assessments are to be conducted as required to ensure no recurrence.

6 Conclusion

The odour levels on the facility are deemed to be acceptable, but in the event that odours do become an issue the appropriate mitigation measures have been identified in this Odour Management Plan which can be carried out to ensure it does not become a recurring problem.

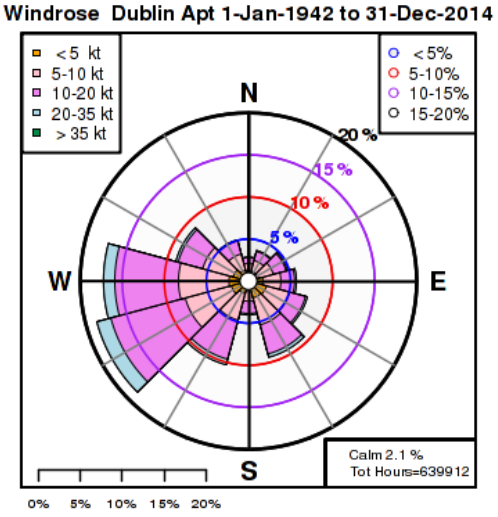
Appendix 1

Dublin airport windrose

Wind Direction

Wind blows most frequently from the south and west for open sites while winds from the northeast or north occur least often. In January the southerly and south-easterly winds are more prominent than in July, which has a high frequency of westerly winds. Easterly winds occur most often between February and May and are commonly accompanied by dry weather. The influence of topography can be seen in the low frequency of winds from a south easterly direction at Valentia Observatory, and winds from a southerly direction at Dublin Airport.

Click station to view data.



Appendix 2

Odour assessment map


XMusic
Dublin Harley-Davidson
An Post Parcel Depot
Ballymount Industrial Estate
Winthrop Engineering and Contracting
Parts4U
Western Parkway Business Centre
Home Store + More
Noyeks Newmans Kitchen Specialists
Auction Xchange
TileStyle
Fastway Couriers Dublin
Tile Merchant
Munster Joinery Dublin
Kellihers Electrical
Ballymount Civic Amenity Site
Virgin Media Television
Exertis
Pilsen Auto
UPS (United Parcel Services) Ireland Limited
Arco Safety
Creative Spa
Irish Nursing Homes
Snickers
ReCre
Google

Appendix 3

Daily inspection of boundaries and site

Panda
An Animal for Recycling

Daily Inspection of Boundaries & Site

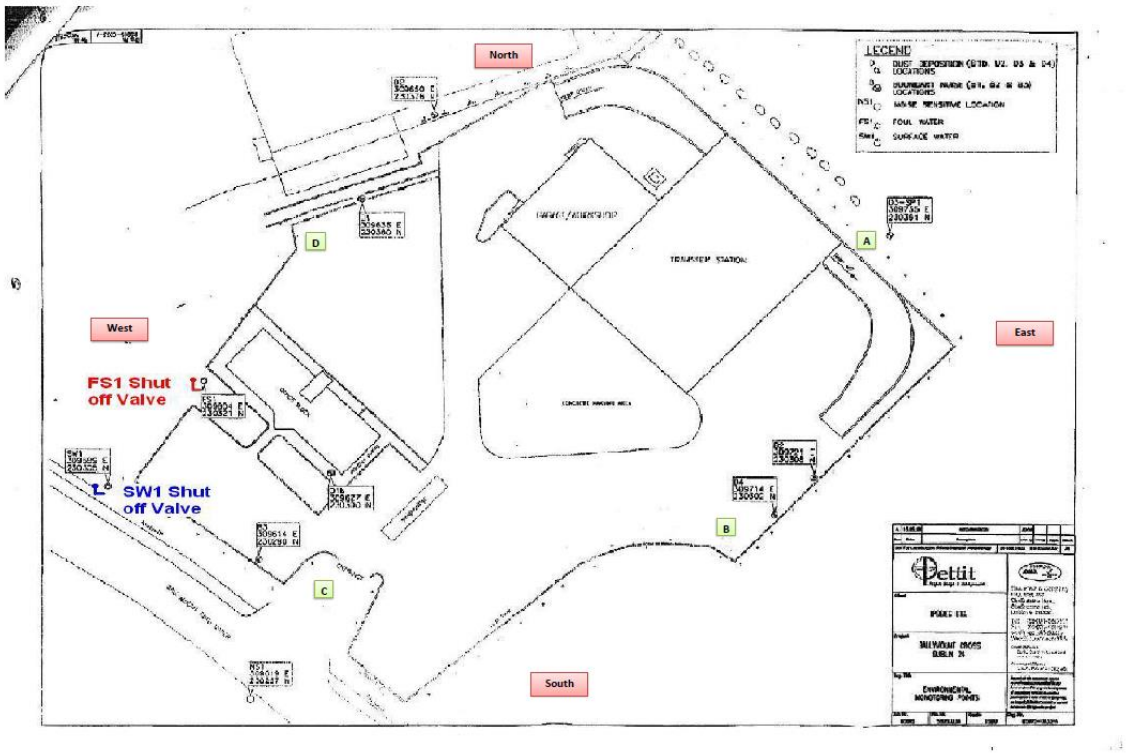
Panda Ballymount

Original in RED
EF 05
Issue 04
04.04.18

Date/Day						
Surrounding Areas & Yard	(A) NE	(B) SE	(C) SW	(D) NW	Observation	Corrective action
Drainage system						
Bunds						
Oil separators						
Noise						
Litter						
Vermin						
Birds						
Flies						
Dust						
Odour Scale (1 no odour-5 Pungent) Having regard for AG5						
Spill Kit						
Mud						
Vehicle truck wash						
Foul water						
Surface water						
Yard Clean						
Kerb						
Comments						
Directions	Please turn over for site map to identify observations.					

Signature	

Daily inspection Ballymount



Panda An Animal for Recycling	Odour Assessment Check sheet	EF16	Issue 01
		Issue date 05.01.2017	Page **1** of **1**

Date AM/PM	Wind Direction To	Wind Speed Km/h	Weather Conditions	Odour (Scale 1-5) 1 none - 5 pungent	Signature

APPENDIX 2.4

Emergency Response Plan

Emergency Response Plan
for

Starrus Eco Holdings Ltd
(Site Licence No. W0039-02)

Ballymount Industrial Estate,
Ballymount Road Upper,
Dublin 12.

Section 1.0 INTRODUCTION

This document is a site specific Emergency Plan for **Starrus Eco Holdings Ltd**, Ballymount Industrial Estate, Ballymount Road Upper, Dublin 12. It outlines the procedure to be followed in the event of an Emergency. It contains information on the site facilities, equipment, emergency systems, documents and procedures.

The Emergency Response Plan has been developed having regards for the agencies guidance note "Fire Safety at Non-Hazardous Waste Transfer Stations" which is included as Appendix 5 of this document.

Section 2.0 SITE INFORMATION

2.1 Description of Premises

The site is located in Ballymount Industrial Estate just off the M50, exit 10.

The site is operated in accordance with EPA licence W0039-02.

Refer to the site plan in Appendix 1 for site layout Plan and location of emergency systems.

2.1.1 Buildings

a) Main Process Buildings

There are two buildings on-site, which house the main waste segregation and transfer building and the weighbridge.

b) Surrounding Infrastructure

A weighbridge & office cabin is located at the main entrance to the site. A canteen and locker room are located on the north end of yard. The entire open yard area of the site is paved with concrete.

2.2 Access and Egress

Access and egress to the site is facilitated by the main entrance gates located at the front of the site.

Section 3.0: RISK ASSESSMENT METHODOLOGY

3.1 Analysis of the work area

An identification of safety hazards is developed from knowledge of the site, direct observation of site operations, review of audit reports, legal and regulatory requirements. The analysis is as realistic as possible.

All hazards identified are subject to the Risk Assessment process, which involves the following steps:

1. Identification of the hazard,
2. Identification of who may be harmed,
3. Identification of current control measures,
4. Assessment of risk (in terms of severity),
5. Identification of additional control measures,
6. Implementation of control measures and reduction of risk.

* The following scoring system is applied:

Risk Calculation: PE x FE x NP x MPL = Risk Category

Probability of Exposure (PE)		***Frequency of Exposure (FE)***		***Number of Persons Exposed (NP)***		***Maximum Probable Loss (MPL)***		***Risk Category***	
Very unlikely	0.5	Infrequently	0.1	1-2 persons	1	Fatality	15		
Unlikely	1	Annually	0.2	3-7	2	2Limbs/ eyes/	08		

				persons		serious condition		Low Risk	000 – 010
Possible	2	Monthly	1.0	8-15 persons	4	1Limb/ eye/ serious condition	04		
Even chance	5	Weekly	1.5	16-50 persons	8	Major Break/ minor illness	02		
Probable	08	Daily	2.5	>50 persons	12	Minor Break/ minor illness	01	Medium Risk	011 -50
Likely	10	Hourly	4.0			Laceration/ Mild ill health	0.5		
Certain	15	Constantly	5.0			Scratch/ Bruise	0.1	High Risk	>50

With the Hazard Risk Number (HRN) and the category of the risk, we can evaluate which hazard is the most critical. Dependent on the severity, appropriate mitigation will be applied in order to decrease the level of risk and decrease the HRN.

3.2 Review

The risk assessment will be reviewed:

- On an annual basis at least,
- As a result of the introduction of new operations, equipment &/or personnel,
- As a result of accidents, incidents or non-conformances,
- Changes in legislation, codes of practice or best practices.

3.3 Risks identified

All risk identified are stored in the Enviromanager ® risk assessment web based software.

3.4 Fire Water Risk Assessment

A Fire Water Risk Assessment Report was completed on behalf of Greenstar by O' Callaghan Moran & Associates at the request of the Agency. The purpose of the document is to review the site and its associated operations in order to identify the level of site compliance to pertinent regulations, codes and guidance and also to propose suitable risk reduction measures where deficiencies are identified. All recommendations were assessed and where possible these were implemented on site.

Section 4.0 RESPONSIBILITIES

An organogram is presented in Appendix 3 identifying key roles and responsibilities on this site.

4.1 Facility Manager

His/her main responsibilities include:

- To assess the suitability of the fire equipment in accordance with site requirements and activities.
- Review the suitability of the fire equipment annually.
- To ensure all new buildings have a valid fire certificate and take the necessary steps to revise and update this document when required.

- To ensure that necessary resources (material and time) are made available for the implementation of the Emergency Response Plan and the related training.

1. Risk assessment:
   - Ensure a Risk Assessment of the premises is carried out in relation to fire or other emergencies.
   - Update this document as required, but annually as a minimum.

2. Nominate persons with particular responsibilities (e.g. Fire Wardens) to be taken in emergency situations. Ensure that there is a Fire Warden responsible for all areas of the site.

3. Ensure that the required Fire Safety Training is carried out and that the Fire Wardens fully understand their duties.

4. Report to relevant Department (i.e. H&S and or Environment emergency situations) as soon as possible.

5. Together with the Fire Wardens, prepare an Emergency Evacuation Procedure (see section 6.0 of this document).

6. Ensure that all employees are fully aware of the Emergency Evacuation Procedure and that they can evacuate as quickly as possible in the event of an emergency.

7. Organise six monthly fire evacuation drills.

8. Keep a full record of:
   - All evacuation drills,
   - All responsible persons,
   - Fire safety training,
   - Records of fire equipment maintenance.

9. Receive reports from Fire Wardens on particular fire hazards and arrange for the removal of all fire hazards reported.

10. Keep Fire Wardens up to date on all matters affecting fire safety.

11. Select a more suitable assembly point in consultation with the Fire Wardens, if different than the one proposed in this document.

12. Ensure that fire evacuation notices and maps are complete and posted prominently throughout the building.

13. Ensure there is a sufficient number of Fire Wardens appointed.

14. Ensure that there is an effective audible means of raising the alarm in the event of an emergency.

15. Ensure that all fire-fighting equipment meets the required standards and that it is maintained and certified as required.

16. Ensure all emergency lighting meets the appropriate standard and that it is certified at the required intervals by a competent person.

17. Liaise with the local Emergency Services on an annual basis, notifying them of details of the Emergency Plan.

18. Coordinate Emergency Response and liaise with the Emergency Services Fire Officer on their arrival.

19. Ensure all Hazards (i.e. Gas, Chemicals etc.) which may pose a threat to the safety of the Emergency Services are identified.

20. Prepare the "Emergency Pack" for the Emergency Services (see section 5.0 of this document).

Following any emergency, there may be a requirement for further specialist assistance as recommended by the Emergency Service.

4.2 Fire Warden

1. Ensure all emergency signs are in position.

2. Ensure all corridors, passageways; fire escapes, escape routes and exits are unobstructed.

3. On a daily basis, ensure all fire doors are operable and emergency exit doors are unlocked.

4. Do a weekly check of all fire appliances to insure they are in the correct place and un-discharged.

5. On a daily basis be aware of the number of people within her/his area of control.

6. On hearing the fire alarm, ensure that all persons in her/his area are safely evacuated to their designated assembly point.

7. Conduct a roll call at the assembly point and report to the Facility Manager.

8. Inform the Facility Manager of any missing persons and give if possible an indication of their last location.

Section 5.0 EMERGENCY SERVICE SUPPORT

5.1 Emergency Pack

The **Fire Warden** will prepare an **Emergency Information Pack** and store it in the weighbridge for the Emergency Services. This pack contains:

1) An outline drawing of the premises showing exits and fire precautions.

2) Information on any special hazards (e.g. Flammable liquids, Chemicals, Gas etc.) and their location.

3) Location of dead man switch.

4) Location of fire hydrants.

5) Location of fire assembly points.

6) Location of shut-off valves

All this information is on the map in Appendix 1 of this document.

5.2 Escape Route Plan

A plan of the overall premises is displayed inside the main entrance(s) where it is visible to persons entering the building.

The plan clearly indicates the location escape routes, fire-fighting equipment, gas, electricity, the control panel for any fire detection or alarm system, installations such as fuel tanks, boiler houses and other areas of high fire risk.

A floor plan is displayed in a prominent position in each area indicating the nearest escape routes from where the plan is displayed. The location point is identified on the plan by the words "YOU ARE HERE".

A copy of the Plan is included in the Emergency Pack for the Officer in charge of the Emergency Services.

All plans are displayed on durable material, easily legible and of a suitable scale.

It is the responsibility of the Fire Warden to ensure that this plan is up-to-date, displayed in the appropriate locations and that revisions are communicated to the appropriate staff.

Section 6.0 EMERGENCY PROCEDURE

It is stipulated in the site waste licence (W0039-02) conditions, that if an emergency arises, measures should be taken to address the hazard and notify appropriate Authority (ies) and / or Agency (ies). To that extent, the **SEHL** EHS department should make contact ASAP but no later than 24H after the emergency arose.

6.1 Emergency definition

An emergency may constitute a fire, an explosion, a spillage, an unexpected hazardous or clinical waste or some of the above that would pose as a risk to human health and safety or to the environment. The previous sentence is not an exhaustive list.

6.2 Incident Investigation

1) Arrange to inspect the area where the incident occurred.
2) Inform the relevant **SEHL** department (Environment and / or HS) and seek advice for any other external communication.
3) Take statements from persons witnessing the incident.
4) Compile all the witness statements in a report.
5) Write a non-conformance report, if applicable.
6) Record the incident in an incident report form.

If applicable, the relevant Authorities will be informed of the incident and/or site closure as well as the reasons for it and corrective/preventive actions to be taken/required to resume normal business.

6.3 Scenario one: Fire

Follow the procedure below. The person discovering the fire should:

1) Immediately raise the alarm by giving verbal warning to those nearby or by operating the nearest break glass unit or using an air horn or using the internal radio system.

2) Contact your direct senior person who will escalate the information ASAP to the Fire Warden / Operations Manager or his/her deputy. At that stage, the Fire Warden will decide if the fire brigade should be summoned or not. If the fire brigade should be summoned, the Fire Warden might delegate the call to whoever is deemed competent to do so. This person will immediately contact the Emergency Services by dialling 112 or 999, requesting the fire brigade. He/she will provide the fire brigade with:
   - the address
   - the location of the premises
   - The phone number of the premises
   - And any other relevant information to hand as regards the fire and state of evacuation.

3) On hearing the warning of fire or the fire alarm, all the people in the concerned building should immediately leave by the nearest exit.
   Where possible close (but do not lock) doors and windows on your way out.
   Any Fire Warden should immediately commence their designated duties.
   The Fire Warden will retrieve the fire register and the emergency pack and proceed to the designated assembly point from where he will coordinate the emergency response plan.

4) The site administrative staff and the Operations Manager, if different, will join the Fire Warden to help coordinate the Emergency Response.

5) The Fire Wardens will evacuate their respective areas, do a roll call by team at the assembly point and report to the Facility Manager.

The assembly point is at the entry gates to the facility. If necessary, an intermediate assembly will be designated by the Fire Warden.

6) Fire Wardens must inform the Facility Manager of any missing persons and if possible their last known whereabouts.

7) The Fire Wardens liaise with the Emergency Services on arrival and, using the Emergency Pack, advise the Emergency Services Senior Fire Officer of any additional hazards (i.e. gas bottles, electricity, toxic chemicals, paints etc.)

8) When fire is out and cold, treats residual liquid contaminants as a spillage by using appropriate precautions as toxic/hazardous substances may be present. Appropriate measures are taken to dispose of substances as waste material in a safe and environmentally responsible manner.

No one can re-enter the building until the Fire Officer gives the all clear.

6.4 Scenario Two: Spillage Procedure

1. Raise the alarm and inform the Site Management as soon as possible.

2. If there is release of odour, fumes, smoke, gas or dust, evacuate to a safe distance. Stay upwind in such cases. Keep others away.

3. **If safe to do so**, use appropriate PPE and contain the spillage using spill containment material (Spill kits, absorbent material, drain covers etc). Place containment booms around the spillage if appropriate.

4. **Immediate priority is to prevent contamination of watercourses, surface water drains, and sensitive areas.**

5. Clean up the spillage into a suitable container. Arrange storage in a safe bunded location until appropriate disposal can be organised in accordance with current legal and regulatory requirements. This may involve the use of specialist licensed contractors to bring the material to a licensed facility.

6. Report the incident to the **SEHL** EHS department and relevant Authority (ies) and / or Agency (ies).

For small spills, (i.e. with diesel spills):

1. Use site absorbent material.
2. Collect up such absorbent material after use and store in a labelled container in designated bunded area to await disposal.
3. Dispose of it in accordance with the current waste Regulations.

6.5 Scenario Three: Handling hazardous and chemical waste

Different actions are taken depending on when the waste is discovered and the ease with which it can be identified.

1. If waste is identified whilst still in the lorry at the weighbridge, the lorry will be turned away at the weighbridge and sent to location of origin. The Waste Rejection Form (EF-06A) shall be completed.

2. If waste is discovered during tipping, the unacceptable waste should be re-loaded into the lorry that delivered it and the waste removed from site and sent back to location of origin. The Waste Rejection Form (EF-06A) shall be completed.

3. If a load of drums or containers with liquid within it is deposited on site:

    a. Machinery will remove as much of the contaminated material as is necessary.
    b. waste will be moved to the quarantine area (bunded or unbunded) depending on the nature of the material and dealt with appropriately.

6.6 Scenario Four: Waste rejection at final destination

1. Contact your **SEHL** dispatch depot. Give details of waste origin, reason for rejection, facility from which the waste was rejected.
2. **SEHL** offices will arrange an alternative appropriate facility to accept the waste.
3. Obtain a rejection note from the facility.
4. Transfer waste to appropriate facility.

6.7 Scenario Five: *Incident resulting in first aid requirements*

1) Contact first aiders ASAP; See Emergency Contact Numbers IF-15A.

2) Inform management (if not done via first aider himself or other colleague /witness of the Incident).

6.8 Containment plan for waste water after a fire event

1. Raise the alarm: inform the site management as soon as possible.

2. The majority of the firewater will be contained in an underground waste water storage tank located to the east of the weighbridge office. This system has no connection to the surface water system which discharges from the site. However as a precaution to guard against a situation where water may back up in the system and overflow to the system serving the building the shut off valve at the discharge point would be closed to contain all water within the site.

3. Our Tankering specialists, McBreen Environmental will be contacted and the firewater will be tankered off site to the nearest WWTP. McBreen Environmental have been contacted and have agreed to take firewater in the event of an emergency.

4. **Immediate priority is to prevent contamination of watercourses and sensitive areas.**

5. Report the incident to the SEHL EHS department and relevant Authority (ies) and / or Agency (ies).

Section 7.0 FIRE FIGHTING EQUIPMENT

7.1 Fire Extinguishers

Area Fire Warden checks fire extinguishers monthly.
Site management records the results of these monthly checks.
A competent person must inspect Fire Extinguishers annually, according to I.S. 291.
Site management records the results of these annual inspections.

7.2 Fire Hydrants

Fire hydrants must be tested annually to ensure the static pressure, the flow rate and the residual pressure are adequate according to BD 9999:2008.
These monitoring are recorded like any other inspection of the fire-fighting equipment.
See location on the site map in Appendix 1.

7.3 Fire Fighting

Life safety is the first priority in the event of a fire.
Fire-fighting is of lower priority until the life safety from fire of the occupants is assured.
A fire should be attacked immediately after the alarm is raised **only if it is safe to do so.**
Only a trained member of staff will attempt to tackle a fire. Such action should always be done with a buddy system in place.

Always keep your escape route clear; never let the fire get between you and your escape route.

If attempts to extinguish the fire cannot be continued without danger or if they are clearly failing to keep the fire in check, the fire fighter should **withdraw immediately**.

Small fires in SRF, timber, cardboard C&I or C&D may be tackled but only if it is safe to do so and then only by trained, experienced personnel.

Section 8.0 EMERGENCY PLAN REVIEW AND TESTING

8.1 Review

The Fire Wardens and a member of the EHS Department will review the Emergency Plan annually for adequacy.
The Emergency Plan is revised and updated as required.

8.2 Testing

An annual test is carried. Improvement opportunities and deficiencies arising from these tests are recorded and integrated into the Emergency Response Plan.

Evacuation drills will form part of the recorded testing process as detailed below:

- Evacuation times
- Operation and effectiveness of emergency systems
- Access and availability of equipment
- Emergency Contacts accuracy
- Training issues
- Communications
- Signage
- Site visitors response/control

Documented results of the test, together with improvement actions and the proposed timetable, will be communicated to the EHS Department for support and approval.

The emergency pack is stored in the weighbridge for communication with emergency services (Dublin Fire Brigade).

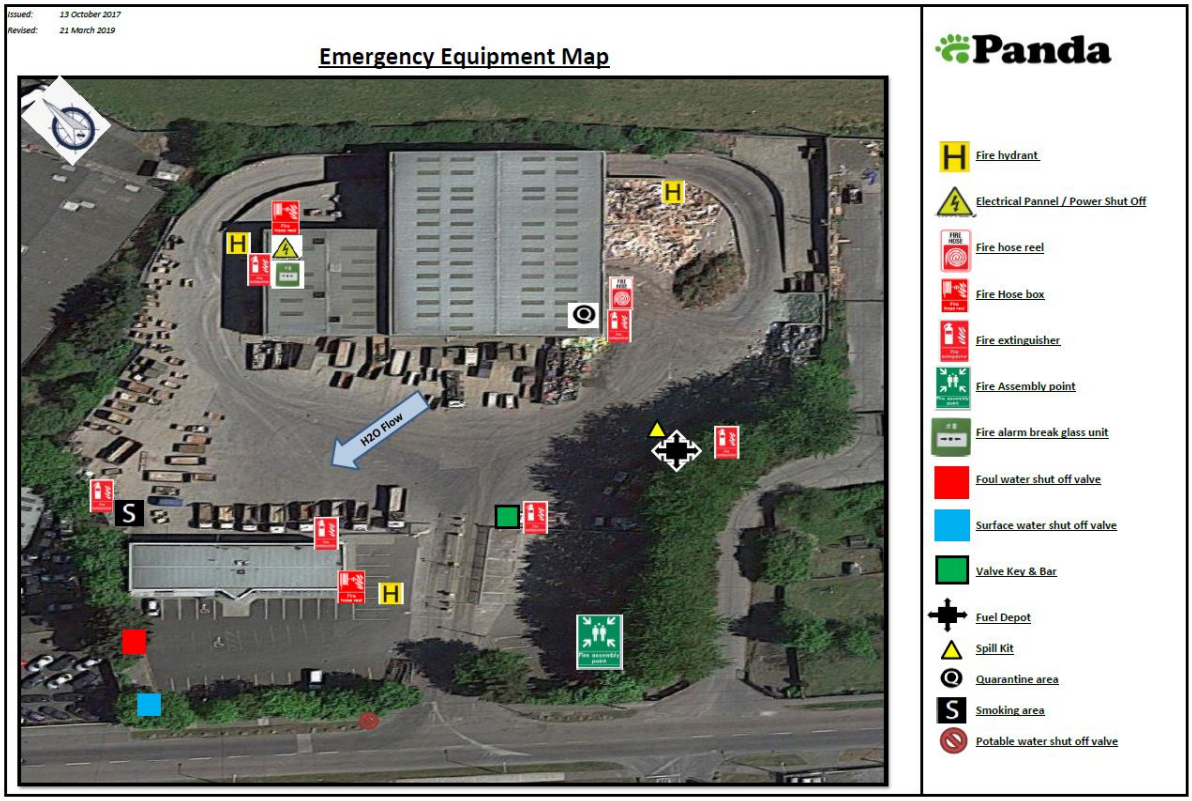
The Emergency Response Plan is communicated at each revision to the local Fire Brigade.

Section 9.0 POST FIRE ACTIONS

The site will remain evacuated until the fire has been fully extinguished and there is no risk of further fire development. This may take more than a day to achieve for a major fire.
All necessary measures will be taken to ensure that his building is safe to enter before staff may access any part of the site.
All fire-damaged waste will need to be characterised in order to determine suitable facilities for the recovery or disposal of the waste. Depending on the type of waste that was burnt and how badly damaged the waste is, characterisation may include the following:

- compositional analysis of the waste material;
- waste acceptance criteria testing for landfill;
- waste characterisation by visual sorting.

Appendix 1: Site map with emergency equipment



Appendix 2: Emergency contact numbers

External contacts

External Contracts – Please Refer to IF15-A – Emergency Contact List

Internal Contacts

Title	Name	Mobile	Location
Site Manager	Alex Scortanu	086 4104844	Veolia Ballymount
Group H&S Manager	Joe Nicholson	086 0226109	Ballymount
Head of Environmental affairs	David Naughton	086 6045904	Millennium Park
Environmental Officer	Devitha Venkatesh	086 1372927	Baling Station

Group Operations Manager	Kieran Connor	083 4044994	
Fire Warden	Alex Scortanu	086 4104844	Veolia Ballymount
Fire Warden	Lisa Keevan	087 3478363	Veolia Ballymount
First Aider	Lisa Keevan	087 3478363	Veolia Ballymount

Appendix 3: Company organogram

Refer to IF 06C – **SEHL** Veolia Ballymount Organogram

Appendix 4: EPA Guidance Fire at Non Hazardous Waste Transfer Stations.

Fire Safety at Non Hazardous Waste Trai

APPENDIX 2.5

Firewater Retention Plan

Unit 15
Melbourne Business Park
Model Farm Road
Cork

T: 021 434 5366
E: info@ocallaghanmoran.com
www.ocallaghanmoran.com

FIRE WATER RISK ASSESSMENT

WASTE RECYCLING FACILITY

BALLYMOUNT CROSS

TALLAGHT

DUBLIN 24

WASTE LICENCE NO. W0039-02

Prepared For: -

Nurendale,
Ballymount Cross,
Tallaght,
County Dublin

Prepared By: -

O' Callaghan Moran & Associates,
Unit 15,
Melbourne Business Park,
Model Farm Road
Cork

October 2017

Project	Fire Water Risk Assessment
Client	Nurendale

Report No	Date	Status	Prepared By	Reviewed By
15130020301	30/09/2016	Initial Draft	Neil Sandes BSc	Jim O'Callaghan MSc, CEnv, MCIWM, IEMA
	20/04/2017	Draft Rev A		
	26/10/2017	Final		
	10/11/2017	Final Rev A		

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1. INTRODUCTION

The Nurendale materials recovery facility at Ballymount is regulated by a Waste Licence (W0039-02) issued by the Environmental Protection Agency (EPA).

Condition 10.5 requires the licensee to carry out a risk assessment to determine if the activity should have a firewater retention facility. This assessment shall include an investigation into the provision of automatic/remote diversion of surface water to the retention facility. The assessment shall have regard to any guidelines issued by the Agency with regard to firewater retention.

Nurendale commissioned O'Callaghan Moran & Associates (OCM) to prepare a fire water risk assessment that includes the proposed redevelopment.

1.1 Methodology

The assessment followed the guidance in the Agency Draft Guidance Note to Industry on the Requirements for Fire-Water Retention Facilities and took into consideration Nurendale's direct experience of a fire at its facility in Beauparc in 2013 and the following:

- The Agency's Guidance Note; Fire Safety at Non Hazardous Waste Transfer Stations.
- The UK Environment Agency's Technical Guidance Note (TGN7.01) Reducing Risk at Sites Storing Combustible Materials, and
- The UK Waste Industry Safety & Health Forum Guidance Reducing Fire Risk at Waste Management Sites.

It included: -

- The identification of existing and potential hazards (evaluation of the materials and waste products typically stored on-site).
- A review of existing control measures, and
- An assessment of the hazards associated with: -
  i. The probability of an accident occurring,
  ii. Its impact both on-site and off-site (soil, water and air), and
  iii. The impact of an incident on sensitive receptors (residents, schools, businesses, hospitals etc).

2. FACILITY OVERVIEW

2.1 Facility Location & Surrounding Land Use

The facility is located on the southern end of Ballymount Industrial Estate, with relatively easy access to the M50. The land use surrounding the site is predominantly commercial and industrial, with some private residences within 250m of the site. The lot adjoining the northern boundary is an open field used for grazing. Further north is the Galco Steel Integrated Pollution Prevention Control (IPPC) licensed facility, which processes metals.

The lot to the west is occupied by a car sales outlet and further west is the Oxigen Environmental Waste Licensed MRF. The lots to the south of the Ballymount Road are occupied by commercial and industrial operations including T J O' Mahoney & Sons an IPPC licensed timber treatment facility. To the east is a logistics depot and furniture suppliers, with the South Dublin County Council Ballymount Waste Transfer Facility further east.

2.2 Facility Layout

The site encompasses approximately 1.18ha and the site infrastructure is shown in Table 2.1.

Table 2.1 Site Infrastructure

Ref	Infrastructure	Details
1	Office Block	Located in the south west of the site.
2	2 No Weighbridge	Located close to the facility entrance in the south of the site
3	Building 1	Waste Transfer – Processing of mixed and residual Municipal Solid Wastes.
4	Building 2	Recycling – Processing of Construction & Demolition Wastes and Timber.
9	Truck Wash and Hut	Located at eastern site boundary
10	Paved Yards	10,110m^2
11	Fuel Storage Bunds	31,800 litre diesel tank: 3,000 litre diesel tank
11	Timber Storage Bay	East of Waste Transfer Building
12	C&D Storage Bay	North of Fuel Bund

Building 1 and 2 are adjoining and essentially form one structure occupying an area of 1,692m^2.

2.3 Facility Activities

The facility is licensed to accept 150,000 tonnes of waste annually of municipal waste and commercial and industrial waste of similar composition to municipal waste. The wastes are delivered by Nurendale collection vehicles and by third parties, including permitted waste collectors and commercial waste producers. The facility does not accept waste from either members of the general public, or from waste contractors that do not have a contract with Nurendale.

The facility is primarily used as a transfer facility for skip waste from construction and demolition sites, household renovations/clearances and domestic and commercial & industrial mixed municipal waste, dry mixed recyclables and organic waste. No hazardous waste, putrescible waste or liquid wastes are accepted at the facility.

Ferrous, non-ferrous, wood and bulky waste are segregated from the incoming waste using a loading shovel and manually picked, and stored in the building for onward movement. The remaining mixed waste is then bulked up and sent to either PANDA's Beauparc facility for processing or to other appropriately authorised recovery/disposal facilities.

Operations require the use of a range of fixed and mobile plant which are listed in Table 2.2.

Table 2.2 Plant and Equipment

Type of Plant	No.
Loading shovel	1
Track Machine	1
Forklift	1

2.4 Services

The facility obtains water from the municipal water supply system provided by South Dublin County Council. There is an electricity power supply provided by Electric Ireland. Sanitary wastewater discharges to the South Dublin Council municipal foul sewer. There is a manually operated shut off valve that can be used to stop the discharge to the sewer in the event of an incident that has the potential to release pollutants to the sewer.

2.5 Drainage System

The facility is located approximately 400m to the south of an unnamed stream, which is a tributary of the Cammock River. The Cammock River discharges into the River Liffey at Huston Station in Dublin City Centre.

Rainwater run-off from the roofs and majority of the paved yards is discharged to the municipal storm sewer via a grit trap and oil interceptor. Sanitary waste water and rainwater run-off from the open yards in the vicinity of the truck wash, oil storage tanks and the Transfer Building ramp is discharged to foul sewer via interceptors. There are manually operated shut off valves that can be closed to stop the discharge to the municipal storm and foul sewers in the event of an emergency.

2.6 Hydrology

The facility is located approximately 400m to the south of an unnamed stream, which is a tributary of the Cammock River. The Cammock River discharges into the River Liffey at Heuston Station.

2.7 Geology & Hydrogeology

The site is underlain by made ground, which is likely underlain by Limestone Till that ranges in thickness from less than 3m in the south site to 10m or more in the north. The underlying bedrock is part of the Calp Limestone Formation, which comprises dark grey to black limestone and shale.

The available information indicates that the subsoils are not significantly water bearing. The bedrock aquifer beneath the site is classified by the GSI as a locally important aquifer, which is only moderately productive in local zones (Ll). The aquifer vulnerability ranged from High to Low in the northern part of the site to Extreme in the south.

Based on the topography the local direction of groundwater flow is considered to be towards the unnamed stream to north of the site. There are no on site groundwater wells. The closest recorded down gradient well is approximately 1.2km to the north of the site.

3. OPERATIONAL AREA

3.1 Open Area

The site occupies 11,800m^2 and is almost entirely covered by buildings and paving. The car parks in the south of the site are paved with bitumen, while the operational yard between the office and the processing buildings is paved with concrete. There is a strip of unpaved ground along the northern boundary, between the processing buildings and the security fence. There is a landscaped area along the western side of the car park to the south of the office

Staff vehicles are parked in the southern part of the site, to the east and west of the site entrance. Refuse collection vehicles are parked to the north of the offices. Empty skips and empty bins are stored adjacent to the southern and western side of the processing buildings.

There is a perimeter kerb along the western, northern and eastern operational yards and around the staff car parks. In addition there are concrete waste storage bay along the eastern boundary.

3.2 Processing Buildings

Buildings 1 and 2 are adjoining and essentially form one structure occupying an area of 1,692m^2. There is a paved loading ramp at the northern end of the buildings. Ferrous, non-ferrous, wood and bulky waste are segregated from the incoming waste using a loading shovel and manually picked, and stored in the building for onward movement. The remaining mixed waste is then bulked up and sent for further processing or disposal.

3.3 Oil & Chemical Storage Areas

The only hazardous material is diesel and gas oil. The Nurendale collection vehicles are refuelled on site from a 30,000 litre steel tank that is located in a concrete bund area at the eastern site boundary. The mobile plant is refuelled from a separate tank located in a concrete bund to the south of and adjoining the main tank. The dispensing units for both tanks are located inside the bunds.

Engine oil and hydraulic oil are stored on bunded pallets in the maintenance hut on the western boundary. Odour neutraliser and detergents used to wash the vehicles/bins are stored on bunded pallets inside the power-wash house on the eastern site boundary. An AdBlue additive dispenser for the trucks is located in a purpose built unit adjacent to the fuel depot. The odour neutraliser dosing unit is also located in the quarantine area. The maximum volume of consumables stored on site at any one time is in Table 3.1

Table 3.1 – Volume of Hazardous Materials

Products	Quantity Stored litres
Diesel Oil	31,800
Gas Oil	3,000

4. FIRE CHARACTERISTICS OF PRODUCTS ON-SITE

4.1 Materials Classification

The maximum amount of waste on site at any one time, which has been agreed with the Agency for the purposes of the Decommissioning Management Plan, is 801 tonnes, which is broken down in Table 4.1

Table 4.1 Wastes on Site

Tonnes	Waste Description
100	Mixed C&D
50	Waste for landfill
200	MMW
75	Organics
1	Batteries
40	Metal
75	Dry waste
10	Plasterboard
2	Weee
30	MDF
50	Soil & Stones
10	Hard Plastic
40	Green waste
100	Timber
5	Non Ferrous metals
2	Tyres
1	Cylinders
10	DMR
25	Glass

The majority of the waste are combustible but are neither particularly flammable nor harmful to the environment.

The only hazardous materials currently used are the diesel and gas oil. The maximum amounts on site at any one time are in Table 4.2

Table 4.2 – Volume of Hazardous Materials

Products	Quantity Stored litres
Diesel	20,000
Gas Oil	5,000

The materials were classified using the Hazard Statements derived from the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Table 4.2 - Risk Phrase & Chemical Hazard

Material	Hazard Description	CAS No	Hazard Statement
Diesel	May cause cancer	Mixture	H351
	Toxic to aquatic life with long-lasting effects.	68334-30-5	H411
Gas Oil	May cause cancer	Mixture	H351
	Toxic to aquatic life with long-lasting effects.	68334-30-5	H411

5. FIRE SAFETY MANAGEMENT SYSTEM

5.1 Fire Fighting Management System

The safety management system comprises:

- Fire prevention
- Fire detection
- Fire response
- Fire suppression

As is the case at all Nurendale facilities staff are trained in fire prevention and detection.

5.2 Fire Prevention Measures

5.2.1 Storage of Combustible and Flammable Materials

The following principles are applied to the storage of combustible materials and flammable liquids.

- Good housekeeping and prompt transfer of wastes to prevent the build-up of combustible materials.

- The method of storage is generally consistent with the recommendations in Appendix 1 of 'Reducing Fire Risk at Waste Management Sites' (Waste Industry Safety and Health Forum 2014) and is based on the site characteristics which are described in this Section.

- Regular inspection of plant and equipment for leaks and damage to prevent spillage of flammable liquids.

  Removal of any gas containers or unidentified liquids/chemicals from the off-loading areas to the quarantine area immediately such items are noticed.

- Plant clean down at end of each shift to ensuring no material could be ignited by hot plant.

5.2.2 Control of Sources of Ignition

The potential sources of ignition at the facility include:

- arson/vandalism:

- naked flames/smoking:

- electrical faults/heating faults/equipment failures:

- self-heating of waste that has been stockpiled for too long:

The controls measures applied to minimise ignition sources include:

- Security fencing and CCTV system to prevent unauthorised entry
- No portable heaters are used on site. Smoking is only to be authorised in a single specified designated area, which will be away from the operational and waste storage areas.
- Intake stock and processed are rotated to ensure there is no heating in stock piles.
- Minimising the amount of combustible waste stockpiled at the facility.

5.3 Fire Detection

All waste loads received at the site are off loaded inside the buildings and initially checked by the yard supervisor as they are tipped to ensure they are not on fire. Site staff will alert other staff members in the event of a fire, and there is a full time manned security presence outside of the operational hours.

5.4 Fire Response

The Facility Manager is responsible for the identification and provision of training for all relevant employees in

• Fire control
• Fire Protection Equipment Handling
• First Aid
• Evacuation Control

The responsibilities are detailed in the Emergency and Response Procedure, a copy of which is in Appendix 1. The procedure does not refer to closing the shut-off valves on the storm and foul water sewers in response to the fire alarm.

5.5 Fire Suppression

At least two of the facility staff on site at any time will have fire marshal training. This is a more advanced level of firefighting training than is normally required. They will also be trained in the correct use of stand pipes and hoses.

The volume of water varies depending on number of tenders or tankers. Normally approximately 6 fire tenders with 1.82m^3 capacity each are dispatched to an incident at a facility such as this. Additional fire-fighting water would be obtained from the main supply.

6. RISK ASSESSMENT

Risk Assessment is defined in the Draft Guidelines as '*an assessment of the risk that an industrial facility poses to the environment during a fire that brings fire-water into contact with operations or substances that would cause significant pollution'*. Contaminated fire-water is defined as '*water that has become contaminated with process materials used at a facility and the products resulting from combustion'*.

The review of site operations identified one discrete drainage area for risk assessment purposes. This comprises the paved yard which is served by one drainage system. Firewater run-off generated in a response to a fire in all of the operational and administrative areas will run-off onto the yard.

6.1 Fire Risk Criteria

The fire risk criteria are:

- Risk of ignition
- Risk of non-detection
- Risk of failure to extinguish correctly/quickly

The risk of ignition is lowest where there are no flammable or highly flammable materials, such as liquids or gases present, or where they are present only in small quantities.

The risk of non-detection is highest in an area that is unoccupied/unmonitored for a prolonged period of time and when there is no automated fire detection system.

The risk of failure to extinguish a fire quickly and fully is dependent on quick detection and appropriate fire extinguishing techniques. If detected promptly and the appropriate corrective action taken, then the fire risk is considered to be Low. If a fire is not likely to be detected quickly, the fire risk is considered to be Medium. The Fire Risk Categories used in this assessment are set out in Table 6.1.

Table 6.1: Fire Risk Categories

Low Risk	Where fire is an unlikely risk
Medium Risk	Where fire is a possible risk
High Risk	Where a fire has feasible potential

The Fire Risk is Medium. The sources of ignition are limited due to the nature of the waste processing. The most significant risk is associated with the stockpiled wastes and plant used

inside the buildings. There is a lesser risk of a fire occurring in the external diesel tank bund and the offices.

6.2 Potential Fire Load Criteria

The potential fire load is determined by the type of combustible materials present and the likely rate of combustion. The criteria used in this assessment are set out in Table 6.2.

Table 6.2 Fire Load Criteria

Low Load	Quantities of poorly combustible material
Medium Load	Significant quantities of combustible materials
High load	Substantial quantity of combustible materials or large quantity of flammable liquids

The potential Fire Load is Medium due to quantity and types of the waste and materials stored. The maximum amount of waste on-site at any one time is 801 tonnes, of which approximately 18% is non-combustible (soil and stones, rubble, plasterboard, insulation and metals).

6.3 Environmental Load

The environmental load is an assessment of the likelihood of environmental impacts to surrounding soils, air, surface and groundwater. The severity of the impacts depends on the characteristics and quantities of materials on-site at the time of a fire that have the potential for significant degradation of the receiving environmental media. The main assessment criteria include:

- BOD
- Acute toxicity effects
- Persistence of the pollutant
- Risk of bio-accumulation

The Environmental Load Criteria are set out in Table 6.3.

Table 6.3 Environmental Load Criteria

Low Load	Minor potential for degradation of receiving air/soil/water
Medium Load	Potential for minor degradation and/or long term effects to receiving soils/waters
High Load	Potential for major degradation and long term effects to receiving air/soil/water

The potential environmental load is Medium. The volume of materials on site with hazard statement H411 is low. While contaminated firewater escaping from the site has the potential to contain ecotoxic substances from the combustion of plastics that have the potential to degrade the soil on the neighbouring properties and the Cammock River, the impacts will be transitory, with no long term effects.

6.4 Environmental Risk Criteria

The assessment of the environmental risk presented by a fire is based on a combination of the risk and extent of a fire, the environmental load and the area at risk. The latter includes:

- The extent of air/soil/water polluted
- Use of receiving air/soil/water (crop production, potable water, livestock, water irrigation, fishing, wetlands/wildlife habitat or public amenity use)

The Environmental Risk Criteria used in this assessment are presented in Table 6.4.

Table 6.4 Environmental Risk Criteria

Low Risk	Not a significant risk, protective measures may be required in the long term
Medium Risk	Discernible risk, where proactive remedial works or protective works may be required
High Risk	Extremely hazardous risk of significant environmental degradation and preventative action is required immediately

The overall environmental risk associated with a fire is considered Medium.

6.5 Volumes of Firewater

The likely firewater volume arising due to a fire is shown in Table 6.5. The Draft Guidance assumes a fire will last 45 minutes; however recent experience indicates that a fire can last for much longer than this. For the purpose of this assessment, it has been assumed that firefighting will continue for 4 hours. This is based on the type and quantities of waste on site at any one time and the existing detection and suppression systems.

The Draft Guidance requires consideration of a significant rainfall event on the day of the fire. The Draft Guidance specifies a rainfall event of at least 50mm over the entire area served by the surface water drainage system. The volume of water generated by a rainfall event of this magnitude is 590m^3 (area served by drainage system 11,800m^2 x 0.05m).

There is a perimeter kerb along the western, northern and eastern operational yards and around the staff car parks, which assuming an average height of 30mm, provides a retention capacity of 350m^3. The storage capacity in the storm water and foul water drains, assuming the shut-off valves are closed, is 10m^3. The estimated retention capacity in the loading ramp inside the building is (6mWx50mLx2mD)610 m^3

Table 6.5 – Building

Parameter	Calculation	
Total Site Area	11,800	m^2
Containment (Loading Ramp)	610	m^3
Kerbed Yard	350	m^3
Foul and Storm Sewer	10	
Available Containment	**970**	**m^3**
Duration of Fire	4	hours
Water from Fire Service Tenders (6x1.8m^3)	10.8	m^3
Water delivered by Fire Service from mains (50l/s)	720	m^3
Firewater (m^3)**	731	m^3
Potential Rainfall - 0.05m (30yr event) x 11,800m^2 x 1 (Paved 100%)[3]	590	m^3
Total To be Contained	**1321**	**m^3**

**It is assumed that all of the water used to suppress the fire runs-off and none is evaporated and that none infiltrates to ground in the unpaved area

6.6 Source-Pathway-Receptor Risk Assessment

Risk assessment uses a systematic and progressive approach to identifying risks, with the aim of establishing a pollutant linkage from a hazard via a pathway to a receptor. If a pathway does not exist linking the hazard to a receptor, then the risk is absent.

The pathways by which contaminated firewater can migrate from the site are

- Surface water drainage system,
- Infiltration to ground in unpaved areas and damaged paving,
- Overland flow across site boundary

The potential receptors are:-

- Surface Water Body (Cammock),
- Groundwater Aquifer
- Neighbouring private industrial/commercial premises

6.7 Retention Requirement

The available retention capacity (970m^3) is then the estimated volume of the combined firewater and rainwater run-off (1,321m^3). However, as it is highly unlikely that a fire will occur at the same time as a 50mm rain fall event and in this context there is no need to provide additional retention capacity.

7. CONCLUSIONS

7.1 Conclusions

- A fire duration of 4 hours is estimated based on the current detection and suppression system and the types and volumes of waste on site at any one time. The volume of firewater generated by an incident of this duration would be 731m^3.

- The current available retention capacity is 970m^3. While this is less than the combined run-off generated during a fire that happens at the same time as a 50mm rainfall event, the likelihood of such an occurrence is rare and in this context additional retention capacity is not required.

- The current ERP does not refer to

    - the EPA's Guidance Note On Fire Safety At Non-Hazardous Waste Transfer Stations.

7.2 Recommendations

- It is recommended that the perimeter kerb be subject to regular inspection and repair as required and records of the inspections maintained.

- It is recommended that the ERP be updated to take into consideration the relevant guidance on Fire Response Plans in Section 6 of the EPA's Guidance Note On Fire Safety At Non-Hazardous Waste Transfer Stations.

APPENDIX 1

1.0 Purpose:

The purpose of this ERP is to provide an emergency response method for dealing with emergencies in a safe and environmentally friendly manner.

2.0 Responsibilities

2.1 Emergency response team

- Brian McCabe Director
- David Boyd Facility Manager
- David Naughton Environmental Manager
- Denis O'Sullivan Health and Safety Manager
- Mark Andrews Yard Supervisor

The director has overall responsibility for this procedure.

The environmental department are responsible for ensuring that all relevant personnel are adequately trained in this procedure.

Employees trained in this procedure are responsible for complying with the requirements of the ERP and are responsible for ensuring that they can adequately respond to any emergency that may arise.

All managers and drivers are responsible for ensuring that vehicles and trailers/skips are maintained in a roadworthy condition at all times.

3.0 **Definitions**

3.1 Emergency: For the purposes of this procedure an emergency shall constitute

- Spillage
- Fire/explosion
- Anything that might result in environmental pollution
- ERT Emergency Response Team
- Personal (approximately 8 yard staff and 50 office staff)

4.0 Procedure

4.1 Should an emergency situation arise, the facility manager, Environmental Manager and health and safety manager or any other designated person will implement the ERP.

4.2 The environmental manager will review the ERP each year. Additional procedures will be included in the ERP as necessary

4.3 Details of all emergencies will be documented and records maintained on the site. The response to the emergency and the likely impact of the emergency on the environment will also be documented.

4.4 Following a complete investigation into each emergency a corrective and preventative action procedure will be implemented

5.0 Possible emergencies that may arise at Panda Waste Services

5.1 Definitions

Spill	Any amount of liquid
Small spill	less than five litres
Medium spill	five litres to two hundred and fifty litres
Large spill	greater than two hundred and fifty litres

Responsibilities
The yard supervisor, as the initial person at the scene, is responsible for dealing with all spills that occur on the site. He is also responsible for informing the environmental manager or other responsible person as soon as possible.

5.2 Waste spill

Actions to be taken on occurrence of a non-hazardous spill

- Non-hazardous spills will be cleared immediately into the fowl drainage system.
- The spill will be reported to the environmental manager, who will record all details of the spill. If a liquid spill occurs, the shut off valve will be shut off immediately at SW1 and FS1 (Location drawing below).

Actions to be taken on occurrence of a hazardous spill

- Ensure only competent persons wearing suitable protective clothing handle the hazardous materials
- Ensure appropriate equipment is used for handling the material.
- Evacuate the area, if necessary, and contact the emergency services
- Contain the spill using absorbent materials, which are located around the site, and from the environmental department.
- Emergency shut off valves should be closed if the spill enters the drainage system. As indicated in drawing below.
- Once a spill has been contained, inform the environmental manager
- The environmental officer will determine the source and nature of the spilled material and obtain a material safety data sheet, where possible.
- In the event that surface water is contaminated, the environmental manager will immediately inform South Dublin County Council and the EPA.
- In the event that foulwater is contaminated, the environmental manager will consult the relevant Wastewater Treatment Plant and the EPA prior to tankering it off site.
- In the event that the spill is likely to have caused environmental pollution, the spill will be considered as 'an incident' under condition 9.3 of the waste licence and will be treated as outlined in condition 11.1

5.3 Equipment Breakdown

List of equipment Deemed critical for the normal operation of the plant

1. Transportation fleet
2. Weigh-bridge

3. Tracking machine, used to sort incoming waste
4. Loading shovels
5. Forklift

Responsibilities

Transportation fleet: all drivers are responsible for their own lorries.
Weigh-bridge: the facility manager is responsible for the weigh-bridge
All other equipment: the yard manager is responsible for all other equipment

Actions to be taken in the event of equipment or machinery breakdown

- There is sufficient fleet to allow the continuation of normal operations in the event of a breakdown of any of the lorries.
- The loading shovels are sufficient to cover the breakdown of the tracking machines and vice versa
- The facility manager will be immediately notified when a problem occurs with any equipment or machinery and will arrange for the equipment to be fixed by the fleet maintenance team.
- In the event that the weighbridge breaks down, an alternative weighbridge will be used.

5.4 ***Incidents as described in our licence condition 9.3***

- In the event that an incident, as outlined in condition 9.3 occurs, we shall comply with the requirements of the licence
- The deputy facility manager will perform the duties of the facility manager in the absence of the facility manager.

5.5 Fire Fighting Response

Fire safety management at the facility is comprised of the following:

- Fire prevention
- Fire containment
- Fire detection
- Fire suppression
- Response in event of fire
- Response in event of an alarm

5.6 Fire Prevention

Fire Prevention is achieved by:

- Safe storage of combustible and flammable materials
- Prevention of mobile sources of ignition in areas with combustible and flammable materials
- Suitable equipment
- Hot work permits will be introduced for proposed welding operations
- Good housekeeping
- Regular maintenance and competent repair of equipment
- Efficient emergency response and communications plan

- Regular safety audits

5.7 Storage of Combustible and Flammable Materials

The following are the combustible materials and flammable liquids stored on site;

- Gas Cylinders (50 bottles)
- C&I Lights (100 tonnes Approx)
- MSW (50 tonnes Approx)
- Wood (150 tonnes Approx)

The following principals are applied to the storage of the following combustible materials and flammable liquids

- Good housekeeping and prompt consignment of dry recyclables off the site to prevent the build up of combustible materials
- Regular inspection of plant and equipment for leaks and other miscellaneous problems to prevent spillage of flammable liquids
- Removal of any gas containers or unidentified liquids/chemicals from the off-loading areas to the quarantine area immediately such items are noticed
- Provision of adequate bunds around the diesel and gas oil storage tanks.

5.8 Control of Sources of Ignition

The controls measures applied to minimise ignition sources include:

- No smoking policy within the Licence area unless in designated smoking area
- Hot work permit system
- Only authorised personnel are permitted within the waste handlings areas
- Secure site access and 24 hour site security to prevent unauthorised entry

5.9 Fire Detection

The fire detection system/alarm at the facility consists of the following:

- Site staff will immediately cease operations and vacate buildings and assemble at designated points
- Site staff or security officer will alert the Emergency Response Team (ERT) in the event of a fire,
- Shut off valves to foul and surface drains should be closed immediately.
- The Facility Manager and Environmental Manager are the designated Site Incident Controllers, with responsibility for assessing the scale of an incident, informing fire service, directing localised rescue and fire abatement services. If an incident occurs outside normal operating hours, the security staff will contact the relevant authorities

- The local Fire and Rescue Services will be contacted by the ERT or security officer if necessary, the ERT will remain present to assist the Fire and Rescue Services as required.

5.11 Fire Suppression

- The fire suppression capability is a combination of on site - fire fighting equipment and emergency response plans, and off site – fire service.
- If a fire occurs, the out flow pipe from the water drainage system, shall be shut off immediately at the shut off valves, located at SW1, FS1 (Location drawing below).

5.12 On Site Fire Suppression Facilities

The on site fire abatement equipment includes:

- Fire Extinguishers (15 No) strategically located throughout with signage
- Hose reels at shed doorways

The fire water storage tank is supplied from an onsite groundwater well. As water is drawn down from the tank, it is automatically replenished by pumping from the well.

5.13 Off Site Fire Suppression Facilities

South Dublin County Council Fire Service can bring water to site. The volume of water varies depending on number of tenders or tankers.

5.14 Anything that might result in environmental pollution

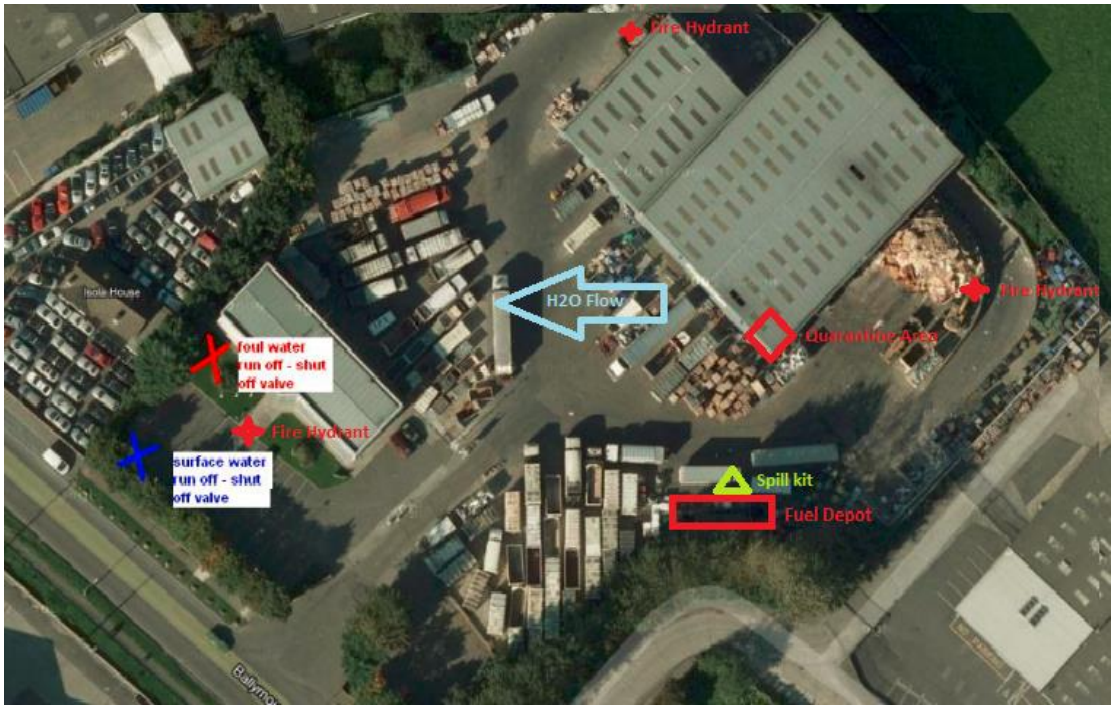
If it is suspected that environmental pollution is being caused as a result of waste transportation

- Stop what is being done immediately and
- Notify the environmental Officer at Panda (Ph. No. 1850 65 65 65).
- The environmental officer will notify the relevant regulatory authorities if necessary.

6 Useful numbers

Brian McCabe (Director)	087 9978422
David Boyd (Facility Manager)	087 926 3909
Peter Waters (Tanker Dept)	086 8386979
David Naughton (Environmental Manager)	086 6045905
Denis O'Sullivan (Health and Safety Manager)	086 4133531
Mark Andrews (Yard Supervisor)	086 0221018
South Dublin County Council	046-9021581
EPA Wexford	053 9160600
EPA Dublin	01 2680100
H.S.A.	1890 289 389
Central Fisheries Board	01-8842600
Emergency Services	**999**

Location of Surface Water ((SW1) – Red), and Foul Water ((FS1) – Blue) shut off valves



APPENDIX 3.1

Engineering Report

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2023

Civil Engineering Planning Report

Civil Engineering Planning Report
Proposed Waste Processing Facility, Ballymount

Document Control Sheet

Client:	Starrus Eco Holdings Ltd
Document No:	221244-ORS-XX-XX-RP-C-13a-001

Revision	Status	Author:	Reviewed by:	Approved By:	Issue Date
P01	S2	KM	AK	MH	01/11/2023
P02	S2	KM	AK	MH	27/11/2023

ORS

Contents

ORS

1. Introduction

This report outlines the Civil Engineering deliverables completed for the planning application for a proposed waste processing facility development and associated site works at Ballymount, Co. Dublin. The development will comprise of:

a) demolition of the existing processing sheds and offices;

b) relocation of the weighbridges;

c) construction of a single 4,710m^2 industrial building for all waste processing operations, complete with staff welfare facilities and a small site office;

d) sustainability features will include fire detection and extinguishing system, roof-mounted solar panels, LED lighting inside and outside, rainwater harvesting and permeable paving under the carpark.

A general outline of the proposed works is provided in Figure 1.1 below.

Figure 1.1 – Proposed Site Layout

2. Design Codes & Standards

The civil engineering works presented in this report and the accompanying drawings have been designed in accordance with the following codes of practice and standards:

- “Irish Building Regulations Technical Guidance Documents” Department of the Environment and Local Government
- “Greater Dublin Strategic Drainage Study” published under the National Development Plan
- CIRIA Report “C697 – Sustainable Drainage Systems”
- EPA - Wastewater Treatment Manuals – Treatment Systems for Small Communities, Business, Leisure Centres and Hotels
- EPA – Guidance on the Authorisation of Discharges to Groundwater (EPA, 2011)
- EPA – Groundwater Protection Responses for On-site Wastewater Systems for Single Houses
- European Communities Environmental Objectives (Surface Water) Regulations, 2009
- Irish Water Water Code of Practice
- Irish Water Wastewater Code of Practice
- Design Manual for Urban Roads and Streets

3. Site Location and Description

The site is currently an existing Materials Recovery Facility (MRF) in Ballymount with a total site area of circa 1.18ha. The site is located in Ballymount Little, to the east of M50 and to the south of Naas Road R110. Access is provided off the Ballymount Road Upper which bounds the site from the southwest. The site is bounded by existing industrial estates to the south and northwest. There is an agricultural land on which construction of a residential development is proposed, to the east of the site. The location of the site is shown in Figure 3.1 below.

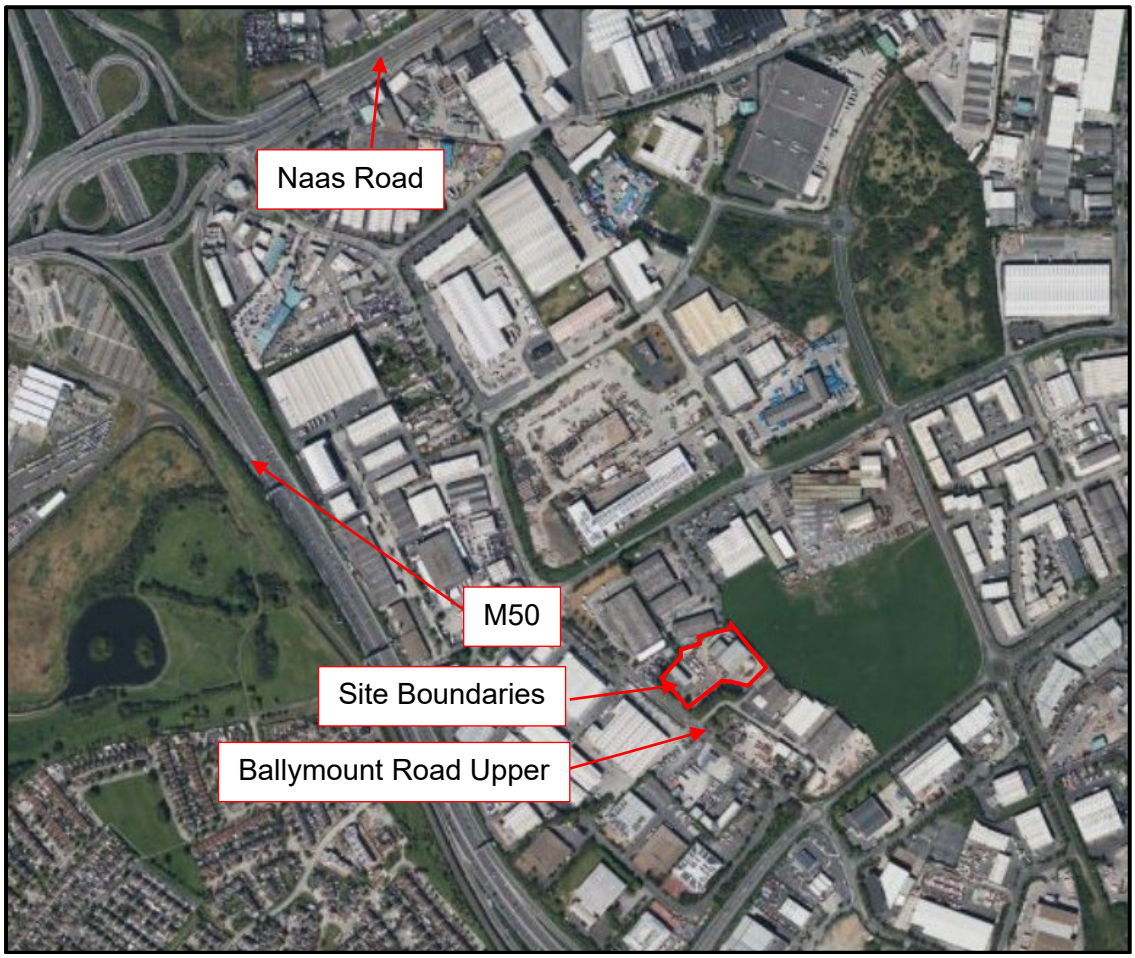


Figure 3.1 – Site Location and Extents (Source: Bing Maps)

There are two adjoining waste processing buildings in the north of the site, with an office block in the southwest. There are 2 weighbridges at the entrance, with car parking to the east and west, see Figure 3.2.

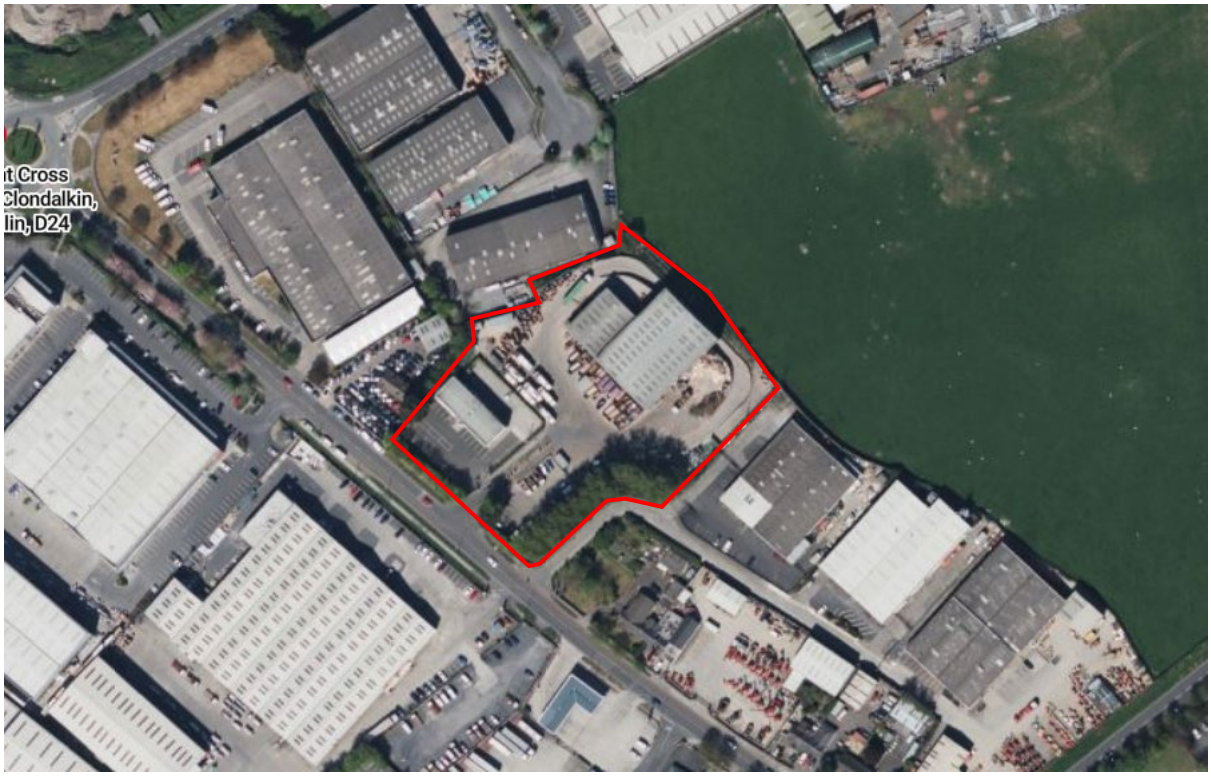


Figure 3.2 – Existing Site Layout (Source: Bing Maps)

The development will include the demolition of the existing processing sheds and offices and the expansion of waste processing operations on the site into a single building. A single 4,710m^2 industrial building will be built on the site, complete with staff welfare facilities and a small site office and weighbridge. All waste processing will be carried out inside the building which will be equipped with negative air extraction, dust and odour control units, modern fire detection and extinguishing system, 500kW of roof mounted solar panels, rainwater harvesting, and LED lighting inside and outside. It is proposed to use permeable paving under the carpark.

3.1 Site Topography

The subject site is generally flat. It slopes gradually from southeast to northwest from approximately 64.95m OD in the southeast to 63.495m OD in the northwest.

4. Water and Wastewater Services

4.1 Irish Water Correspondence

A pre-connection enquiry was lodged with Irish Water in November 2023 for both water and wastewater. The email containing the Pre-Connection Enquiry Ref Number CDS23008187 is attached in Appendix A.
A confirmation of feasibility (COF) is still to be received from Irish Water.

Existing water, wastewater and surface water infrastructure maps in the locality of the site have been sourced from the public infrastructure maps available in QGIS software and from South Dublin County Council, and are attached in **Appendix B**.

4.2 Water Supply

The proposed development will connect to the existing watermain located to the southeast on Ballymount Road Upper.

The anticipated water demand for the development has been calculated in accordance with Irish Water – Code of Practice for Water Infrastructure. Given that the proposal is for an industrial development without canteen, the water usage per person has been taken as 50 litres per day for staff, 2No. shifts per day with 10No. operatives in each. It is expected to have approx. 150 visitors (delivery drivers) a day, using 10 l/day/ person (conservative). As calculated in **Appendix C** for the industrial units.

The watermain shall have a minimum cover of 900mm and shall be overlain with tape containing a tracer wire. The watermain shall also be located a minimum of 3m away from any structure as per Irish Water Code of Practice requirements. Air valves to BS5159 and sluice valves to BS5163 where required shall be installed on site. Where a main is terminating in a cul-de-sac, it will be terminated in loops in accordance with the requirements of Irish Water Code of Practice for Water Infrastructure. The proposed watermain network incorporates sufficient fire hydrants to ensure that all buildings are within 46m of same as per BS750.

All watermain infrastructure shall be designed and constructed in accordance with Irish Water documents “Code of Practice for Water Infrastructure” and “Water Infrastructure Standard Details”.

Please refer to ORS drawing no. 221244-ORS-ZZ-00-DR-CE-401 for details of the proposed water supply infrastructure.

4.3 Wastewater Network

A COF letter is still to be received from Irish Water to ensure there is sufficient capacity to cater for this development.

The proposal for the wastewater for this development is for 1No. connection to the existing wastewater network. The wastewater from the entire development will fall by gravity and connect into an existing 225mm diameter wastewater sewer located on Ballymount Road Upper.

The anticipated wastewater volume generated from the entire development has been calculated in accordance with Irish Water – Code of Practice for Wastewater Infrastructure. The water usage per person has been taken as 50 litres per day for staff and 10 litres per day for visitors. Therefore, as calculated in **Appendix D**, the anticipated total daily flow for the development will be approximately 3.5 m^3/day. This translates to a Dry Weather Flow of 0.04l/s or Peak Dry Weather Flow (4.5DWF) of 0.18l/s.

150mm diameter pipes will be provided between access junctions falling at a grade of 1 in 100. All internal wastewater drainage will be separate to surface water drainage infrastructure in accordance with Irish Water standards. Proposed wastewater sewer loading calculations are attached in **Appendix D**.

All wastewater infrastructure shall be designed and constructed in accordance with Irish Water documents “Code of Practice for Wastewater Infrastructure” and “Wastewater Infrastructure Standard Details”.

Please refer to ORS drawing no. 221244-ORS-Z2-00-DR-C-400 for details of the proposed wastewater drainage infrastructure.

5. Surface Water Drainage

5.1 Drainage Strategy

The proposed site will be served via below ground gravity pipework which will run below the yard and below the road alongside the development. The surface water network will be fed via an ACO channel in the yard, on-road gullies, and rainwater from the building roof via guttering and downpipes.

It is proposed to collect run-off generated from impermeable areas of the site and attenuate the runoff in SuDS measures. In developing the surface water design for the site, a range of SuDS measures were reviewed. Measures which were deemed suitable in controlling the quality and quantity of water discharged from the development include:

- Rainwater harvesting;
- Collection of excess roof rainwater and run-off from impermeable surfaces and attenuating this run-off prior to discharge to outfall locations;
- The use of trapped gullies throughout the development;
- Permeable paving;
- Soakaways;
- Swale behind the building;
- The use of an oil interceptor.

The excess surface water runoff will be attenuated prior to discharging to the existing 300mm diameter surface water pipe located to the southwest of the site. It is proposed to provide attenuation within a 1450m^3 attenuation tank in the south-eastern side of the site. This tank has been sized to store both surface water and fire water, in the event of a fire.

The rainwater from the roof of the building will be collected and will fall by gravity. On the northwestern side of the building, it will discharge into the soakaway behind the building. The soakaway will allow runoff to infiltrate into the subsoil. On the southern side of the building, the rainwater from the roof will flow by gravity through the system of 225mm to 375mm pipes at a gradient 1:150 - 1:200 on the southeast and southwest of the building, and then to the 10,000l precast concrete rainwater harvesting tank located at the entrance to the site.

The discharge from the impermeable paving will be collected via the system of ACO channels in the yard area and gullies on the road.

Prior to the surface water discharging into the existing public drainage system, it will be flow-controlled to greenfield runoff rates and will pass through a full retention oil interceptor.

The following design criteria has been incorporated into the design:

- Pipes are designed for small catchment areas as defined in GDSDS, based on the Modified Rational Method and a rainfall intensity of 50mm/hour onto impermeable surfaces.
- All surface water pipes have been designed to achieve a minimum self-cleansing velocity of 0.75m/s.
- Surface water pipework will be laid to a gradient no flatter than 1:500.
- The GDSDS requirements with respect to interception volume, long-term storage

volume and treatment volume have been considered.
- Minimum surface water pipe size of 225mm
- Minimum depth of cover to pipework of 1.2m below roads without appropriate protection
- Maximum depth of pipework 5m
- Roughness value for surface water pipework, k_s 0.6mm

5.2 Rainfall & Soil Characteristics

Rainfall and soil characteristics are summarised below in table 1 for the area of the site. Soil characteristics are taken from the HR Wallingford database for the site location.

Table 1 - Rainfall & Soil Characteristics (Adopted from GDSDS)

Characteristic	**Value**
Mean Annual Rainfall SAAR mm	849
Ratio 'r'	0.28
M5-60 mm	17.5
Soil SPR Value % Runoff	0.30 (SOIL Type 1)
Max rainfall intensity depth for stormwater network design mm/hr	50

5.3 Catchment and SuDS Systems

The proposed site layout has been designed to have its own storage via permeable paving, attenuation and rainwater harvesting tanks and soakaway. Each catchment will have a gravity surface water drainage network which will outfall into a dedicated SuDS area. The permeable paving, tanks and soakaway will be sized to store the runoff from a 1:100-year storm of critical duration plus a 20% climate change allowance. From the modelling carried out of the stormwater network, a minimum storage of 410m^3 is required in the offline attenuation tank. A tank of size 1450m^3 has been provided; this tank has been sized to store surface water and also fire water in the event of a fire. In addition to this, storage is provided in the permeable paving, soakaway, rainwater harvesting tank and swale. The attenuation storage provided is greater than the attenuation required and is therefore determined to be sufficient.

Refer to **Appendix F** for the storm water network calculations for the development.

A breakdown of the different land uses across the site is included below in Table 5.1 below.

Table 5.1 – Catchment Land Uses/Area

Catchment Area (%Runoff Coefficient)	Areas (Hectares)
Yard Areas (90%)	0.347
Footpath Areas (90%)	0.064
Roof Areas (95%)	0.469
Permeable Parking Spaces (50%)	0.111
Landscaped Green Space (10%)	0.189
Catchment: Total Area	**1.180**

Refer to ORS drawing nos. 221244-ORS-ZZ-XX-DR-CE-421 for the attenuation tank and typical SuDS details.

Summary of SUDS measures reviewed and incorporated is included in Appendix G.

5.4 Flow Controls

The surface water collected within the site will flow into the SuDs measures and where possible will infiltrate into the subsoil or discharge to the proposed 225mm surface water network. The final manhole before the discharge shall include a flow control device to limit flows to greenfield run-off rates.

5.4 Oil Interceptors

A full retention oil Interceptor will be installed prior to discharge into the existing surface water system on Ballymount Road Upper. All surface water shall be drained from impermeable areas through precast lockable gully traps.

Please refer to ORS drawing nos. 221244-ORS-ZZ-00-DR-CE-400, 221244-ORS-ZZ-00-DR-CE-401, 221244-ORS-ZZ-00-DR-CE-420 and 221244-ORS-ZZ-00-DR-CE-421 for details of the proposed surface water drainage for the development.

6. Flood Risk Identification

The Floodinfo.ie website was consulted for high level information on any potential flood risk on the site. The site is not in an area of defined flood risk under the OPW mapping and there is no indication of any likely past or future flood incidences in the vicinity of the site. Refer to figure 6.1 below.

The development will present no significant increase in risk of flooding either within the site or downstream of the site. Surface water runoff will be limited to greenfield runoff rates via flow control measures.

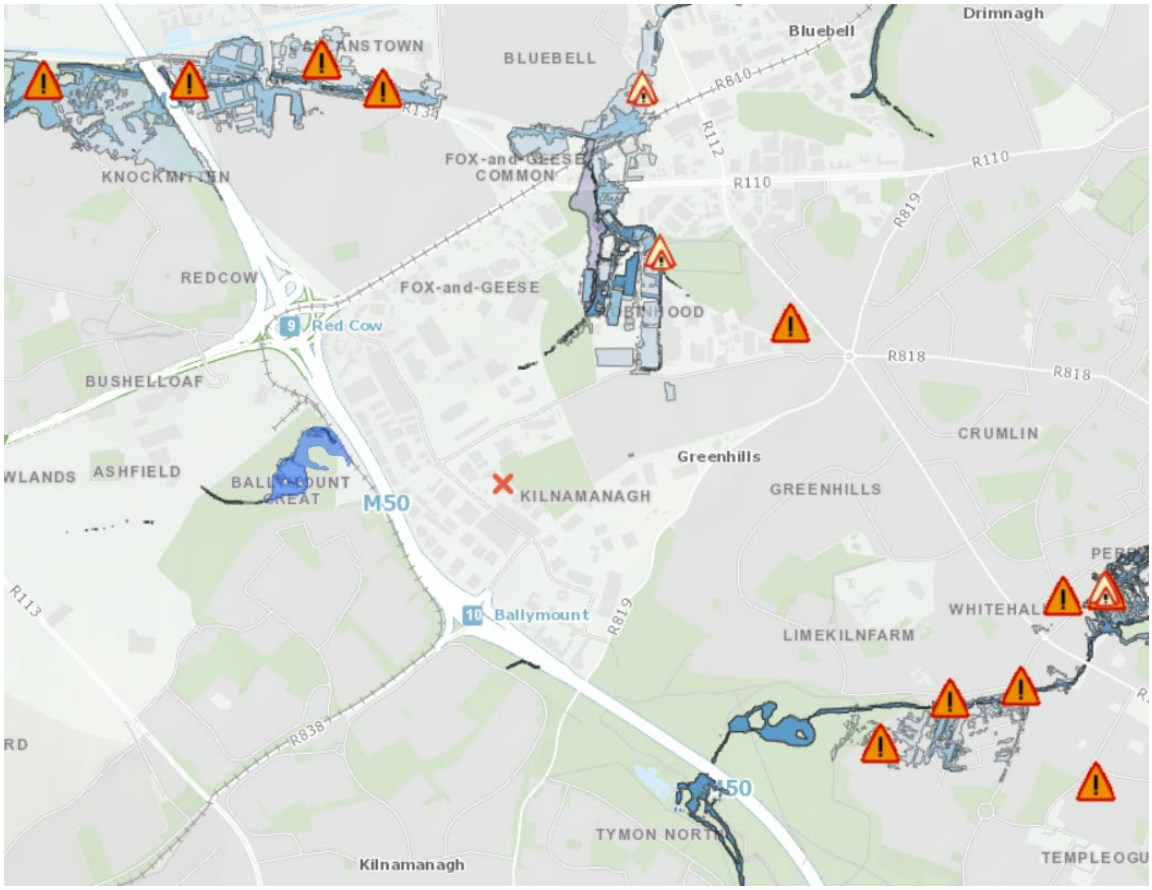


Figure 6.1 – Floodinfo Map – approximate site location marked with red X.

7. Site Access and Traffic

Guidance has been taken from DMURS for the engineering design of streets and footpaths in the development, the following criteria are addressed as follows.

Sightlines of 49m will be achieved at the site entrance in accordance with DMURS given the 50kph speed limit and use of the road by public buses.

Internal road markings are proposed to be limited to the approach to internal junctions and STOP lines. A STOP sign will be provided at each internal junction where a STOP line is proposed.

Appropriate dropped kerbs and linemarking will be used at the site entrance to allow for pedestrian desire lines across the entrance. Proposed internal pedestrian pathways will be linked via dropped kerbs and tactile paving. A number of raised uncontrolled, pedestrian crossings are proposed throughout the site also.

All turning areas have been checked by swept path analysis (Autotrack) to ensure sufficient space to allow for emergency vehicles.

Please refer to ORS drawing no. 221244-ORS-ZZ-00-DR-TR-730 for Autotracks of a fire tender and private car.

8. Health and Safety

ORS understand their health and safety responsibilities as set out in the Health and Safety at Work (Construction) Regulations 2013.

ORS

Appendix A – Pre-connection Enquiry Email from Irish Water

From: newconnections
To: Karine Mamikonjana
Subject: CDS23008187 Uisce Éireann Pre-Connection Enquiry EMAIL:0624392
Date: 02 November 2023 16:33:36
Attachments: image.png
image.png

Uisce Éireann Pre Connection Enquiry Ref Number: CDS23008187

Dear Customer,

Thank you for submitting your Pre-connection Enquiry Form for Panda Waste Management, Ballymount Industrial Estate, Ballymount, Dublin . Your Uisce Éireann reference number for your application is CDS23008187, which you can keep for your records.

Next steps in your enquiry:

Assessment of Enquiry: Your enquiry is currently being assessed to confirm it is

technically feasible; we will be in touch once this assessment has been completed. A significant level of analysis is required before we can provide a response. Two of a number of considerations are:

- A review of the available capacity in Uisce Éireann infrastructure versus your requirements.
- The location for connection versus the distance to/from our network.

Where your requirements are of a significant nature for example, multiple properties or commercial/industrial developments, this work may take a period of time to complete.

Getting a Confirmation of Feasibility: If your application is technically feasible, we will issue you with a letter of "Confirmation of Feasibility". This will outline what capital works if any, may be required to upgrade the public infrastructure to cater for your development.
From receipt of your Pre-connection Enquiry, it takes on average 16 weeks to issue a Confirmation of Feasibility.

Design Layout Approval: Where you are proposing to apply for a housing development (two or more properties), a **Statement of Design Acceptance** to your proposal will be required from Uisce Éireann before applying for Planning Permission. Please therefore submit your designs for assessment to Uisce Éireann to ensure they comply with our requirements, in advance of applying for Planning Permission.

Connection Application: Your Confirmation of Feasibility; which is a specific requirement to apply for Planning Permission through the Strategic Housing Development process, will assist you in obtaining your Planning Permission following which you may apply for your connection immediately.

If you have any further queries please contact us on **1800 278 278** or **+353 1 707 2828;** alternatively, you can visit www.water.ie/connections for more information. **Please note that the rates charged for 1850 numbers may vary across different service providers. Calls from mobiles may be more expensive.**

Please do not amend this subject line as it will help us deal with your response.

Yours sincerely,

Customer Service Advisor

Callsave 1800 278 278 | +353 1 707 2828
www.water.ie/connections

Is don duine amháin nó don eintiteas amháin ainmnithe ar an seoladh an fhaisnéis agus d'fhéadfadh ábhar faoi rún, faoi phribhléid nó ábhar atá íogair ó thaobh na tráchtála de a bheith mar chuid den fhaisnéis. Tá toirmeasc ar aon daoine nó aon eititis; nach dóibh siúd an fhaisnéis- aon athbhreithniú a dhéanamh, aon atarchur a dhéanamh nó aon athdháileadh a dhéanamh, nó aon úsáid eile a bhaint as an bhfaisnéis, nó aon ghníomh a bhraithfeadh ar an bhfaisnéis seo a dhéanamh agus d'fhéadfaí an dlí a shárú dá ndéanfaí sin. Séanann Uisce Éireann dliteanas as aon ghníomh agus as aon iarmhairt bunaithe ar úsáid neamhúdaraithe na faisnéise seo. Séanann Uisce Éireann dliteanas maidir le seachadadh iomlán agus ceart na faisnéise sa chumarsáid seo agus séanann Uisce Éireann dliteanas maidir le haon mhoill a bhaineann leis an bhfaisnéis a fháil. Má tá an ríomh-phost seo faighte agat trí dhearmad, déan teagmháil leis an seoltóir más é do thoil é agus scrios an t-ábhar ó gach aon ríomhaire. D'fhéadfadh ríomhphost a bheith so-ghabhálach i leith truaillithe, idircheaptha agus i leith leasuithe neamhúdaraithe. Séanann Uisce Éireann aon fhreagracht as athruithe nó as idircheapadh a rinneadh ar an ríomhphost seo nó as aon dochar do chórais na bhfaighteoirí déanta ag an teachtaireacht seo nó ag a ceangaltáin tar éis a sheolta. Tabhair faoi deara go bhféadfadh monatóireacht a bheith á dhéanamh ar theachtaireachtaí chuig Uisce Éireann agus ó Uisce Éireann d'fhonn ár ngnó a chosaint agus chun a chinntiú go bhfuiltear ag teacht le beartais agus le caighdeáin Uisce Éireann. Is cuideachta gníomhaíochta ainmnithe é Uisce Éireann atá faoi theorainn scaireanna, a bunaíodh de bhun fhorálacha na n-Achtanna um Sheirbhísí Uisce 2007-2022, a bhfuil a bpríomh-ionad gnó ag Teach Colvill, 24-26 Sráid na Talbóide, BÁC 1.

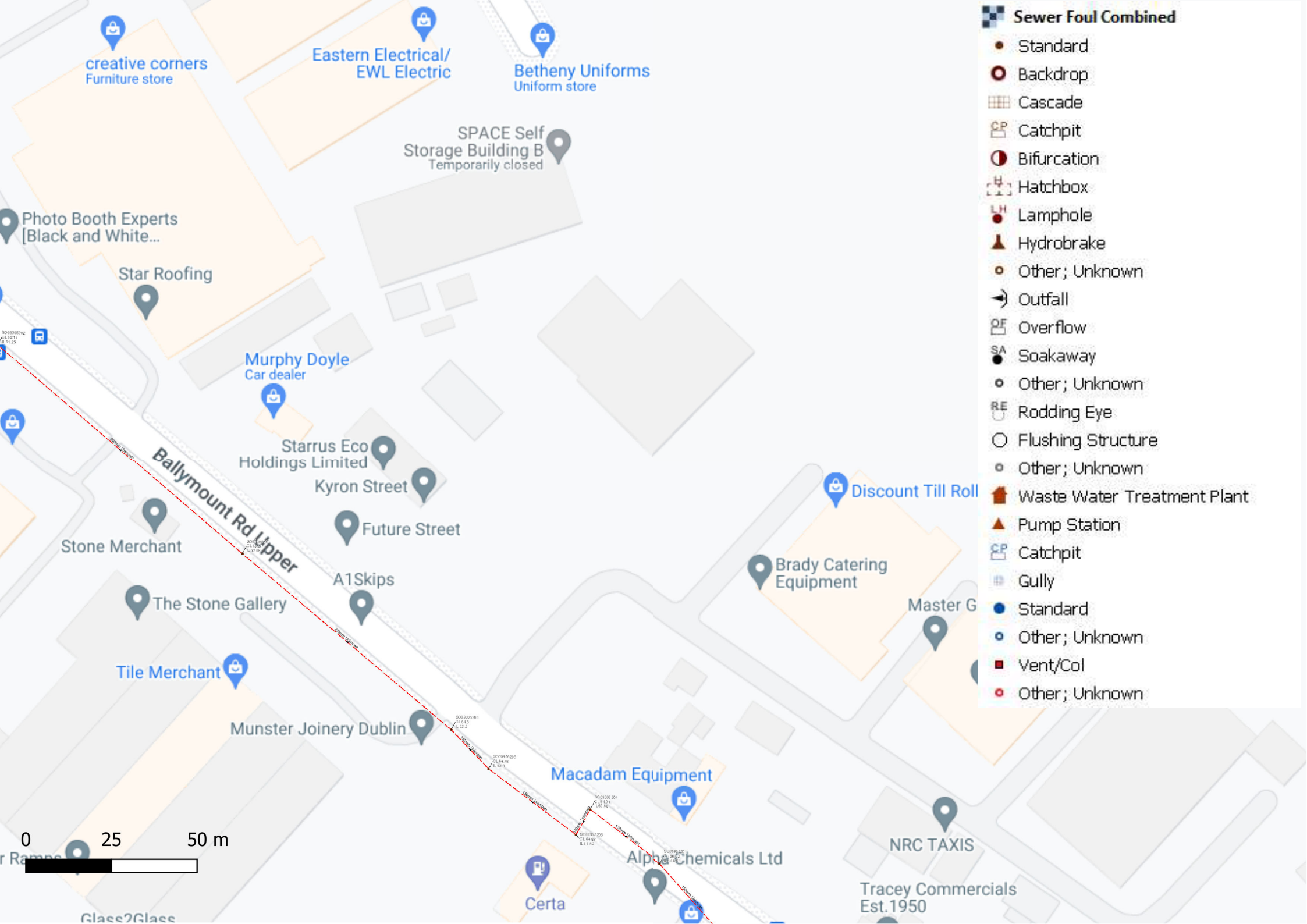
Go raibh maith agat as d'aird a thabhairt.

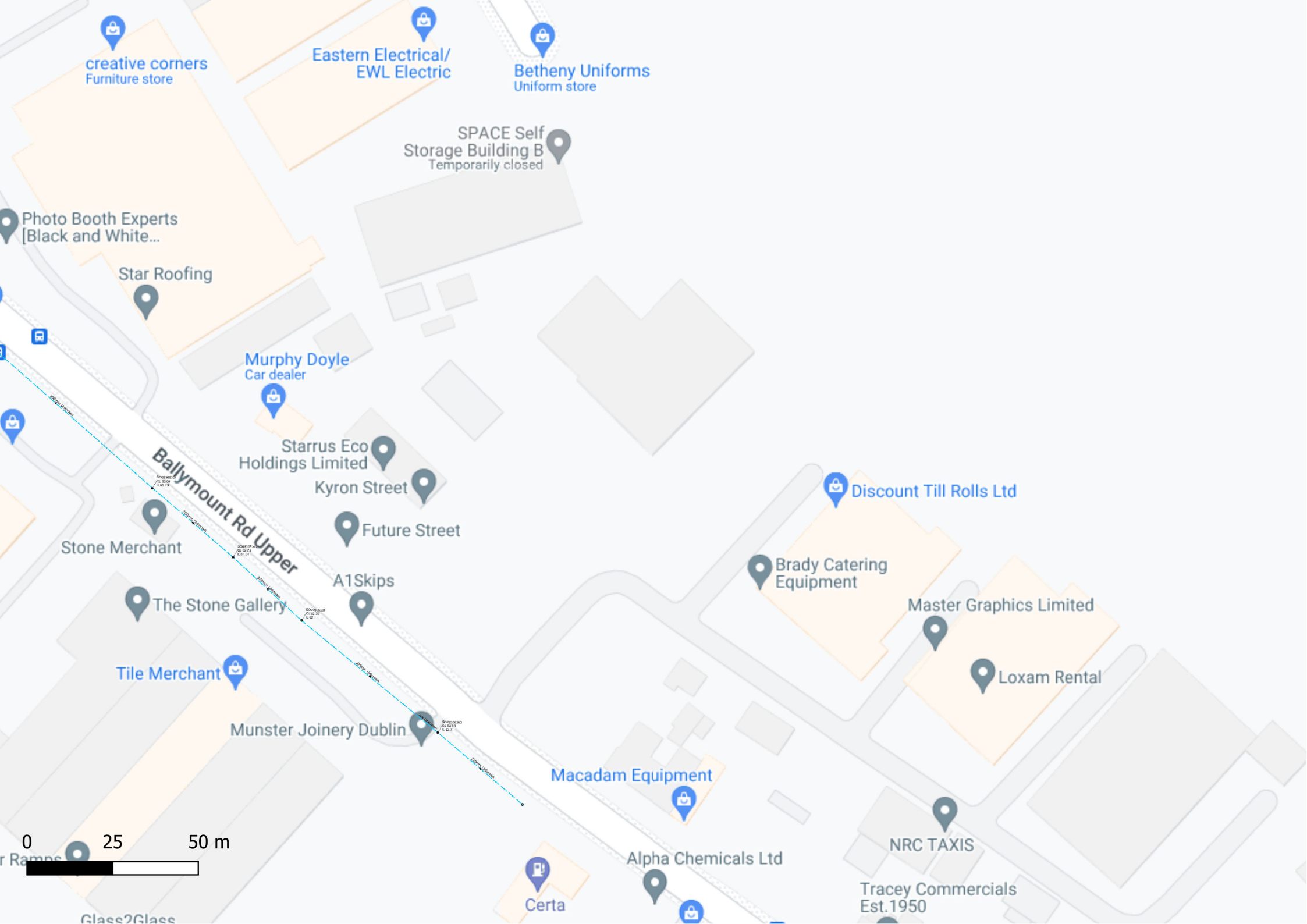
The information transmitted is intended only for the person or entity to which it is addressed and may contain confidential, commercially sensitive and/or privileged material. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon, this information by persons or entities other than the intended recipient is prohibited and may be unlawful. Uisce Éireann accepts no liability for actions or effects based on the prohibited

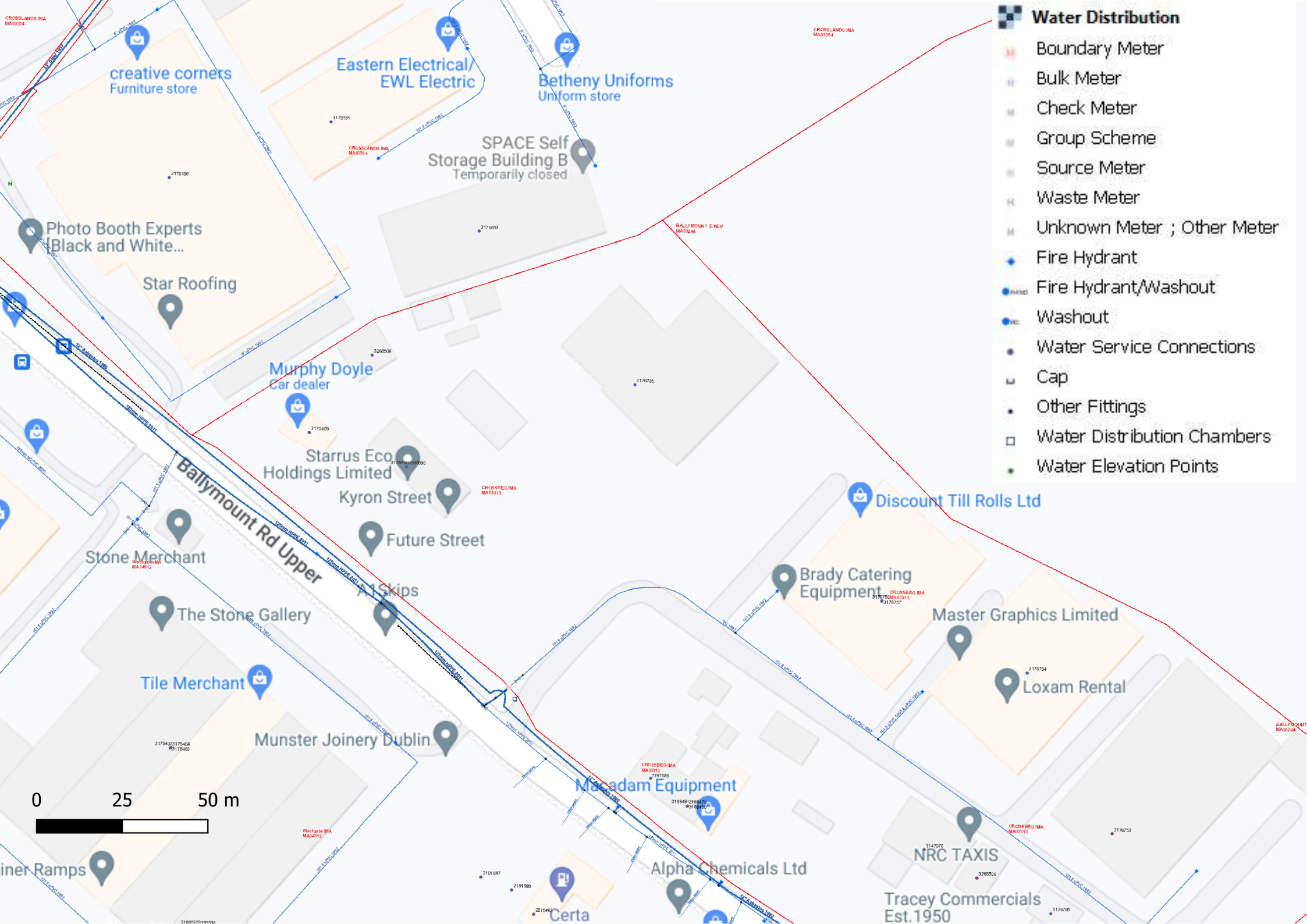
Thank you for your attention.

ORS

Appendix B – Existing Services Infrastructure Maps


creative corners
Furniture store
Eastern Electrical/
EWL Electric
Betheny Uniforms
Uniform store
SPACE Self
Storage Building B
Temporarily closed
Photo Booth Experts
[Black and White...
Star Roofing
Murphy Doyle
Car dealer
Starrus Eco
Holdings Limited
Kyron Street
Future Street
Ballymount Rd Upper
Stone Merchant
A1Skips
The Stone Gallery
Tile Merchant
Munster Joinery Dublin
Discount Till Roll
Brady Catering
Equipment
Master G
Macadam Equipment
NRC TAXIS
Alpha Chemicals Ltd
Certa
Tracey Commercials
Est.1950
Glass2Glass
0
25
50 m
Sewer Foul Combined
Standard
Backdrop
Cascade
Catchpit
Bifurcation
Hatchbox
Lamphole
Hydrobrake
Other; Unknown
Outfall
Overflow
Soakaway
Other; Unknown
Rodding Eye
Flushing Structure
Other; Unknown
Waste Water Treatment Plant
Pump Station
Catchpit
Gully
Standard
Other; Unknown
Vent/Col
Other; Unknown


creative corners
Furniture store
Eastern Electrical/
EWL Electric
Betheny Uniforms
Uniform store
SPACE Self
Storage Building B
Temporarily closed
Photo Booth Experts
[Black and White...
Star Roofing
Murphy Doyle
Car dealer
Starrus Eco
Holdings Limited
Kyron Street
Future Street
Ballymount Rd Upper
Stone Merchant
A1Skips
The Stone Gallery
Tile Merchant
Munster Joinery Dublin
Discount Till Rolls Ltd
Brady Catering
Equipment
Master Graphics Limited
Loxam Rental
Macadam Equipment
NRC TAXIS
Alpha Chemicals Ltd
Certa
Tracey Commercials
Est.1950
Glass2Glass
0
25
50 m


Water Distribution
Boundary Meter
Bulk Meter
Check Meter
Group Scheme
Source Meter
Waste Meter
Unknown Meter ; Other Meter
Fire Hydrant
Fire Hydrant/Washout
Washout
Water Service Connections
Cap
Other Fittings
Water Distribution Chambers
Water Elevation Points
creative corners
Furniture store
Eastern Electrical/
EWL Electric
Betheny Uniforms
Uniform store
SPACE Self
Storage Building B
Temporarily closed
Photo Booth Experts
Black and White...
Star Roofing
Murphy Doyle
Car dealer
Starrus Eco
Holdings Limited
Kyron Street
Future Street
Ballymount Rd Upper
Stone Merchant
A1 Skips
The Stone Gallery
Tile Merchant
Munster Joinery Dublin
Discount Till Rolls Ltd
Brady Catering
Equipment
Master Graphics Limited
Loxam Rental
Macadam Equipment
NRC TAXIS
Alpha Chemicals Ltd
Certa
Tracey Commercials
Est.1950
0
25
50 m

Irish Water Web Map

Water Distribution Network
- Water Treatment Plant
- Water Pump Station
- Storage Cell/Tower
- Dosing Point
- Meter Station
- Abstraction Point
- Telemetry Kiosk

Reservoir
- Potable
- Raw Water

Water Distribution Mains
- Irish Water
- Private

Trunk Water Mains
- Irish Water
- Private

Water Lateral Lines
- Irish Water
- Non IW
- Water Casings
- Water Abandoned Lines
- Boundary Meter
- Bulk/Check Meter
- Group Scheme
- Source Meter
- Waste Meter
- Unknown Meter ; Other Meter
- Non-Return
- PRV
- PSV
- Sluice Line Valve Open/Closed
- Butterfly Line Valve Open/Closed
- Sluice Boundary Valve Open/Closed
- Butterfly Boundary Valve Open/Closed
- Scour Valves
- Single Air Control Valve
- Double Air Control Valve
- Water Stop Valves
- Water Service Connections
- Water Distribution Chambers
- Water Network Junctions
- Pressure Monitoring Point
- Fire Hydrant
- Fire Hydrant/Washout

Water Fittings
- Cap
- Reducer
- Tap
- Other Fittings

Sewer Foul Combined Network
- Waste Water Treatment Plant
- Waste Water Pump station

Sewer Mains Irish Water
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow

Sewer Mains Private
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow
- Sewer Lateral Lines
- Sewer Casings

Sewer Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown

Discharge Type
- Outfall
- Overflow
- Soakaway
- Standard Outlet
- Other; Unknown

Cleanout Type
- Rodding Eye
- Flushing Structure
- Other; Unknown

Sewer Inlets
- Catchpit
- Gully
- Standard
- Other; Unknown

Sewer Fittings
- Vent/Col
- Other; Unknown

Storm Water Network

Surface Water Mains
- Surface Gravity Mains
- Surface Gravity Mains Private
- Surface Water Pressurised Mains
- Surface Water Pressurised Mains Private

Inlet Type
- Gully
- Standard
- Other; Unknown

Storm Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown
- Storm Culverts
- Storm Clean Outs
- Stormwater Chambers

Discharge Type
- Outfall
- Overflow
- Soakaway
- Other; Unknown

Gas Networks Ireland
- Transmission High Pressure Gasline
- Distribution Medium Pressure Gasline
- Distribution Low Pressure Gasline

ESB Networks

ESB HV Lines
- HV Underground
- HV Overhead
- HV Abandoned

ESB MVLV Lines
- MV Overhead Three Phase
- MV Overhead Single Phase
- LV Overhead Three Phase
- LV Overhead Single Phase
- MVLV Underground
- Abandoned

Non Service Categories
- Proposed
- Under Construction
- Out of Service
- Decommissioned

Water Non Service Assets
- Water Point Feature
- Water Pipe
- Water Structure

Waste Non Service Assets
- Waste Point Feature
- Sewer
- Waste Structure

UISCE ÉIREANN : IRISH WATER

Print Date: 17/10/2023

Printed by:Irish Water

ORS

Appendix C – Water Demand Calculation

PROPOSED WATER DEMAND CALCULATIONS

ORS Ref: **221244**

CLIENT: **Starrus Eco Holdings Ltd**
PROJECT DESCRIPTION: **Proposed Waste Processing Facility, Ballymount**
DRAWING REFERENCE: 221244-ORS-Z0-00-DR-C-400

Unit Type:	*Number of shifts:*	*Flow (l/day/person):*	*Persons per development:*	*Total Flow (l/day)*
Industrial without canteen	2	50	20	2000
Delivery drivers*	1	10	150	1500

	Total Flow (l/day):	3500	*Total Flow (m^3/day):*	3.5

Average Hour Water Demand	**0.04**	*l/s*
Peak Hour Water Demand (Average Hour Water Demand x 5)	**0.20**	*l/s*

295 HTV 50%

ORS

Appendix D – Wastewater Demand Calculation

PROPOSED FOUL SEWER DESIGN CALCULATIONS

ORS Ref: **221244**

CLIENT: Starrus Eco Holdings Ltd
PROJECT DESCRIPTION: Proposed Waste Processing Facility, Ballymount
DRAWING REFERENCE: 221244-ORS-Z0-00-DR-C-400

Unit Type:	*Number of shifts:*	*Flow (l/day/person):*	*BOD (g/day/person)*	*Persons*	*Total Flow (l/day)*	*BOD (g/day/person)*	*P.E.*
Industrial without canteen	2	50		20	2000		
Delivery drivers*	1	10		150	1500		
			Total		3500		

Total Flow per day	**3500.00**	*litres/day*
Dry Weather Flow (DWF)	**0.04**	*litres/second*
Peak Dry Weather Flow	**0.18**	*l/s @ 4.5 x DWF*

ORS

Appendix E – Rainfall Data

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 309646, Northing: 230319,

	Interval		Years											
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.4,	3.6,	4.3,	5.3,	6.0,	6.5,	8.4,	10.5,	12.0,	14.1,	16.0,	17.5,	19.9,	21.7,	23.3,	N/A ,
10 mins	3.4,	5.0,	5.9,	7.3,	8.3,	9.1,	11.7,	14.7,	16.7,	19.7,	22.3,	24.4,	27.7,	30.3,	32.4,	N/A ,
15 mins	4.0,	5.9,	7.0,	8.6,	9.8,	10.7,	13.7,	17.3,	19.7,	23.1,	26.3,	28.7,	32.6,	35.6,	38.2,	N/A ,
30 mins	5.2,	7.7,	9.0,	11.1,	12.5,	13.7,	17.4,	21.7,	24.7,	28.8,	32.6,	35.5,	40.2,	43.8,	46.8,	N/A ,
1 hours	6.9,	10.0,	11.7,	14.3,	16.1,	17.5,	22.1,	27.4,	30.9,	35.9,	40.5,	44.0,	49.5,	53.8,	57.4,	N/A ,
2 hours	9.1,	13.1,	15.2,	18.4,	20.6,	22.3,	28.0,	34.4,	38.7,	44.8,	50.2,	54.5,	61.0,	66.1,	70.3,	N/A ,
3 hours	10.8,	15.3,	17.7,	21.4,	23.9,	25.8,	32.2,	39.4,	44.2,	51.0,	57.0,	61.7,	68.9,	74.6,	79.3,	N/A ,
4 hours	12.1,	17.0,	19.7,	23.7,	26.4,	28.6,	35.5,	43.3,	48.5,	55.8,	62.3,	67.4,	75.2,	81.2,	86.3,	N/A ,
6 hours	14.2,	19.9,	22.9,	27.5,	30.6,	33.0,	40.8,	49.6,	55.4,	63.5,	70.7,	76.3,	85.0,	91.6,	97.2,	N/A ,
9 hours	16.7,	23.2,	26.7,	31.9,	35.4,	38.1,	46.9,	56.7,	63.2,	72.3,	80.3,	86.5,	96.0,	103.4,	109.5,	N/A ,
12 hours	18.8,	26.0,	29.8,	35.4,	39.2,	42.2,	51.7,	62.4,	69.4,	79.2,	87.8,	94.5,	104.7,	112.6,	119.2,	N/A ,
18 hours	22.1,	30.3,	34.6,	41.1,	45.4,	48.7,	59.4,	71.4,	79.2,	90.1,	99.7,	107.0,	118.3,	127.1,	134.2,	N/A ,
24 hours	24.8,	33.8,	38.6,	45.6,	50.3,	53.9,	65.6,	78.5,	87.0,	98.7,	109.0,	116.9,	129.1,	138.4,	146.1,	172.8,
2 days	31.0,	41.3,	46.6,	54.3,	59.5,	63.4,	76.0,	89.7,	98.5,	110.7,	121.4,	129.5,	141.8,	151.3,	159.0,	185.6,
3 days	36.0,	47.2,	53.0,	61.4,	66.9,	71.1,	84.4,	98.8,	108.1,	120.7,	131.7,	140.1,	152.8,	162.4,	170.3,	197.3,
4 days	40.3,	52.4,	58.6,	67.5,	73.3,	77.7,	91.7,	106.8,	116.4,	129.5,	140.8,	149.4,	162.4,	172.3,	180.3,	207.8,
6 days	48.0,	61.5,	68.3,	78.1,	84.4,	89.2,	104.3,	120.5,	130.7,	144.6,	156.6,	165.6,	179.2,	189.5,	197.9,	226.3,
8 days	54.7,	69.4,	76.8,	87.3,	94.1,	99.3,	115.3,	132.4,	143.2,	157.8,	170.3,	179.7,	193.9,	204.5,	213.2,	242.4,
10 days	60.9,	76.7,	84.5,	95.7,	102.9,	108.3,	125.3,	143.2,	154.5,	169.7,	182.7,	192.4,	207.0,	218.0,	227.0,	257.0,
12 days	66.7,	83.4,	91.7,	103.5,	111.1,	116.8,	134.5,	153.1,	164.8,	180.6,	194.0,	204.1,	219.2,	230.5,	239.6,	270.5,
16 days	77.4,	95.8,	104.9,	117.7,	126.0,	132.1,	151.2,	171.2,	183.7,	200.4,	214.6,	225.3,	241.1,	253.0,	262.6,	294.8,
20 days	87.3,	107.3,	117.0,	130.8,	139.6,	146.2,	166.4,	187.6,	200.8,	218.4,	233.3,	244.4,	261.0,	273.4,	283.4,	316.7,
25 days	98.8,	120.5,	131.1,	145.9,	155.3,	162.4,	184.0,	206.5,	220.4,	238.9,	254.6,	266.3,	283.6,	296.6,	307.0,	341.8,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

ORS

Appendix F – Storm Water Network Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	10	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Inverts
M5-60 (mm)	17.500	Minimum Backdrop Height (m)	0.200
Ratio-R	0.280	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1.01	0.113	5.00	64.500	1200	709646.445	730387.151	1.000
S1.02			64.500	1200	709598.686	730346.290	1.419
S1.03	0.136	5.00	64.500	1200	709608.314	730334.916	1.504
S1.04			64.300	1350	709570.041	730302.525	1.591
S1.05			64.350	1350	709535.229	730344.181	1.912
S2.01	0.210	5.00	64.500	1200	709660.505	730372.892	1.850
S2.02	0.142	5.00	64.500	1350	709620.302	730338.879	2.042
S2.03	0.051	5.00	64.300	1350	709570.783	730296.984	2.058
S1.06	0.029	5.00	64.350	1350	709526.141	730332.248	2.298
S1.07			64.350	1350	709523.110	730328.411	2.314
S1.08			63.700	1350	709508.486	730309.898	1.751
S3.01		5.00	64.500	1350	709629.585	730330.464	2.000

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
S1.07	S1.07	S1.08	23.592	0.600	62.036	61.949	0.087	271.2	375	8.36	50.0
S1.06	S1.06	S1.07	4.890	0.600	62.052	62.036	0.016	305.6	375	8.00	50.0
S1.05	S1.05	S1.06	15.000	0.600	62.438	62.280	0.158	94.9	375	7.74	50.0
S2.03	S2.03	S1.06	56.890	0.600	62.242	62.052	0.190	299.4	375	7.92	50.0
S2.02	S2.02	S2.03	64.864	0.600	62.458	62.242	0.216	300.3	375	7.01	50.0
S3.01	S3.01	S2.02	12.529	0.600	62.500	62.458	0.042	298.3	375	5.20	50.0
S2.01	S2.01	S2.02	52.661	0.600	62.650	62.474	0.176	299.2	300	5.97	50.0
S1.04	S1.04	S1.05	54.287	0.600	62.709	62.438	0.271	200.3	375	7.61	50.0
S1.03	S1.03	S1.04	50.140	0.600	62.996	62.709	0.287	174.7	300	6.90	50.0
S1.02	S1.02	S1.03	14.902	0.600	63.081	62.996	0.085	175.3	300	6.19	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S1.07	1.095	121.0	101.3	1.939	1.376	0.680	0.0	264	1.221
S1.06	1.031	113.9	101.3	1.923	1.939	0.680	0.0	276	1.159
S1.05	1.860	205.4	37.0	1.537	1.695	0.248	0.0	107	1.423
S2.03	1.042	115.0	60.0	1.683	1.923	0.403	0.0	192	1.052
S2.02	1.040	114.9	52.5	1.667	1.683	0.352	0.0	178	1.017
S3.01	1.044	115.3	0.0	1.625	1.667	0.000	0.0	0	0.000
S2.01	0.904	63.9	31.3	1.550	1.726	0.210	0.0	148	0.898
S1.04	1.276	141.0	37.0	1.216	1.537	0.248	0.0	131	1.082
S1.03	1.186	83.8	37.0	1.204	1.291	0.248	0.0	140	1.151
S1.02	1.184	83.7	16.8	1.119	1.204	0.113	0.0	91	0.930

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
S1.01	S1.01	S1.02	62.853	0.600	63.500	63.081	0.419	150.0	225	5.98	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S1.01	1.065	42.3	16.8	0.775	1.194	0.113	0.0	98	1.003

Pipeline Schedule

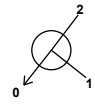
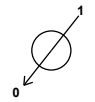
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S1.07	23.592	271.2	375	Circular	64.350	62.036	1.939	63.700	61.949	1.376
S1.06	4.890	305.6	375	Circular	64.350	62.052	1.923	64.350	62.036	1.939
S1.05	15.000	94.9	375	Circular	64.350	62.438	1.537	64.350	62.280	1.695
S2.03	56.890	299.4	375	Circular	64.300	62.242	1.683	64.350	62.052	1.923
S2.02	64.864	300.3	375	Circular	64.500	62.458	1.667	64.300	62.242	1.683
S3.01	12.529	298.3	375	Circular	64.500	62.500	1.625	64.500	62.458	1.667
S2.01	52.661	299.2	300	Circular	64.500	62.650	1.550	64.500	62.474	1.726
S1.04	54.287	200.3	375	Circular	64.300	62.709	1.216	64.350	62.438	1.537
S1.03	50.140	174.7	300	Circular	64.500	62.996	1.204	64.300	62.709	1.291
S1.02	14.902	175.3	300	Circular	64.500	63.081	1.119	64.500	62.996	1.204
S1.01	62.853	150.0	225	Circular	64.500	63.500	0.775	64.500	63.081	1.194

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1.07	S1.07	1350	Manhole	Adoptable	S1.08	1350	Manhole	Adoptable
S1.06	S1.06	1350	Manhole	Adoptable	S1.07	1350	Manhole	Adoptable
S1.05	S1.05	1350	Manhole	Adoptable	S1.06	1350	Manhole	Adoptable
S2.03	S2.03	1350	Manhole	Adoptable	S1.06	1350	Manhole	Adoptable
S2.02	S2.02	1350	Manhole	Adoptable	S2.03	1350	Manhole	Adoptable
S3.01	S3.01	1350	Manhole	Adoptable	S2.02	1350	Manhole	Adoptable
S2.01	S2.01	1200	Manhole	Adoptable	S2.02	1350	Manhole	Adoptable
S1.04	S1.04	1350	Manhole	Adoptable	S1.05	1350	Manhole	Adoptable
S1.03	S1.03	1200	Manhole	Adoptable	S1.04	1350	Manhole	Adoptable
S1.02	S1.02	1200	Manhole	Adoptable	S1.03	1200	Manhole	Adoptable
S1.01	S1.01	1200	Manhole	Adoptable	S1.02	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1.01	709646.445	730387.151	64.500	1.000	1200	 0	S1.01	63.500	225
S1.02	709598.686	730346.290	64.500	1.419	1200	1  0	S1.01 S1.02	63.081 63.081	225 300
S1.03	709608.314	730334.916	64.500	1.504	1200	1  0	S1.02 S1.03	62.996 62.996	300 300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1.04	709570.041	730302.525	64.300	1.591	1350	 1	S1.03	62.709	300
						0	S1.04	62.709	375
S1.05	709535.229	730344.181	64.350	1.912	1350	1	S1.04	62.438	375
						 0	S1.05	62.438	375
S2.01	709660.505	730372.892	64.500	1.850	1200	 0	S2.01	62.650	300
S2.02	709620.302	730338.879	64.500	2.042	1350	1	S3.01	62.458	375
						 2	S2.01	62.474	300
						0	S2.02	62.458	375
S2.03	709570.783	730296.984	64.300	2.058	1350	 1	S2.02	62.242	375
						0	S2.03	62.242	375
S1.06	709526.141	730332.248	64.350	2.298	1350	1	S2.03	62.052	375
						 2	S1.05	62.280	375
						0	S1.06	62.052	375
S1.07	709523.110	730328.411	64.350	2.314	1350	 1	S1.06	62.036	375
						0	S1.07	62.036	375
S1.08	709508.486	730309.898	63.700	1.751	1350	 1	S1.07	61.949	375
S3.01	709629.585	730330.464	64.500	2.000	1350				
						0	S3.01	62.500	375

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	17.500	Additional Storage (m³/ha)	20.0
Ratio-R	0.280	Check Discharge Rate(s)	✓
Summer CV	0.750	100 year (l/s)	4.5
Winter CV	0.840	Check Discharge Volume	x
Analysis Speed	Normal		

Storm Durations

15	30	60	120	240	360	720	1440	2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	20	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Region	2
Greenfield Method	IH124	Growth Factor 100 year	2.63
Positively Drained Area (ha)	0.750	Betterment (%)	0
SAAR (mm)	849	QBar	1.7
Soil Index	1	Q 100 year (l/s)	4.5
SPR	0.30		

Node S1.07 Online Hydro-Brake® Control

Flap Valve	✓	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	62.036	Product Number	CTL-SHE-0061-2000-1500-2000
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node S3.01 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	62.550
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	350.0	0.0	1.200	350.0	0.0	1.201	0.0	0.0

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m³)	
Full Bore Velocity	✓		

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	10	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Inverts
M5-60 (mm)	17.500	Minimum Backdrop Height (m)	0.200
Ratio-R	0.280	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)
Depth/Area 1	0.182	64.500	709563.029	730390.835	2.500

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	17.500	Additional Storage (m³/ha)	20.0
Ratio-R	0.280	Check Discharge Rate(s)	✓
Summer CV	0.750	100 year (l/s)	4.5
Winter CV	0.840	Check Discharge Volume	x
Analysis Speed	Normal		

Storm Durations

15	30	60	120	240	360	720	1440	2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	20	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Region	2
Greenfield Method	IH124	Growth Factor 100 year	2.63
Positively Drained Area (ha)	0.750	Betterment (%)	0
SAAR (mm)	849	QBar	1.7
Soil Index	1	Q 100 year (l/s)	4.5
SPR	0.30		

Node Depth/Area 1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	62.000	Depth (m)	1.500
Side Inf Coefficient (m/hr)	0.18000	Time to half empty (mins)	1188	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.95	Pit Length (m)	15.000		

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m^3)	
Full Bore Velocity	✓		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	114.002	32.259	30 year 240 minute winter	26.341	10.478
2 year 15 minute winter	80.001	32.259	30 year 360 minute summer	30.839	7.936
2 year 30 minute summer	77.960	22.060	30 year 360 minute winter	20.046	7.936
2 year 30 minute winter	54.709	22.060	30 year 720 minute summer	18.349	4.918
2 year 60 minute summer	55.294	14.612	30 year 720 minute winter	12.331	4.918
2 year 60 minute winter	36.736	14.612	30 year 1440 minute summer	11.347	3.041
2 year 120 minute summer	35.783	9.456	30 year 1440 minute winter	7.626	3.041
2 year 120 minute winter	23.773	9.456	30 year 2880 minute summer	7.001	1.876
2 year 240 minute summer	22.982	6.073	30 year 2880 minute winter	4.705	1.876
2 year 240 minute winter	15.268	6.073	100 year +20% CC 15 minute summer	327.534	92.681
2 year 360 minute summer	18.194	4.682	100 year +20% CC 15 minute winter	229.849	92.681
2 year 360 minute winter	11.826	4.682	100 year +20% CC 30 minute summer	225.151	63.710
2 year 720 minute summer	11.156	2.990	100 year +20% CC 30 minute winter	158.001	63.710
2 year 720 minute winter	7.497	2.990	100 year +20% CC 60 minute summer	155.463	41.084
2 year 1440 minute summer	7.116	1.907	100 year +20% CC 60 minute winter	103.286	41.084
2 year 1440 minute winter	4.782	1.907	100 year +20% CC 120 minute summer	97.758	25.835
2 year 2880 minute summer	4.514	1.210	100 year +20% CC 120 minute winter	64.948	25.835
2 year 2880 minute winter	3.034	1.210	100 year +20% CC 240 minute summer	60.509	15.991
30 year 15 minute summer	210.125	59.458	100 year +20% CC 240 minute winter	40.201	15.991
30 year 15 minute winter	147.456	59.458	100 year +20% CC 360 minute summer	46.738	12.027
30 year 30 minute summer	143.699	40.662	100 year +20% CC 360 minute winter	30.381	12.027
30 year 30 minute winter	100.841	40.662	100 year +20% CC 720 minute summer	27.459	7.359
30 year 60 minute summer	99.871	26.393	100 year +20% CC 720 minute winter	18.454	7.359
30 year 60 minute winter	66.352	26.393	100 year +20% CC 1440 minute summer	16.765	4.493
30 year 120 minute summer	63.357	16.744	100 year +20% CC 1440 minute winter	11.267	4.493
30 year 120 minute winter	42.093	16.744	100 year +20% CC 2880 minute summer	10.204	2.735
30 year 240 minute summer	39.647	10.478	100 year +20% CC 2880 minute winter	6.858	2.735

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	Depth/Area 1	1980	62.628	0.628	1.3	45.6898	0.0000	OK

Link Event (Velocity)	US Node	Link	Outflow (l/s)
2880 minute winter	Depth/Area 1	Infiltration	0.6

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Depth/Area 1	1050	62.994	0.994	3.2	72.2937	0.0000	OK

Link Event (Velocity)	US Node	Link	Outflow (l/s)
1440 minute winter	Depth/Area 1	Infiltration	1.0

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Depth/Area 1	1050	63.469	1.469	4.8	106.7720	0.0000	OK

Link Event (Velocity)	US Node	Link	Outflow (l/s)
1440 minute winter	Depth/Area 1	Infiltration	1.5

ORS

Appendix G – SUDS measures

SUDS SELECTION HIERARCHY SHEET FOR LARGE-SCALE DEVELOPMENT				
SuDS Measures	Measures to be used on site	Rational for selecting/non-selecting measure	Area of feature (m^2)	Attenuation volume of feature (m^3)
Source Control - Providing storage at source				
Swales	Yes	There is an opportunity to add a swale on a green strip behind the building	120	25
Integrated constructed tree pits	No	N/A (no trees on site)	-	-
Rainwater Butts	No	N/A – rainwater harvesting tank installed more appropriate for this development	-	-
Downpipe Planters	No	Minimal landscaping proposed adjacent to building	-	-
Rainwater Harvesting	Yes	Selected to re-use rainwater in administration block	7.1	10
Soakaways	Yes	There is an opportunity to build a soakaway to the rear of the building	75	107
Infiltration trenches	No	Chosen for cars parking areas. Unsuited to areas subject to waste movement given EPA requirements for impermeable surfaces	-	-
Green Roofs	No	No opportunity for use of these measures	-	-
Green wall	No			
Filter strips	No			
Bio-retention systems/Raingardens	No			
Blue Roofs	No			
Filter Drain	No			
Site Control				
Detention Basins	No	No opportunity for use of these measures	-	-
Retention basins	No			
Regional Control				
Ponds	No	No opportunity for use of these measures	-	-
Wetlands	No			

Other				
Petrol/Oil interceptor/Grit Trap	Yes	Full retention interceptor to be used in line with EPA licence		
Attenuation tank - only as a last resort where other measures are not feasible	Yes	Requirement for below-ground tank given extent of hard-paved areas required. Over-sized to cater for firewater retention	1210	1450
Permeable pavement (Grasscrete, Block Paving, Porous Asphalt etc)	Yes	For passenger cars parking areas	830	60
Oversized pipes- - only as a last resort where other measures are not feasible	No	Not required	-	-

APPENDIX 3.2

CEMP

Unit 15
Melbourne Business Park
Model Farm Road
Cork T12 WR89

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CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

MATERIALS RECOVERY FACILITY

BALLYMOUNT ROAD UPPER

DUBLIN

Prepared For: -

Starrus Eco Holdings Limited

Prepared By: -

O'Callaghan Moran & Associates
Unit 15
Melbourne Business Park
Model Farm Road
Cork
T12 WR89

November 2023

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1. INTRODUCTION

Starrus Eco Holdings Limited (SEHL) is the holding company for Panda and Greenstar. SEHL appointed O'Callaghan Moran & Associates to prepare a Construction Environmental Management Plan (CEMP) for the redevelopment of a Materials Recovery Facility at Ballymount Road Upper, Dublin 24. The CEMP describes the measures that will be implemented in the Construction Stage to effectively mitigate adverse environmental effects.

1.1 Methodology

The preparation of the CEMP had regard to the following:

- Construction Industry Research and Information Association (CIRIA) guidance which include 133 Waste Minimisation in Construction (CIRIA 133), and the Control of Water Pollution from Construction Sites, Good Practice Guidelines (CIRIA C532).
- BS 5228 (2009+A1:2014) Code of practice for noise and vibration control on construction and open sites - Noise and Vibration.
- European Communities (Birds and Natural Habitats) Regulations (S.I. No. 477/2011)
- The Construction Stage Prevention & Mitigation Measures in the Environmental Impact Assessment Report.
- Resource & Waste Management Plan.
- Provision of adequate environmental training and awareness for all construction staff.

1.2 Revision

This CEMP may be revised following receipt of planning permission and prior to the start of construction works to incorporate any additional mitigation measures that may be imposed by the conditions of the planning permission.

2. PROJECT DESCRIPTION

2.1 Site Location & Layout

The site location is shown on Figure 2.1. It is close to the M50 to the south and occupies approximately 1.18 hectares on the Ballymount Road Upper, which forms the south western boundary of the site.

2.2 Site Layout Surrounding Land Use

The adjoining lands to the east and north east are currently used for agriculture, but for which planning permission has been granted for the construction of warehouses and offices. The adjoining lands on all other sides and across the Ballymount Road Upper are industrial. The nearest private residence is 40m to the south east of the site with residential estates located in the Ballymount Park housing estate, approximately 500m from the western site boundary. There is further housing estates located approximately 700m to the south east of the facility.

2.3 Services

The facility is connected to the Uisce Eireann mains supply, storm sewer and foul water network. The facility is also connected to the national electricity and telephone networks.

2.4 Access

The site is accessed directly from the Ballymount Road Upper which runs parallel to the M50, with access to the M50 in both directions.

2.5 Environmental Setting

2.5.1 Hydrology

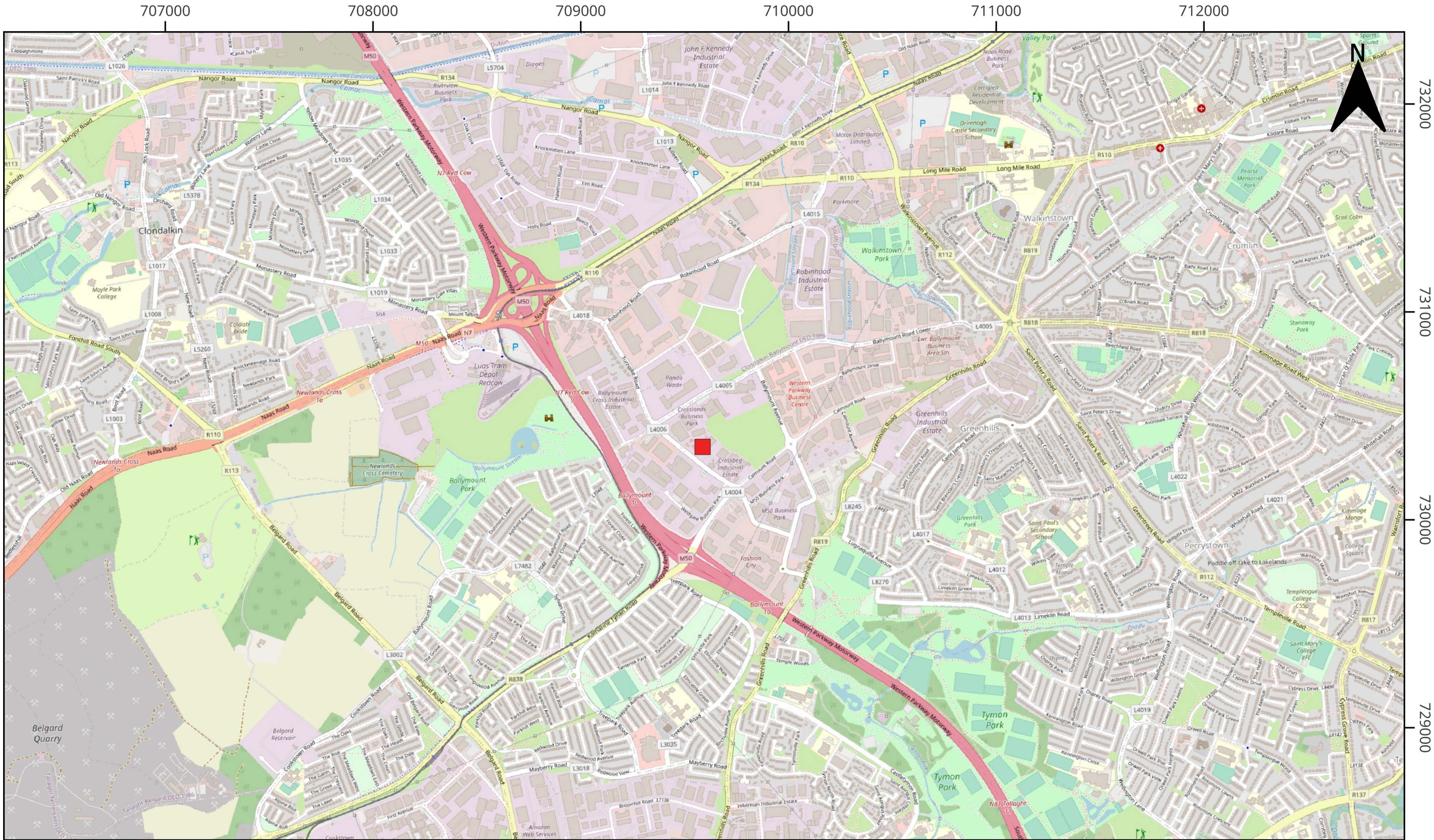
The development site is in the catchment of the River Liffey, which is ca. 3.8km north of the site. There are no watercourses within the site boundary and the closest water feature is Ballymount (Coolfan) Stream (CAMAC_040EA_09C020500), which is approximately 410m northwest of the site. Other streams in the vicinity include Walkinstown (Robinhood) Stream and 1.1km to the north east and the Poddle Stream 1.4km south east of the site. All of these streams are tributaries of the Liffey River.

2.5.2 Geology & Hydrogeology

The site is underlain by made ground on top of natural subsoil comprising glacial tills (boulder clay).ranging from 0.7m to 1.8m in depth. The bedrock is limestone and shale (Calp) whose upper 0.5m is likely to be weathered. It is locally important bedrock aquifer, moderately productive only in local zones and its vulnerability to pollution is 'Extreme'.

2.5.3 Biodiversity

The site is fully developed and paved, with hedgerows/treelines along the western and eastern boundaries that may support birds and small mammals. The nearest designated site of ecological importance is the Wicklow Mountains Special Area of Conservation, which is ca 9.9km to the south.



O'Callaghan Moran & Associates

Unit 15 Melbourne Business Park,
Model Farm Road, Cork.
Tel. (021) 4345366
email: info@ocallaghanmoran.com

Environmental Management for Business

CLIENT Starrus Eco Holdings Ltd.

TITLE Site Location

DETAILS

Site Location

0 500 m

FIGURE 2.1

O'Callaghan Moran & Associates

Unit 15 Melbourne Business Park
Model Farm Road, Cork
Tel. (021) 4345366
email: info@ocallaghanmoran.com

Environmental Management for Business

CLIENT
Starrus Eco Holdings Ltd.

TITLE
Surrounding Land Use

DETAILS
Site Boundary

0 100 m

FIGURE 2.2

3. DEVELOPMENT DESCRIPTION

The current site layout is shown on Figure 3.1. The site encompasses approximately 1.8 hectares and consists of one materials handling building and one office building. The development will involve the demolition of the current buildings and the construction of a new facility consisting of a single waste handling building (4710m^2) including staff welfare facilities and a small site office. The proposed layout is shown on Drawing No. 221244-ORS-Z0-00-DR-AR-203 and will comprise one materials handling building, an electricity substation and two weighbridges.

3.1 Site Layout

The design of the site layout took into consideration the need to:

- Avoid excessive temporary works, e.g. site roads, site offices/foundations, and
- Protect the local natural environment and biodiversity from any adverse impacts associated with the sorting, segregation, storage and transport of construction stage waste.

3.2 Building Design & Layout

The building elevations and sections are shown on Drawing No 221244-ORS-Z0-00-DR-AR-206 in Appendix 1. The building will be a steel portal frame structure, with external preformed and profile sheeting on the walls and low pitch roof cladding. It will be 13.3m above ground level (77.7mOD) to the upper ridge level. Solar panels will be installed on the southern pitch of the roof. The building floor plan is shown on Drawing No 221244-ORS-Z0-00-DR-AR-203 in Appendix 1.

3.3 Services

3.3.1 Water Supply

Water for use in staff welfare facilities will be obtained from mains supply. Rainwater from the roofs of the MRF will be harvested for use as grey water in the staff toilets.

3.3.2 Wastewater

Sanitary wastewater from the staff toilets will discharge to Uisce Eireann foul sewer that runs along the Ballymount Road Upper.

3.3.3 Surface Water Drainage

Rainwater run-off from the building roofs will be harvested for on-site use. Run—off from the yards will be collected and directed to separate on-site SuDs systems.

3.3.4 Electricity Supply

There will be a connection to the national grid and an electrical substation will be provided in the south east of the site.

3.4 Demolition Phases

The demolition of the current buildings will happen within one phase.

3.5 Development Phases

All of the key elements will be constructed in one phase.

4. CONSTRUCTION ACTIVITIES

4.1 Construction Programme

The works will comprise the following;

- Set up site office and contractors compound;
- Securing the site and erecting signage;
- Setting out;
- Building demolition and ripping of existing paved yards
- Provision of hardstand for delivery vehicles for unloading and turning;
- Provision of water, wastewater and stormwater services;
- Building and tank construction and paving, and
- Landscaping

4.2 Construction Schedule

The construction programme will be completed in three stages.

Stage 1 – Site Set Up

This will involve the set-up of site offices and contractors compound, provision of hardstand for vehicles, securing the site and erection of signage and will take one week. The contractor's compound will be located in the south-west of the site, as shown on Drawing No 221244-ORS-Z0-00-DR-AR-230 in Appendix 1

Stage 2 – Site Clearance and Setting Out

This stage will involve the demolition of the current buildings, stripping and stockpiling of subsoils and grading to formation level and will take four weeks.

Stage 3 –Construction of construction and fit out of the buildings, pave yards along with the ancillary services and landscaping. This will be completed in approximately 14 months.

5. METHOD STATEMENT FOR CONSTRUCTION

5.1 Working Hours

The normal working hours shall be 07:00 to 19:00 Monday to Friday (excluding bank holidays) and 08:00 to 14:00 Saturdays, subject to restrictions that may be imposed by the planning permission. Works will not be carried out on Sundays and Public Holidays. Subject to the agreement of South Dublin County Council (SDCC) out of hours activities may be required for certain elements.

5.2 Site Preparatory Works

Preparatory works involves Site Set Up by the Contractor which will include the following:

- Setting of access control to the development area and the erection of directional signage as specified in the Construction Stage Traffic Management Plan.
- All construction related traffic will access the site via the entrance on Ballymount Road Upper.
- Provision of secure compound for the storage of all on-site machinery and materials.
- Demolition of current buildings and removal of waste materials.
- Construction of internal access roads.
- Provision of services and utilities, and
- Provision of security fencing and perimeter hoarding.

Prior to the commencement of construction, the Contractor will contact the relevant bodies (e.g. ESB, Eirgrid, Uisce Eireann) and the landowner to check records and drawings to confirm the locations of existing buried services/utilities.

5.3 Construction Compound

The compound will include a site office and welfare facilities, hardstanding for plant and machinery and a designated waste storage area. Suitably robust fencing will be erected along the boundary.

It will be serviced with electrical power from an on-site generator and will include Portaloo toilet facilities. The generator will contain a built-in double contained fuel storage tank. All liquid chemicals will be stored in the construction compound in bunded storage areas.

5.4 Demolition Works

The facility will be disconnected from the electrical, telecoms and water mains supplies prior to demolition.

5.5 Excavation Works

Subsoils will be excavated to establish formation level for the buildings, roads and underground services, including the oil interceptors, surface water soakaway, infiltration trench and attenuation storage. Tracked 360-degree excavators will be used to excavate the subsoil, and a dumper will be used to move the excavated materials to temporary stockpile locations from where surplus soils will be removed from the site. If required, rock breaking will be carried out using a hydraulic breaker mounted on a tracked excavator.

5.6 Concrete Works

Concrete batching will not be carried out on-site. Excess concrete will be removed from the site and concrete washout will not be permitted. Concrete pouring will be monitored to ensure there is no accidental discharge. Accidental spills will not be hosed down.

5.7 Surface Water/Drainage System

There are no surface water drains/water courses inside the site boundary. The nearest surface water feature is the Ballymount (Coolfan) Stream which is approximately 410m to the northwest. The stream is a tributary of the Liffey River which is to the north of the development site.

5.8 Groundwater

The excavation works will not extend to below the water table and dewatering will not be required.

5.9 Materials – Source and Transportation

The selection and specification of construction materials will be informed by the local availability of these materials. Subject to the necessary constraints of performance, durability and cost, construction materials will be sourced from local suppliers and manufacturers, where possible.

5.10 Oils and Chemical Storage

All oils, fuels, paints and other chemicals will be stored in a secure, bunded, hardstand area. The bund capacity of the bulk oil storage tanks will at a minimum be 110% of the tank. For drum storage, a bund capacity of 25% of the maximum volume of material stored is required. The refuelling and servicing of mobile plant and equipment will only be carried out in a designated hardstand area, where oil spill containment and clean-up equipment will be maintained.

5.11 Traffic Management

A Construction Traffic Management Plan (TMP) has been prepared and a copy is in Appendix 2.

5.12 Health and Safety

As required by the Safety, Health and Welfare at Work (Construction) Regulations 2013, the Contractor appointed to complete the development will prepare a Health and Safety Plan that address site specific health and safety issues from the start to the completion of the construction.

The Contractor will provide 'Site Induction' training for all construction staff and ensure all site staff have current 'Safe Pass' cards. All construction staff will receive a full safety briefing and will be provided with all of the safety equipment required by their assigned tasks.

5.13 Site Security

The Contractor will be responsible for site security, including erecting and maintaining adequate fencing.

6. ENVIRONMENTAL PREVENTION & MITIGATION MEASURES

The Construction Stage involves site clearance including the demolition of the existing buildings, excavation, the construction of the MRF and electrical sub-station, yards, roadways and site entrances and the provision of the associated wastewater and surface water drainage systems. HGVs will deliver construction materials and the mobile plant will include excavators, lifting equipment, dumper trucks, compressors, and generators.

The construction works have the potential to impact on the environment through the generation of noise and dust and impacts on air quality, groundwater and ecology. The Main Contractor shall appoint an experienced site manager who will be responsible for ensuring the mitigation measures specified in this CEMP are effectively implemented throughout the Construction Stage. This will include the provision of staff induction training and regular 'toolbox' talks.

6.1 Noise & Vibration

The Main Contractor shall be responsible for compliance with the requirements of BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites) and the Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration.

Although construction phase noise emissions will be short term, given the distance between the site and the nearest sensitive receptor (500m) from the site boundary the following mitigation measures will be implemented:

- Works will in general be confined to the period Monday-Friday 0700-1900, and Saturday 8000-1400;
- Hooting will be prohibited onsite. Drivers of plant and vehicles will be instructed to avoiding hooting at all times;
- Plant used on-site will be maintained in a satisfactory condition and in accordance with manufacturer recommendations. In particular, exhaust silencers will be fitted and operating correctly at all times. Defective silencers shall be immediately replaced;
- Plant items will only be left running during works and will be switched off at all other times. Plant will not be left idling;
- Selection of quiet plant/location of plant; plant which will have the least impact in term of noise will be selected and will be positioned as far away as practical from noise sensitive receptors;
- All vehicles and mobile plant will have effective exhaust silencers, and these will be subject to regular maintenance to ensure they remain fit for purpose. All diesel fuelled plant will have effective air intake silencers;
- Pneumatic percussive tools (air drills, hammers, rammers etc) will be fitted with the manufacturer's recommended mufflers or silencers'.

- All noise complaints will be logged by the Site Manager in a register and investigated immediately. Details of follow-up action will be included in the register.

6.2 Air

6.2.1 Dust

Dust emissions are likely to arise from demolition works, earthworks, wind blow from temporary soil stockpiles; construction traffic movements; handling of construction materials and landscaping. Given the distance between the development site and the nearest sensitive receptor the risk of dust soiling at the nearest residences is low; however the following control measures will be implemented:

- The Contractor shall prepare a site-specific Dust Management Plan prior to the start of the works;
- Spraying of exposed earthworks, soil stockpiles and site haul roads during dry weather using mobile bowser units;
- Provision of a power wash at the site entrance road to remove dirt from vehicles before they leave the site;
- Paved roads will be regularly swept to remove mud and debris and traffic movements on non-paved areas will be restricted to essential site traffic;
- Control of vehicle speeds;
- Material drop heights from plant to plant or from plant to stockpile will be minimised, and
- The Ballymount Road Upper will be inspected daily for cleanliness and cleaned as required using a mechanical road sweeper.

6.2.2 Engine Exhaust Emissions

The following mitigation measures will be implemented:

- Construction materials will where possible be sourced locally so as to minimise transport distances;
- Engines will be turned off when machinery is not in use, and
- Regular maintenance of vehicles, plant and equipment.

6.3 Land & Soil

The following mitigation measures will be implemented to minimise the risk of soil contamination:

- Excavation of the subsoils will only be undertaken when absolutely necessary as this can lead to sediment run off and leaching of nutrients from soils into the groundwater;
- Excavated soils not immediately reused will be stockpiled to minimise the effects of weathering;
- Good housekeeping (daily site clean-ups, use of disposal bins, etc.) and the proper use, storage and disposal of substances and their containers;
- Regular plant maintenance to minimise oil leaks;
- Diesel fuelled plant refuelling will only be undertaken by trained personnel in areas where appropriate spill control materials are to hand (spill mats, oil dry). Any spillages will be immediately contained, and the contaminated soil excavated and sent to an appropriately licensed waste management facility;
- Pouring of cementitious materials will be carried out where possible in dry periods based on weather forecasts. Plastic covers will be available in case of a sudden rainfall event;
- The concrete pumping will be monitored to ensure no accidental discharge;
- Excess concrete will be removed from the site and concrete washout, will not be permitted, and
- There will be no hosing into surface water drains of spills of concrete, cement, grout or similar materials.

6.4 Water

There are no water courses or drains either inside or adjacent to the site boundary. The mitigation measures described in Section 6.3 are equally relevant to the protection of surface water and groundwater.

6.5 Biodiversity

All works will be confined to within the development site boundary. A buffer shall be maintained between all working, storage and parking areas and the treelines along the western and eastern boundaries that are to be retained.

- Site lighting will be at the lowest level needed for safety and security purposes and wherever possible will be will be restricted to the working area and set up to avoid overspill and shadows on sensitive habitats outside the construction area;
- Where possible trees will be not be removed between the bird breeding season of 1st March and 31st August;

- Trees will be protected in accordance with BS: 5837:2012 Trees in relation to design, demolition and construction recommendations and any further agreed procedures. The reinstatement of trees and vegetation will be undertaken by a suitably qualified landscape contractor.

- As a biodiversity enhancement measure four bat boxes will be put up within the site boundary. The location will be specified by an ecologist taking into account landscape plans, vehicle movements and lighting.

- As noted above vegetation will be removed outside of the breeding season where possible and in particular, removal during the peak-breeding season (April-June inclusive) will be avoided. This will also minimise the potential disturbance of breeding birds outside of the study area boundary.

- The buddleia will be treated by specialist invasive species contractor and based on the mitigation options recommended in Section 8.10.2.4 of the EIAR.

- Site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties

6.5.1 Landscape

New hedgerows will be planted to extend the existing south-eastern hedgerow and form a new hedgerow along the north-eastern boundary. The existing hedgerow will be augmented by planting with native species.

7. MONITORING

An Environmental Monitoring Programme will be implemented for the duration of the works. The scope will be based on the conditions of the planning permission and will be confirmed with SDCC in advance of the works. The preliminary scope is below.

7.1 Dust Deposition

If required by the planning conditions, dust deposition monitoring will be carried out at locations and frequencies agreed with the Council. The monitoring will be carried out using Bergerhoff gauges specified in the German Engineering Institute VDI 2119 document entitled 'Measurement of Dustfall Using the Bergerhoff Instrument' (Standard Method).

The gauges will be set up such that the containers were approximately 2m above the ground surface. To inhibit the growth of algae, 10ml of copper sulphate will be added to each jar. The monitoring period shall be between 28 and 32 days. The proposed deposition limit is 350 mg/m2/day.

7.2 Biodiversity

A bat specialist will attend the site during tree felling to check for the presence of bats.

7.3 Noise Monitoring

If required by the planning conditions noise monitoring will be carried out at noise sensitive locations and frequency agreed with the Council. The monitoring will be in accordance with International Standard ISO 1996-2:2017 Acoustics – Description, measurement and assessment of environmental noise, Part 2: Determination of environmental noise levels (2017). The noise limits will be as conditioned in the planning permission.

7.4 Works Area

The site will be inspected daily to ensure that buffer zones between the working areas and hedgerows are maintained and that the oil and chemical storage and handling areas and the waste storage areas are appropriately managed.

7.5 Landscape Works

Regular inspections will be conducted out to ensure that the landscaping is carried out in accordance with the landscape plans and the tree protection measures are correctly implemented.

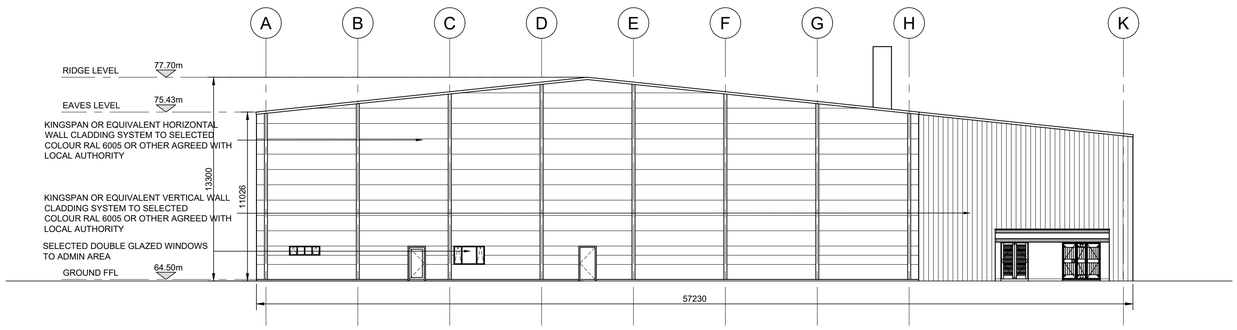
7.6 Reporting

The results of the monitoring will be submitted to SDCC.

APPENDIX 1

DRAWINGS

A1



PROPOSED SOUTHWEST ELEVATION

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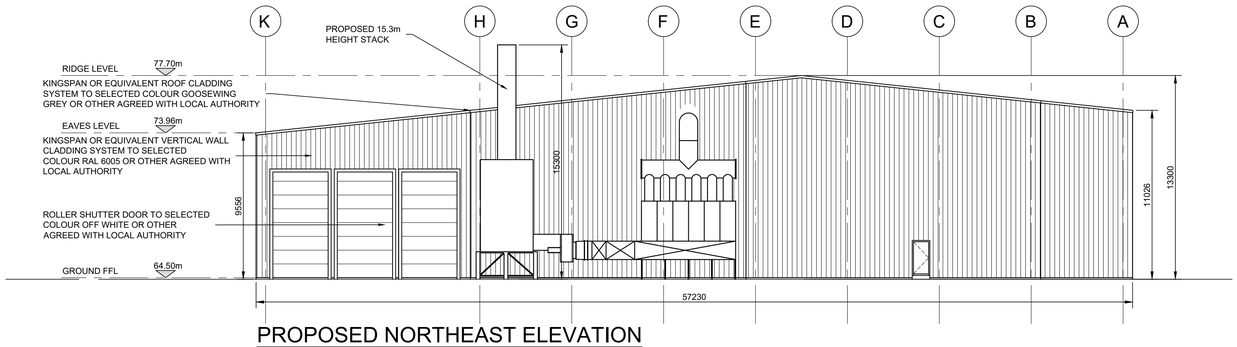

PROPOSED NORTHEAST ELEVATION

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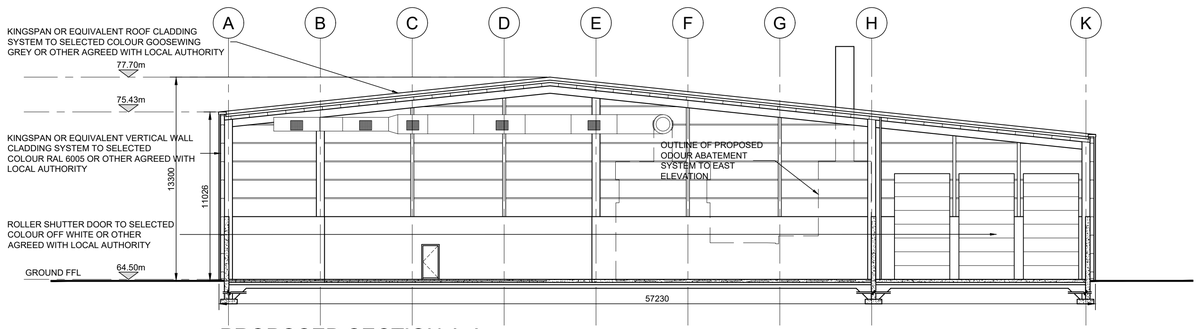

PROPOSED SECTION A-A

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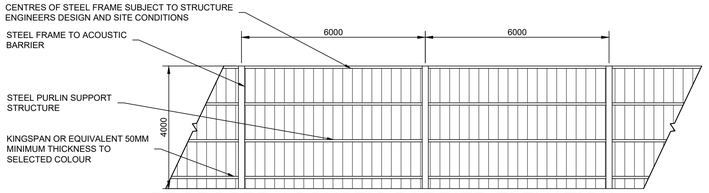

PROPOSED ACOUSTIC BARRIER ELEVATION

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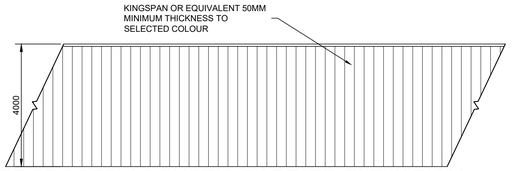

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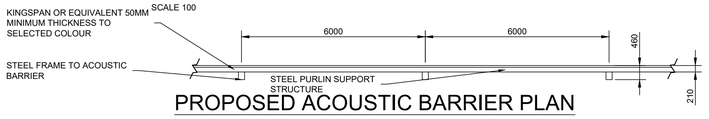

PROPOSED ACOUSTIC BARRIER PLAN

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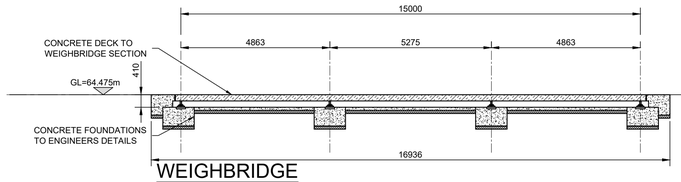

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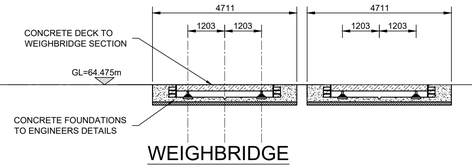

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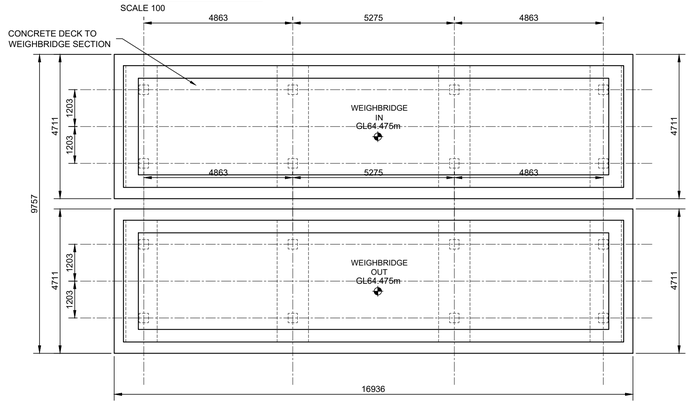

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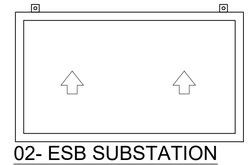

02- ESB SUBSTATION ROOF PLAN

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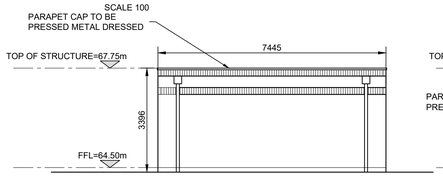

ESB SUBSTATION NORTHEAST

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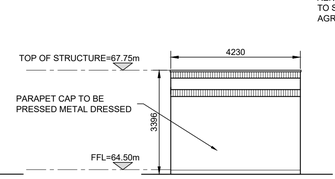

ESB SUBSTATION NORTHWEST

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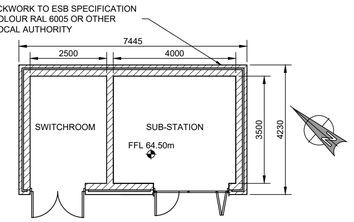

ESB SUBSTATION FLOOR PLAN

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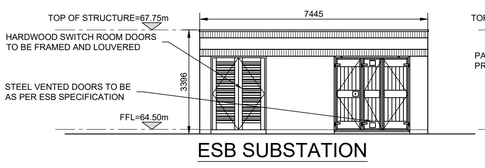

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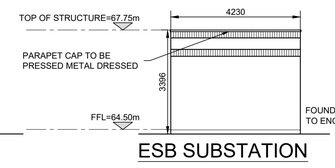

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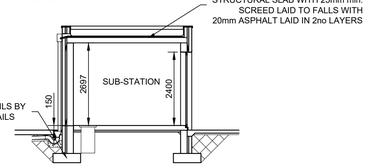

ESB SUBSTATION TYPICAL SECTION

SCALE 1:100

INFORMATION

Figured dimension only to be taken from this drawing.
All dimensions to be checked on site.
Consultants to be informed immediately of any discrepancies before work proceeds.

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	10/05/2023	ISSUED FOR COMMENT	CB	CB
P02	12/06/2023	SITE LAYOUT UPDATED	CB	CB
P03	12/07/2023	BUILDING AND SITE LAYOUT UPDATED	CB	CB
P04	28/08/2023	BUILDING LAYOUT UPDATED	CB	CB
P05	02/10/2023	ISSUED FOR COMMENT	CB	CB
P06	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24
TITLE:	PROPOSED ELEVATIONS, ACOUSTIC BARRIER, WEIGHBRIDGE & SUBSTATION

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
CB	CB	OD	221244	P06
DATE: 01/12/2023	SCALE: 1:200		DRAWING NO: 221244-ORS-Z1-ZZ-DR-AR-206	

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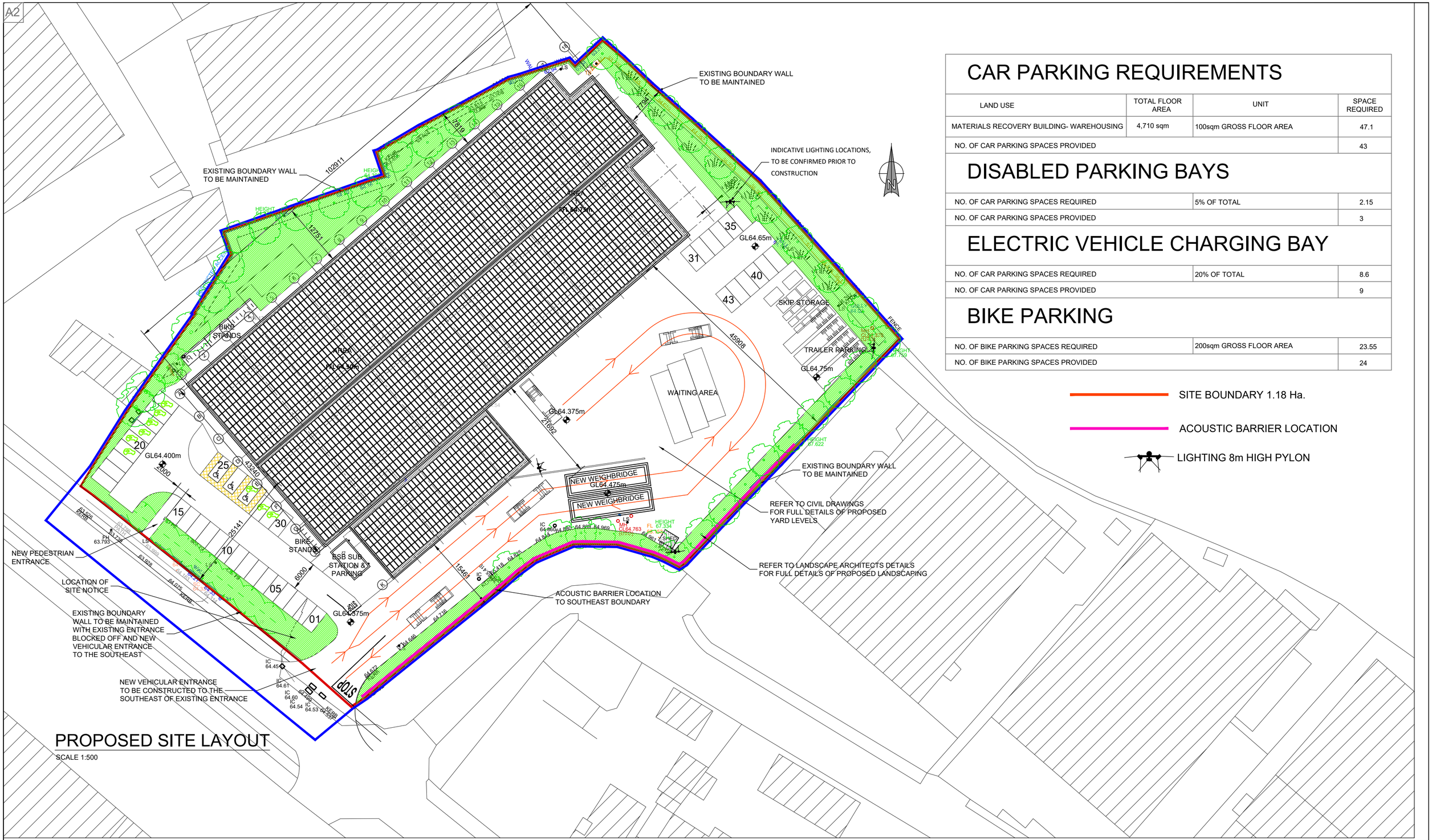
A2



PROPOSED SITE LAYOUT

SCALE 1:500

CAR PARKING REQUIREMENTS

LAND USE	TOTAL FLOOR AREA	UNIT	SPACE REQUIRED
MATERIALS RECOVERY BUILDING- WAREHOUSING	4,710 sqm	100sqm GROSS FLOOR AREA	47.1
NO. OF CAR PARKING SPACES PROVIDED			43

DISABLED PARKING BAYS

NO. OF CAR PARKING SPACES REQUIRED	5% OF TOTAL	2.15
NO. OF CAR PARKING SPACES PROVIDED		3

ELECTRIC VEHICLE CHARGING BAY

NO. OF CAR PARKING SPACES REQUIRED	20% OF TOTAL	8.6
NO. OF CAR PARKING SPACES PROVIDED		9

BIKE PARKING

NO. OF BIKE PARKING SPACES REQUIRED	200sqm GROSS FLOOR AREA	23.55
NO. OF BIKE PARKING SPACES PROVIDED		24

SITE BOUNDARY 1.18 Ha.

ACOUSTIC BARRIER LOCATION

LIGHTING 8m HIGH PYLON

INFORMATION

Figured dimension only to be taken from this drawing.
All dimensions to be checked on site.
Consultants to be informed immediately of any discrepancies before work proceeds.

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	10/05/2023	ISSUED FOR COMMENT	CB	CB
P02	12/06/2023	SITE LAYOUT UPDATED	CB	CB
P03	12/07/2023	BUILDING AND SITE LAYOUT UPDATED	CB	CB
P04	28/08/2023	BUILDING LAYOUT UPDATED	CB	CB
P05	02/10/2023	ISSUED FOR COMMENT	CB	CB
P06	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24
TITLE:	PROPOSED SITE LAYOUT

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
CB	CB	OD	221244	P06
DATE: 01/12/2023	SCALE: 1:500		DRAWING NO: 221244-ORS-Z0-00-DR-AR-203	

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APPENDIX 2

TRAFFIC MANAGEMENT PLAN

FRAMEWORK CONSTRUCTION TRAFFIC MANAGEMENT PLAN

Panda Waste Facility, Ballymount

November 2023

SYSTRA

DOCUMENT CONTROL SHEET

IDENTIFICATION TABLE	
Client/Project owner	Starrus Eco Holdings Ltd
Project	Panda Waste Facility, Ballymount
Study	Framework Construction Traffic Management Plan
Type of document	Report
Date	03/11/2023
Reference number	IE01T23B01 – SCO1
Number of pages	14

APPROVAL					
Version	**Name**		**Position**	**Date**	**Modifications**
R003	Author	Craig Gow	Planner	30/11/2023	Planning Issue
	Checked by	Glen Moon	Principal	30/11/2023	
	Approved by	Glen Moon	Principal	30/11/2023	

TABLE OF CONTENTS

LIST OF FIGURES

1. INTRODUCTION

1.1 General

1.1.1 Systra Ltd has been commissioned by Starrus Eco Holdings Ltd (SEHL) to provide transport and highways advice in relation to the proposed redevelopment of the existing multi-processing facility at Panda Waste, which is located on Ballymount Road Upper, in the Ballymount area of Dublin.

1.1.2 The local planning and highway authority is South Dublin City Council (SDCC).

1.2 Proposed Development

1.2.1 The existing facility comprises:

- A one-storey waste processing building, with a floor area of ~1,600sqm
- A two-storey office building, with a floor area of ~700sqm.

1.2.2 The facility operates 24 hours a day, seven days a week. The proposals aim to increase the tonnage of waste processed from 150,000 tonnes to 350,000 tonnes per year. This will require the redevelopment and modernisation of the facility, to enable it to deliver this increased throughput.

1.2.3 The development will consist of:

- Demolition of all existing buildings on the site.
- Construction of a 4,710 sq m one-storey material recovery building, which will include an ancillary administration reception office, a canteen, WCs, and storage space.

1.2.4 A full description of the development is provided in Section 5 of the Transport Assessment (TA).

1.2.5 Vehicular access to the site during construction would remain as at present, with all vehicles accessing the site via the site access junction on Ballymount Road Upper.

1.3 Objective of the CTMP

1.3.1 The purpose of the CTMP is to minimise traffic and transport impacts during the construction of the development, and to bring forward management and mitigation measures that will address any potential traffic impacts (and associated environmental impacts) during the construction period.

1.3.2 At this stage, a Framework CTMP has been prepared. The CTMP is intended be a working document that continues to evolve post-planning, once the main contractor has been appointed and more construction details are known.

2. MEASURES TO REDUCE & MITIGATE IMPACTS

2.1.1 This section of the CTMP sets out the mitigation measures that could be employed during construction to minimise the impact of construction traffic on the local residents, businesses and the local highway network.

2.2 Vehicular Access to Site

2.2.1 Access to the construction site will be taken from the exisitng access point on Ballymount Road Upper. Signage will be put in place so that approaching vehicles are aware of the Construction Site access, and the presence of turning HGVs.

2.3 Construction Site Operating Hours

2.3.1 Construction activities will be undertaken during the following hours:

- 07:00 – 18:00 Monday to Friday; and
- 07:00 – 12:00 Saturday.

2.3.2 Where feasible the contractor will seek to minimise deliveries during the peak hours (07:30-09:00 and 16:30-18:00). There will be no external construction activities or scheduled deliveries on a Sunday or on Bank Holidays, unless absolutely essential, and agreed in advance with SDCC.

2.4 Delivery Control

2.4.1 The main contractor will be responsible for planning and managing deliveries and collections from the site to minimise the impact on the surrounding road network. Deliveries will be planned well in advance, and on-site activities will be co-ordinated so that concentrated peaks in traffic movements on and off the site are avoided.

2.4.2 All deliveries should be controlled by a strict delivery booking system which will distribute deliveries across the week and across working hours. Deliveries should not be accepted outside of their designated time-slot, and such deliveries will be asked to re-book, unless there is capacity to accommodate within the specified loading area. Under no circumstances shall lorries be allowed to lay-up in surrounding roads.

2.4.3 Sufficient time will be given between deliveries to allow for any delays as a result of the delivery vehicle getting stuck in traffic or the loading / unloading taking longer than expected and to avoid any vehicles waiting on the surrounding highway network.

2.4.4 All suppliers will be advised to use the PIE Freight Journey Planner www.freightjourneyplanner.com which is designed to help freight operators plan their route for a specified size of vehicle and identify where to stop legally. The website covers both the UK and Ireland.

2.5 Driver Management & Code of Conduct

2.5.1 Transportation of materials to and from the site should be conducted by HGV vehicles operated by drivers with an in-date Driver Certificate of Professional Competence (CPC) qualification.

2.5.2 Drivers should be fully inducted and enrolled into a code of conduct which outlines how driving duties should be undertaken. The driver's code of conduct should include guidance on the following:

- Required license categories;
- General vehicle operation and highway code;
- Drivers working hours / fatigue management;
- Breakdowns / RTC / Emergencies;
- Use of electronic devices;
- Drug and Alcohol policy; and
- Behavioural expectations.

2.5.3 The items listed above are not exhaustive and are only indicative of the elements that should be included in the driver's code of conduct document.

2.6 Bankspeople

2.6.1 Bankspeople will be deployed to control access and egress to the site, as well as over-seeing manoueveres within the site itself.

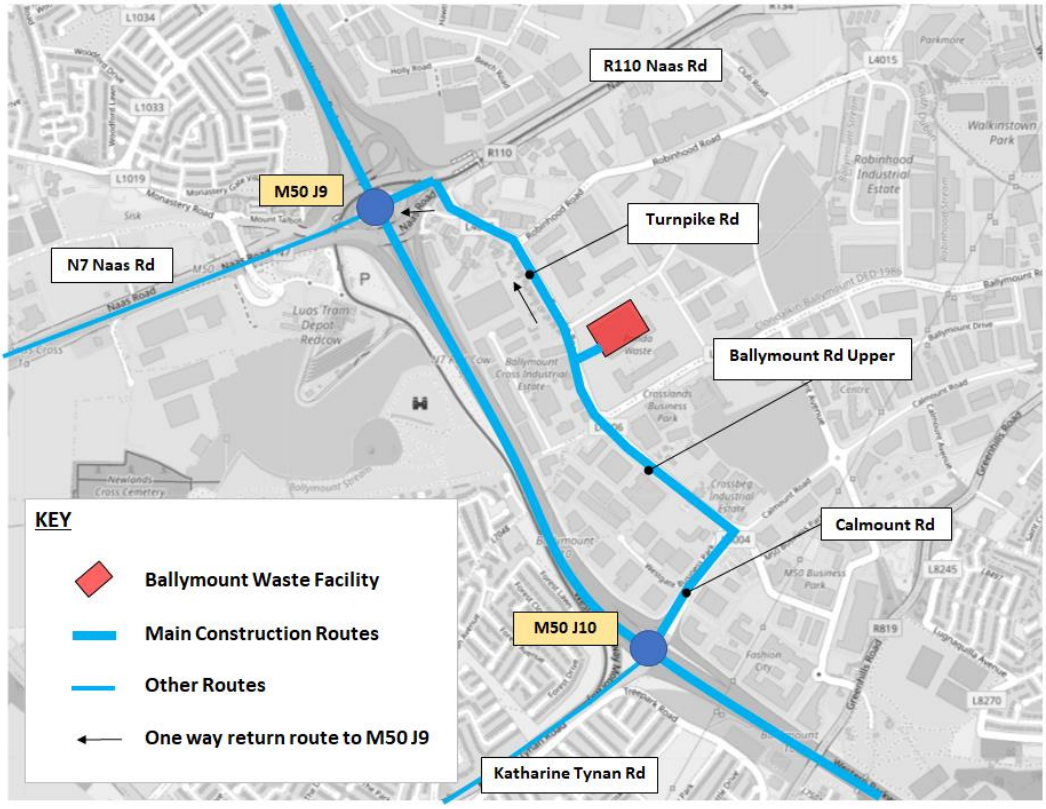
2.7 Contractor Speed Limit

2.7.1 The speed limit currently in operation along Ballymount Road Lower is 50kph. It is considered by SYSTRA that this is suitable for construciton traffic (given the industrial nature of the area), and this will be retained.

2.8 Designated Construction Routes

2.8.1 The site is well-located to ensure that construction traffic travels along suitable routes to the site. **Figure 1** shows the proposed routes for HGV traffic.

Figure 1. Proposed HGV routes during construction



2.8.2 All HGV trips are likely to arrive from either:

- The M50 to the north of J9, and then via J10, Calmount Road and Ballymount Upper. The return journey for these trips will be via Turnpike Road to M50 J9; or
- The M50 to the south of J10, and then via Calmount Road and Ballymount Road, returning the same way.
- A small number of trips may arrive from N7 Naas Road to M50 J9 and from Katherine Tynan Road to M50 J10.

2.8.3 All of the roads listed above already carry high volumes of traffic (and HGVs), and generally pass through industrial / commercial areas. They are therefore considered by SYSTRA to be suitable for construction traffic.

2.8.4 The details of the proposed construction routeing will be agreed with SDCC, prior to commencement of construction works.

2.8.5 Use of the agreed vehicle routes, and delivery protocols, should be accepted by the contractor and should be communicated to all individuals associated with the works.

2.8.6 Any repeated non-compliance of the proposed construction route could result in disciplinary procedures or the termination of the workers / supplier's contract.

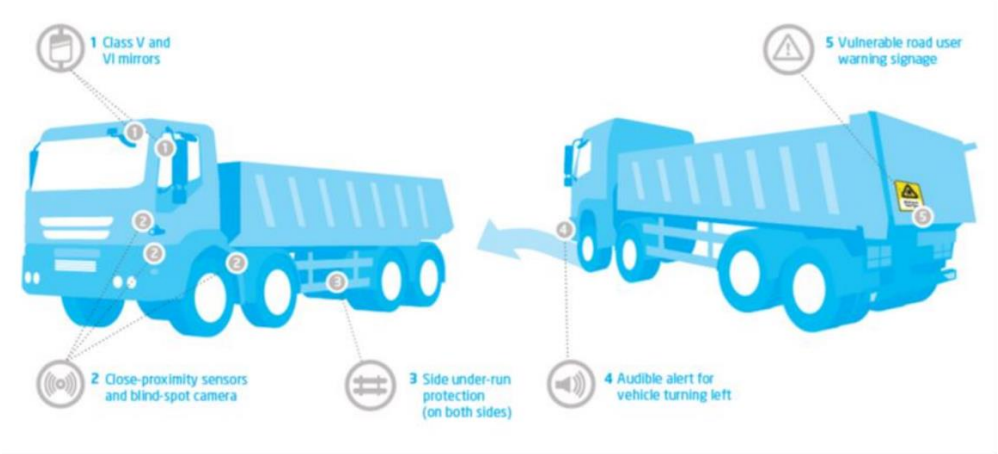
2.9 Vehicle Safety

2.9.1 Heavy goods vehicles associated with the construction of the development must:

- Have Side Guards fitted, unless it can be demonstrated to the reasonable satisfaction of the Employer, that the Lorry will not perform the function for which it was built, if Side Guards are fitted;
- Have a close proximity warning system fitted comprising of a front mounted, rear facing CCTV camera (or Fresnel Lens where this provides a reliable alternative), a Close Proximity Sensor, an in-cab warning device (visual or audible) and an external warning device to make the road user in close proximity aware of the driver's planned manoeuvre;
- Have a Class VI Mirror; and bear prominent signage on the rear of the vehicle to warn cyclists of the dangers of passing the vehicle on the inside.

2.9.2 The Site Manager should ensure that all contractors and fleet operators at the site sign with vehicles over 3.5 tonnes will be required to have the vulnerable road user safety kit, shown in **Figure 2**, fitted.

Figure 2. Safety Measures



2.9.3 The Site Manager should undertake checks of vehicles accessing the site. In the event that a vehicle arrives at the site and is not fitted with the above safety kit then the vehicle may be refused entry and a non-conformance report completed.

2.9.4 The Site Manager / Contractor should ensure that all contractors and fleet operators accessing the site have received the correct level of training and have had driver license checks.

2.10 Measures to Reduce Dust and Debris

2.10.1 The following measures will be implemented at the site to manage dust and dirt effects:

- **A Mechanical Road Sweeper** will be employed at regular intervals as required.
- **Covering of Loads** - Where possible, HGVs carrying material to and from the site will be covered during transportation to minimise wind-blowing materials from being deposited onto the public road network;
- **Dust Suppression** - During periods of particularly dry weather, dust suppression measures such as water spraying will be used on the internal and external access roads where necessary; and
- **Wheel washing** - A wheel washing facility will be present on-site in order to reduce mud and debris being deposited onto the local road network.

2.11 Signage

2.11.1 Temporary construction site signage will be erected on the local road network in the vicinity of the development site to warn people of construction activities and associated construction vehicles. It is suggested that signs would be in place on Ballymount Road Upper, between Calmount Road and Turnpike Road.

2.11.2 The purpose of such signage is to provide driver and pedestrian information and to maintain road safety along the designated construction vehicle routes. The final details and locations of signage (which will primarily be on the trunk road network) between the appointed contractor and SDCC ahead of commencement.

2.11.3 On-site signage will be agreed with the operators of the facility. Indicative signage for use on these routes is indicated by **Figure 11.**

Figure 3. Indicative Warning Signs

2.12 Parking Arrangements

2.12.1 Car parking for the workforce will be provided within the site compound. No overspill will be permitted onto the public road network within the area.

2.12.2 All plant, machinery and vehicles used and stored on site will be parked in a gated compo9und. Where immobilisers are fitted, these will be fully activated. This applies mostly to plant and machinery left on site overnight, weekends and during holiday periods.

2.13 Measures to Maintain Pedestrian Safety

2.13.1 It is acknowledged that there will be an increase in construction vehicle movements on the local road network adjacent to the site. However, the current site already caters for regular HGV movements throughout the week. It is therefore not likely that there will be any new safety risks to pedestrians, or other vulnerable road users. Nevertheless, warning signs will be erected in the vicinity of the site, and any temporary works that affect public routes will be suitably cordoned off, and alternative routes signposted.

2.13.2 Full consideration must always be given to unauthorised persons gaining access to plant and machinery when the site is closed. All plant and machinery shall be kept within the contractor compound area when not in use.

2.13.1 At the outset of construction, the site access point will be gated to ensure that there is no unauthorised access to the construction area by members of the public.

3. IMPLEMENTATION & MONITORING OF THE CTMP

3.1.1 The implementation and monitoring of the CTMP will be the responsibility of the main contractor. These responsibilities include:

- **To provide a primary Point of Contact -** The main contractor will nominate a person to be responsible for the co-ordination of all elements of traffic and transport during the construction of the development. This person will also act as a Liaison Officer with SDCC so that they have a direct point of contact with the main contractor who they may contact for information purposes or to discuss matters pertaining to traffic management or site operation.
- **To monitor and update the CTMP as the project progresses -** The main contractor will review and update the number of site personnel, traffic numbers and the construction programme as the project progresses. Regular updates will be provided to THC with regard to traffic management and any significant changes will be discussed and agreed with THC before implementation. Regular meetings, where required, will be organised for monitoring purposes.
- **To liaise with local communities and businesses -** Contact details will be provided for the liaison officer (telephone number and email address) so that members of the public have an opportunity to ask questions and provide feedback. The main contractor will also make use of the local information channels in order to disseminate information regarding traffic management and other activities.

3.1.2 The main contractor may employ a number of sub-contractors on the site who will fall under the auspices of the CTMP and will have an obligation to adhere to the plan written in to their contracts.

4. SUMMARY

Purpose of the CTMP

4.1.1 Systra Ltd has been commissioned by Starrus Eco Holdings Ltd (Eco) to provide transport and highways advice in relation to the proposed redevelopment of the existing multi-processing facility at Panda Waste, which is located on Ballymount Road Upper, in the Ballymount area of Dublin.

4.1.2 The purpose of the CTMP is to provide details on the proposed traffic management measures and procedures that will be put in place to support the proposed development during the construction phase, and to minimise disruption to other road users and local residents and businesses while maintaining road safety on the surrounding road network.

4.1.3 At this stage, a Framework CTMP has been prepared. The CTMP is intended be a working document that continues to evolve post-planning, once the main contractor has been appointed and more construction details are known.

Site Access

4.1.4 The site is well-located to ensure that construction traffic travels along suitable routes to the site . the new facility will be built within an established site that already supports significant numbers of HGV trips, and will take access from a nearby distributor road. The majority of HGV traffic will arrive from nearby junctions on the M50.

4.1.5 Access to the construction site will be taken from the exisitng access point on Ballymount Road Upper. Signage will be put in place so that approaching vehicles are aware of the Construction Site access, and the presence of turning HGVs.

Mitigation Measures

4.1.6 The main contractor will be responsible for planning and managing deliveries and collections from the site to minimise the impact on the surrounding road network. Deliveries will be planned well in advance, and on-site activities will be co-ordinated so that concentrated peaks in traffic movements on and off the site are avoided.

4.1.7 Proposed management measures include:

- A booking system for deliveries
- Bankspeople to manage all deliveries turning into, and within the site
- Agreed delivery routes from J9 and J10 of the M50.
- Warning signs on Ballymount Road Upper, between Calmount Road and Turnpike Road.
- Measures to reduce dust and debris, including road sweeping, covering of loads and wheel washing.
- Retention of all parking within the site.

Management of the CTMP

4.1.8 The implementation and monitoring of the CTMP will be the responsibility of the main contractor. These responsibilities include:

- Providing a primary Point of Contact for SDCC, local businesses and members of the public.

- Monitoring and updating the CTMP as the project progresses
- Liaising with the local community and businesses.

4.1.9 Discussions with sub-contractors at the tender stages will allow for traffic management policies to be written into the contractual agreements by the main contractor

SYSTRA provides advice on transport, to central, regional and local government, agencies, developers, operators and financiers.

A diverse group of results-oriented people, we are part of a strong team of professionals worldwide. Through client business planning, customer research and strategy development we create solutions that work for real people in the real world.

For more information visit www.systra.co.uk

SYSTRA

APPENDIX 3.3

RWMP

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RESOURCE & WASTE MANAGEMENT PLAN

MATERIALS RECOVERY FACILITY

BALLYMOUNT ROAD UPPER

DUBLIN

Prepared For: -

Starrus Eco Holdings Ltd

Prepared By: -

O'Callaghan Moran & Associates
Unit 15
Melbourne Business Park
Model Farm Road
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November 2023

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APPENDIX 1 DRAWINGS

1. INTRODUCTION

Starrus Eco Holdings Limited (SEHL) is the holding company for Panda and Greenstar. SEHL appointed O'Callaghan Moran & Associates to prepare a Resource and Waste Management Plan (RWMP) for a proposed Materials Recovery Facility (MRF) at Ballymount Road Upper, Ballymount, Dublin 24.

The purpose is to provide information necessary to ensure that the management of construction and demolition (C&D) waste at the site is undertaken in accordance with the current industry standards and waste management regulations.

1.1 Methodology

The approach is based on the Environmental Protection Agency 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects' (2021).

1.2 Relevant Legislation & Guidance

- Protection of the Environment Act 2003, as amended
- The Waste Management Act 1996, as amended
- The Waste Management (Collection Permit) Regulations 2007, (S.I 821) as amended
- European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
- Waste Management (Facility Permit and Registration) Regulations 2007, (S.I No. 821 of 2007) as amended
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014), as amended
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
- Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
- Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
- Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No .419 of 2007) as amended

- European Communities (Transfrontier Shipment of Waste) Regulations

- Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous (2015)

- By-Product A Guidance Note A guide to by-products and submitting a by-product notification under Article 27 of the European Communities (Waste Directive) Regulation 2011 (S.I. No 126 of 2011) (Draft)

- By-Product Notification Form Guidance Version 1 (EPA 2022)

- Guidance on Soil and Stone By-products in the context of article 27 of the European Communities (Waste Directive) Regulations 2011 (EPA 2019)

The RWMP also had regard to the Construction Environmental Management Plan (CEMP) prepared for the development.

1.3 Circular Economy

In 2020, the government published its 'Waste Action Plan for a Circular Economy' to inform and direct national and regional waste planning in Ireland over the coming years. It is action focused to embrace the opportunities in becoming a circular economy. While the thrust of the Plan is to prevent waste arising through reuse, its objectives include ensuring that measures support sustainable economic models (for example by supporting the use of recycled over virgin materials).

In advance of the adoption of a National Waste Management Plan the Regional Waste Management Plans remain in place. It is an objective of this RWMP to meet the requirements of the Eastern and Midland Region Waste Management Plan 2015 – 2021, which in line with the European Union Waste Framework Directive, specifies a mandatory target of 70% of C&D wastes to be prepared for reuse, recycling and material recovery (excluding soil and stones) by 2020.

1.4 RWMP Revision

This RWMP will be revised prior to the start of construction to:

- Take consideration of the conditions of the planning permission.

- Identify the members of the Design Team and specify their roles and responsibilities.

- Make provision for the waste prevention and resource recovery measures identified in the detailed design stage.

- Include a post design resource and waste inventory of all residual resources, and

- Identify the roles and responsibilities of the Construction Management Team, including materials procurement.

2. DEVELOPMENT DESCRIPTION

The site encompasses approximately 1.18 hectares and consists of one materials handling building and one office building. The development will involve the destruction of the current buildings and the construction of a new facility consisting of a single waste handling building (4,710m^2) including staff welfare facilities and a small site office. The proposed layout is shown on Drawing No. 221244-ORS-Z0-00-DR-AR-203 in Appendix 1 and will comprise one materials handling building, an electricity substation and two weighbridges.

2.1 Site Layout

The design of the site layout took into consideration the need to:

- Avoid excessive temporary works, e.g. site roads, site offices/foundations, and
- Protect the local natural environment and biodiversity from any adverse impacts associated with the sorting, segregation, storage and transport of construction stage waste.

2.2 Building Design & Layout

The building elevations and sections are shown on Drawing No 221244-ORS-Z0-00-DR-AR-206 in Appendix 1. The building will be a steel portal frame structure, with external preformed and profile sheeting on the walls and low pitch roof cladding. It will be 13.3m above ground level (77.7mOD) to the upper ridge level. Solar panels will be installed on the southern pitch of the roof. The building floor plan is shown on Drawing No 221244-ORS-Z0-00-DR-AR-203 in Appendix 1.

2.3 Services

2.3.1 Water Supply

Water for use in staff welfare facilities will be obtained from mains supply. Rainwater from the roof will be harvested for use as grey water in the staff toilets.

2.3.2 Wastewater

Sanitary wastewater from the staff toilets and from the wheel cleaning in the MRF will discharge to Uisce Eireann foul sewer that runs along the Ballymount Road Upper.

2.3.3 Surface Water Drainage

Rainwater run-off from the building roofs will be harvested for on-site use. Run—off from the yards will be collected and directed to separate on-site SuDs systems.

2.3.4 Electricity Supply

There will be a connection to the national grid and an electrical substation will be provided in the south east of the site. The electricity from the roof mounted solar panels will be used directly on site.

2.4 Development Phases

The demolition and construction will be carried out in one phase.

3. DETAILED DESIGN STAGE

3.1 Design Team

The Design Team will include, but not be limited, to:

- SEHL representative
- Architect
- Civil Engineer
- Quantity Surveyor
- Resource Manager

The roles and responsibilities each team member will be documented.

3.2 Reuse and Recycling Initiatives

3.2.1 Reuse of Existing Site Assets

The site consists of one materials handling building and one office building. The site is currently connected to the Uisce Eireann Water mains and storm water system. The current materials handling building is not large enough to handle the increase in tonnage per annum and the office building is not required. Therefore both of these buildings will be demolished prior to the construction of the new materials handling building.

3.2.2 Article 27 By-Products

Samples of the subsoils will be collected and analysed to determine the baseline soil conditions and to determine if any subsoils that have to be removed from the site in the construction stage meet the criteria specified in the EPA's Article 27 Guidance on Soil and Stone By-products (2021).

3.2.3 Recycled Aggregates

The EPA is currently in the process of introducing a National End of Waste Protocol for End of Waste Recycled Aggregates which is expected to be adopted before the detailed design of the development begins. It will be a detailed design objective to select recycled aggregates that meet the required geotechnical requirements rather than source over natural aggregates.

The likely construction and demolition waste arising at the proposed development will be assessed at the detailed design stage for their potential to be recycled into aggregates that meet End of Waste Status. Where there is such potential appropriate handling and storage measures will be put in place to minimise the risk of cross contamination with non-recyclable materials.

3.3 Green Procurement Initiatives

The Design Team will endeavour to develop material specifications flexible enough to allow for the variations in reclaimed materials. The Resource Manager will have expert knowledge in waste prevention and will seek to identify development specific methods of waste prevention and minimisation, including reducing the amounts of packaging materials delivered to the site during the works.

3.4 Off Site Construction Initiatives

The Design Team will evaluate the benefits of off-site manufacturing to reduce wastes arising at the development site. Given the nature of the development modular buildings are not an option, but the use of pre-cast structural concrete panels would reduce the residual volumes of concrete blocks, mortars, plaster board arising.

3.5 Materials Optimisation Initiatives

The Design Team will endeavour to simplify the design, layout, building form, structural system, building services and construction sequencing where practical and will investigate the use of standardised sizes for certain materials to help reduce the amount of offcuts produced on site.

3.6 Flexibility and Deconstruction Initiatives

The objective is to ensure that all structures contain materials that can be recycled and, where practicable, easily disassembled during maintenance and refurbishment.

4. KEY MATERIALS AND QUANTITIES

Preliminary estimates of the main demolition materials arsing and construction materials that will be used are given in Tables 4.1 and 4.2. These will be updated in the detailed design stage.

Table 4-1 Demolition Materials

Demolition	
Material	**Est. Tonnage**
Metals - mixed ferrous, aluminium cladding, high grade stainless steel, low grade stainless steel	315
Timber	10
Glass	6
Hard Plastics	1
Waste Electrical and Electronic Equipment (WEEE)	3
Soil and Stone	200
Concrete, cement and Blocks	765
Asphalt/Bitumen Material	1005
Foil Insulation	5

Table 4-2 Construction Materials

Demolition	
Material	**Est. Tonnage**
Metals - mixed ferrous, aluminium cladding, high grade stainless steel, low grade stainless steel	315
Timber	10
Glass	6
Hard Plastics	1
Waste Electrical and Electronic Equipment (WEEE)	3
Soil and Stone	200
Concrete, cement and Blocks	765
Asphalt/Bitumen Material	1005
Foil Insulation	5

5. PRELIMINARY CONSTRUCTION PROGRAMME

5.1 Construction Programme

The works will comprise the following;

- Set up site office and contractors compound;
- Securing the site and erecting signage;
- Demolition of the existing buildings and paved areas;
- Sorting of demolition materials;
- Setting out;
- Stripping and stockpiling of topsoils;
- Provision of hardstand for delivery vehicles for unloading and turning;
- Provision of water, wastewater and stormwater services;
- Building and tank construction and paving, and
- Landscaping

5.2 Construction Schedule

The construction programme will be completed in three stages.

Stage 1 – Site Set Up

This will involve the set-up of site offices and contractors compound, provision of hardstand for vehicles, securing the site and erection of signage and will take one week.

Stage 2 – Site Clearance and Setting Out

This stage will involve the demolition of the current buildings and hardstanding, stripping and stockpiling of topsoils and grading to formation level and will take four weeks.

Stage 3 –Construction of internal roads and yards and the construction and fit out of the building along with the ancillary services and landscaping. This will be completed in approximately 14 months.

6. SITE MANAGEMENT

6.1 Waste Types

Wastes generated will include broken concrete blocks/tiles/ceramics; timber and hard plastic off-cuts; metal (aluminium and steel); plasterboard, electrical wire, batteries and damaged equipment; packaging (cardboard, plastic, timber); empty paint tins and adhesive containers; insulation materials; canteen waste from the welfare facilities; waste oil and filters from mobile plant.

At the time the construction works begin if there are no developments authorised to accept Article 27 Notified Soils and Stone within economic transport distances of the site then the soil and stone will be classified as a waste and sent to authorised soil recovery facilities

The waste types are listed in Table 6.1 which also includes the List of Waste (LoW) code. This is not an exhaustive list and will be revised at the detailed design stage.

Table 6.1

Waste Type	LoW Code
Concrete, bricks, tiles, ceramics	17 01 01-17 01 03 03 & 17 01 07
Wood, glass and plastic	17 02 01-03
Soil and Stone	17 05 03
Bituminous mixtures	17 03 02
Metals (including their alloys)	17 04 01-07
Gypsum-based construction material	17 08 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Electrical and electronic components	20 01 35 20 01 36
Batteries and accumulators	20 01 33 20 01 34
Oil	13 01 10, 13 03 05
Chemicals (e.g. solvents, paints, adhesives)	20 01 13 , 20 01 19, 20 01 27
Insulation materials	17 06 04

All surplus clean soil and stone excavated to achieve formation levels and for foundations and services will be sent off-site for either reuse or recovery. Soil and stone impacted by accidental spills of polluting substances e.g. oils will be sent off-site to authorised waste management facilities.

Pending the completion of the detailed design of the development, which will include the selection of materials to 'design out' waste and reuse and recycling initiatives and the confirmation of the construction methodologies, it is not possible to estimate with any level of accuracy the quantities of C&D waste that will be generated.

6.2 Resource & Waste Manager

Given the scale of the development the Main Contractor will nominate an experienced Construction Stage Resource & Waste Manager who will be responsible for the appropriate segregation and storage of all waste arising in the construction stage, including wastes from the staff welfare facilities.

6.2.1 Regulatory Compliance

The Resource & Waste Manager shall ensure that all wastes arising in the construction stage are sent to waste facilities that are authorised under the Waste Management Act 1996, as amended and/or the Environmental Protection Act 1992, as amended and hold up to date authorisations that approve the acceptance of the specific waste types. These authorisations include:

- Industrial Emissions Licences Waste Licences issued by the EPA, and
- Waste Facility Permits and Certificates of Registration issued by a local authority.

The Resource & Waste Manager shall ensure that all soil and stone meeting the Article 27 By-Product Criteria are only sent to development sites that have planning permission to accept the materials.

6.2.2 Training

The Resource & Waste Manager shall be responsible for instructing construction staff on the appropriate segregation and storage practices for the different waste types. This may be provided as part of general site training needs such as site induction, health and safety awareness and 'tool box talks'.

6.2.3 Records

The Resource & Waste Manager shall be responsible for maintaining the following records of all wastes sent of site

- Details of the waste collector, including the waste collection company name, vehicle registration number and date the wastes were collected.
- Details of the waste management facility to which the materials were sent, including weighbridge records that detail the waste collection company and vehicle registration and quantity of waste accepted.

The Resource & Waste Manager shall be responsible for maintaining the following records of all Article 27 Notified Soil and Stones sent off-site site

- Details of the haulier, vehicle registration number the date the soils were collected and estimates of the quantities.
- Details of the development site to which the materials were sent, including weighbridge records that detail the waste collection company and vehicle registration and quantity of waste accepted.

6.3 On-Site Materials Management

Appropriately sized skips will be provided by a waste collector who holds an up to date Waste Collection Permit from the National Waste Collection Permit Office (NWCPO), which authorises the collection of the waste types that will arise during the construction stage. Dedicated skips will be provided for:

- Concrete rubble, bricks and tiles
- Plasterboard
- Hard plastic off-cuts
- Timber off-cuts
- Metal off-cuts and rebar
- Glass
- Cardboard and plastic packaging
- Non-recyclable packaging (e.g. polystyrene)
- Waste Electrical and Electronic Equipment (wiring, batteries)
- Empty paint tins, adhesive containers and oil cans

Separate wheelie bins will be provided for food waste, mixed dry recyclables and residual waste for wastes arising at staff welfare facilities.

The skips will be located at strategic locations around the site, as decided by the Resource & Waste Manager, in areas that are remote from water courses. The wheelie bins will be stored adjacent to the construction workers welfare facilities.

Signage will be provided that informs the site staff of the waste types that can be placed in each skip.

6.3.1 Article 27 Soil & Stone By-Products

Soil and stone meeting the Article 27 Notification Criteria will be stored in designated stockpile area pending consignment to development sites for reuse.

6.3.2 Hazardous Waste Management

The paint tins, adhesive containers and oil cans will be classified as hazardous waste and will only be placed in a water tight dedicated skip.

Waste oils arising from routine plant maintenance shall be stored in drums or in an enclosed storage unit in the Contactor's Compound.

6.3.3 Inspections/Audits

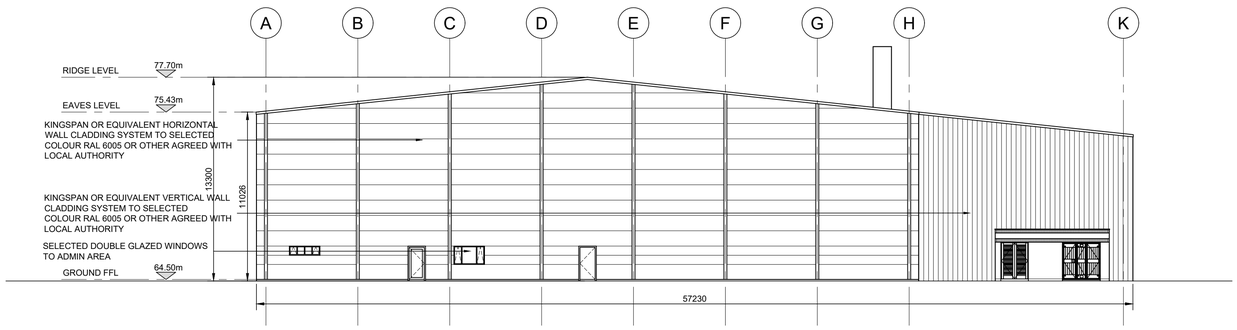
The Resource & Waste Manager will be responsible for regularly inspecting the skips and bins to

- Ensure they are being used appropriately
- Remove non-conforming wastes, and
- That they are removed from the site as required to prevent spillage.

APPENDIX

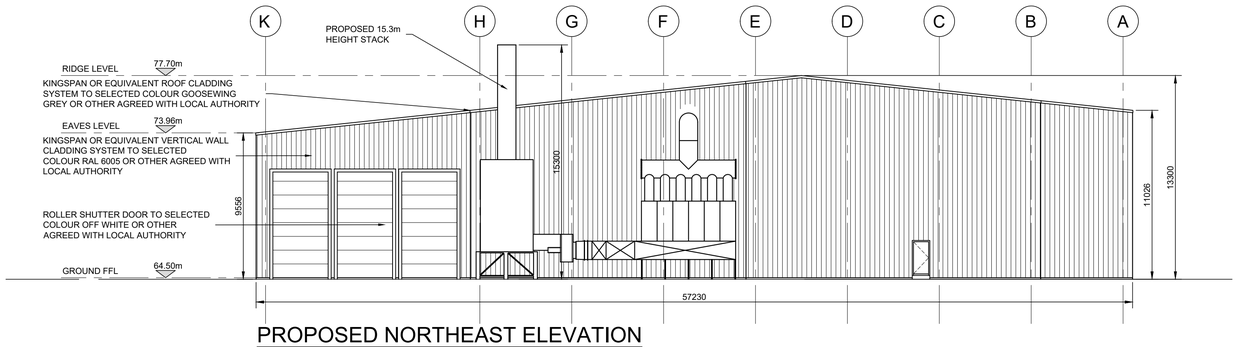
DRAWINGS

A1



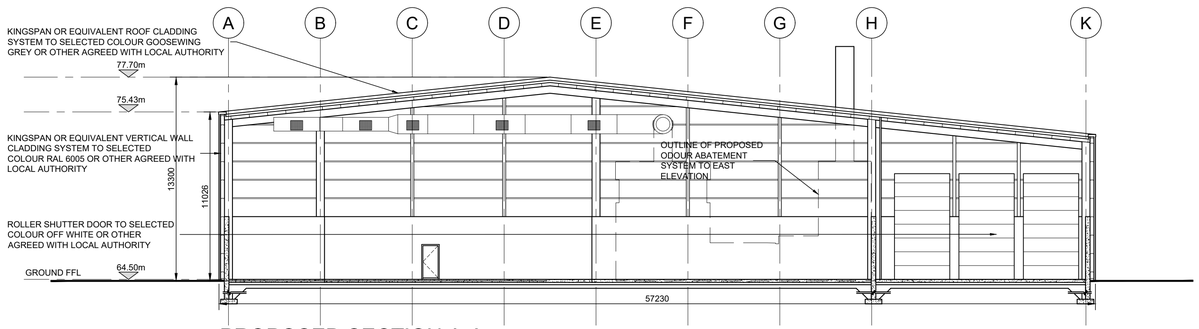
PROPOSED SOUTHWEST ELEVATION

SCALE 1:200



PROPOSED NORTHEAST ELEVATION

SCALE 1:200



PROPOSED SECTION A-A

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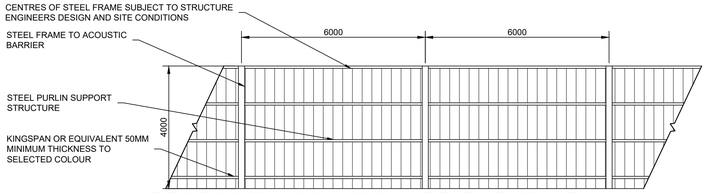

PROPOSED ACOUSTIC BARRIER ELEVATION

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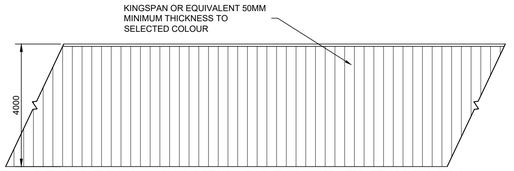

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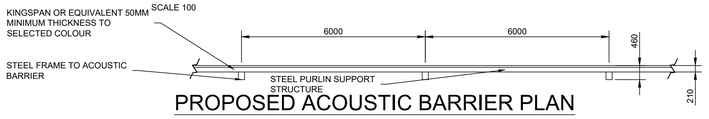
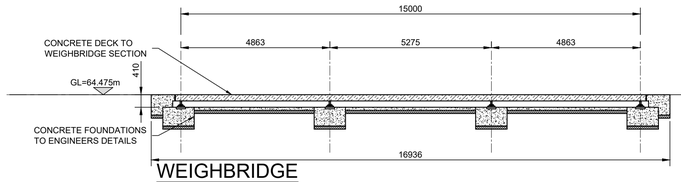


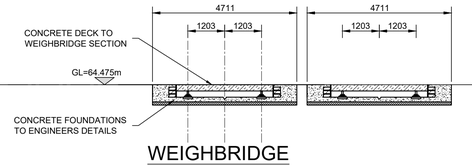
PROPOSED ACOUSTIC BARRIER PLAN

SCALE 100



WEIGHBRIDGE

SCALE 100



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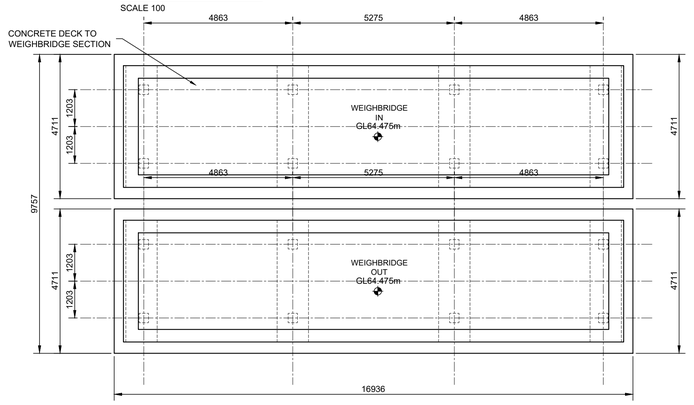

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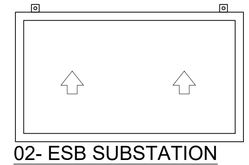

02- ESB SUBSTATION ROOF PLAN

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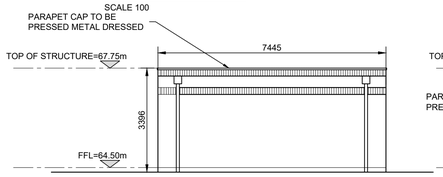

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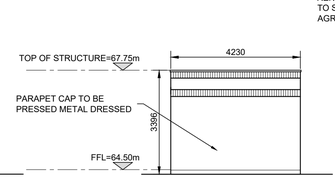

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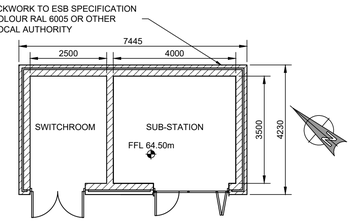

ESB SUBSTATION FLOOR PLAN

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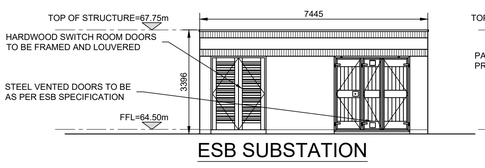
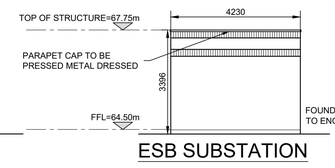


ESB SUBSTATION SOUTHWEST

SCALE 1:100



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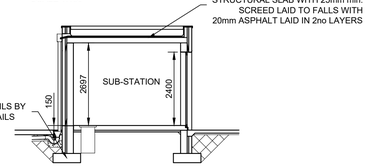

ESB SUBSTATION TYPICAL SECTION

SCALE 1:100

INFORMATION

Figured dimension only to be taken from this drawing.
All dimensions to be checked on site.
Consultants to be informed immediately of any discrepancies before work proceeds.

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	10/05/2023	ISSUED FOR COMMENT	CB	CB
P02	12/06/2023	SITE LAYOUT UPDATED	CB	CB
P03	12/07/2023	BUILDING AND SITE LAYOUT UPDATED	CB	CB
P04	28/08/2023	BUILDING LAYOUT UPDATED	CB	CB
P05	02/10/2023	ISSUED FOR COMMENT	CB	CB
P06	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24
TITLE:	PROPOSED ELEVATIONS, ACOUSTIC BARRIER, WEIGHBRIDGE & SUBSTATION

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
CB	CB	OD	221244	P06
DATE: 01/12/2023	SCALE: 1:200		DRAWING NO: 221244-ORS-Z1-ZZ-DR-AR-206	

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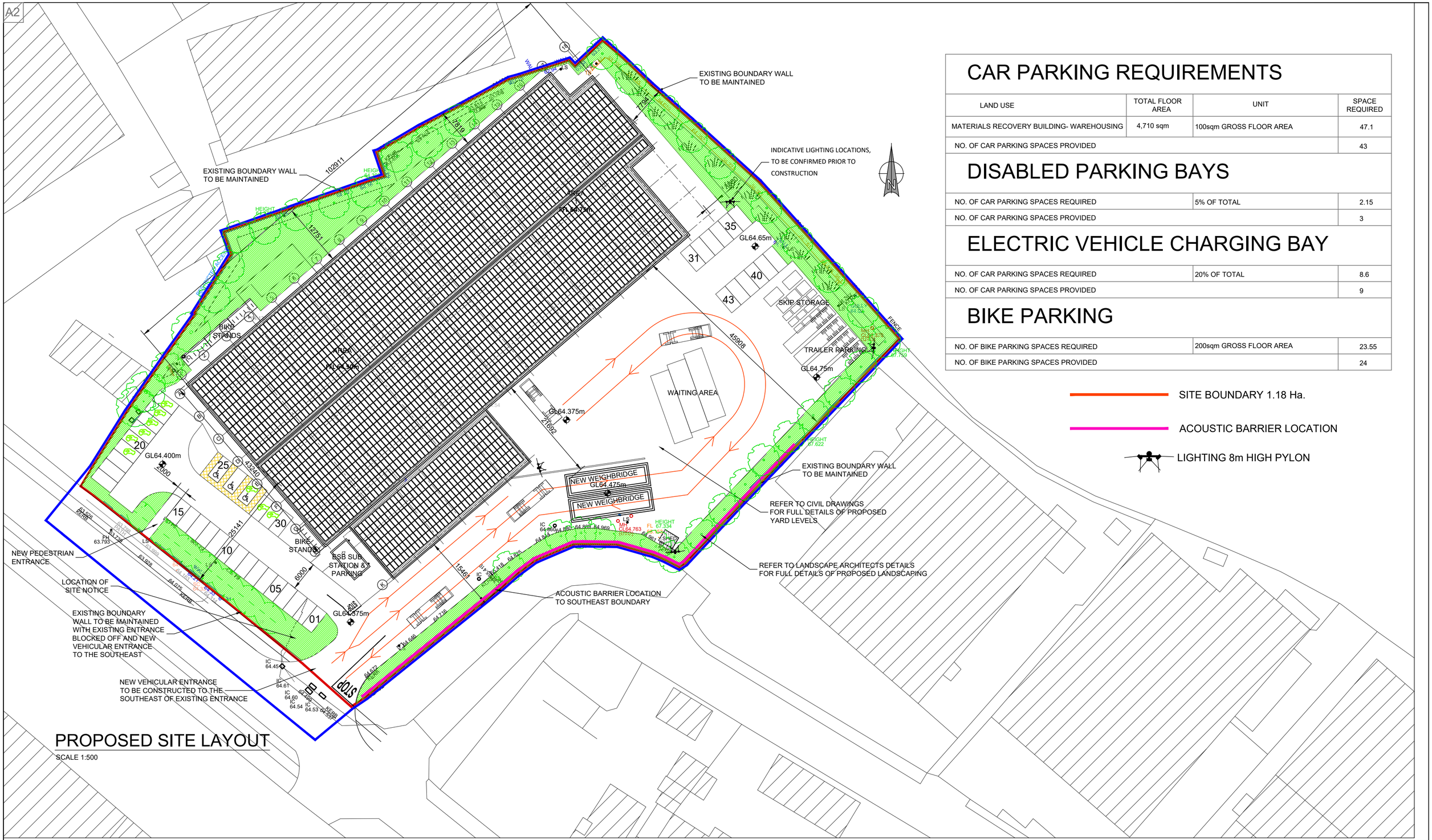

PROPOSED SITE LAYOUT

SCALE 1:500

CAR PARKING REQUIREMENTS

LAND USE	TOTAL FLOOR AREA	UNIT	SPACE REQUIRED
MATERIALS RECOVERY BUILDING- WAREHOUSING	4,710 sqm	100sqm GROSS FLOOR AREA	47.1
NO. OF CAR PARKING SPACES PROVIDED			43

DISABLED PARKING BAYS

NO. OF CAR PARKING SPACES REQUIRED	5% OF TOTAL	2.15
NO. OF CAR PARKING SPACES PROVIDED		3

ELECTRIC VEHICLE CHARGING BAY

NO. OF CAR PARKING SPACES REQUIRED	20% OF TOTAL	8.6
NO. OF CAR PARKING SPACES PROVIDED		9

BIKE PARKING

NO. OF BIKE PARKING SPACES REQUIRED	200sqm GROSS FLOOR AREA	23.55
NO. OF BIKE PARKING SPACES PROVIDED		24

SITE BOUNDARY 1.18 Ha.

ACOUSTIC BARRIER LOCATION

LIGHTING 8m HIGH PYLON

INFORMATION

Figured dimension only to be taken from this drawing.
All dimensions to be checked on site.
Consultants to be informed immediately of any discrepancies before work proceeds.

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
P01	10/05/2023	ISSUED FOR COMMENT	CB	CB
P02	12/06/2023	SITE LAYOUT UPDATED	CB	CB
P03	12/07/2023	BUILDING AND SITE LAYOUT UPDATED	CB	CB
P04	28/08/2023	BUILDING LAYOUT UPDATED	CB	CB
P05	02/10/2023	ISSUED FOR COMMENT	CB	CB
P06	01/12/2023	ISSUED FOR PLANNING	CB	CB

CLIENT:	STARRUS ECO HOLDINGS LIMITED (SEHL)
PROJECT:	BALLYMOUNT ROAD UPPER, DUBLIN 24
TITLE:	PROPOSED SITE LAYOUT

DRAWN:	CHECKED:	APPROVED:	JOB NO:	REV:
CB	CB	OD	221244	P06
DATE: 01/12/2023	SCALE: 1:500		DRAWING NO: 221244-ORS-Z0-00-DR-AR-203	

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APPENDIX 4.1

BREF Assessment

BAT 1. In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS). The scope (e.g. level of detail) and nature of the EMS (e.g. standardised or non-standardised) will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have (determined also by the type and amount of wastes processed).

The EPA licence will specify the scope of the EMS that must be implemented at the MRF. In addition details of the accredited EMS that will be implemented in the operational stage are in Section 3.6 of the EIAR.

BAT 2. In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques given below.

(a) Set up and implement waste characterisation and pre-acceptance procedures/

(b) Set up and implement waste acceptance procedures

Waste characterisation and pre-acceptance procedures will be put in place, as described in Section 3.9 of the EIAR. .

(c) Set up and implement a waste tracking system and inventory

The EPA licence will require detailed records of each waste load accepted and dispatched from the installation as described in Sections 3.9 of the EIAR.

(d) Set up and implement an output quality management system

The objective of the MRF is to maximise the recycling and recovery of incoming materials and documented operational procedure will be prepared that demonstrate how this objective will be achieved. The procedures will be an integral part of the EMS.

(e) Ensure waste segregation

(f) Ensure waste compatibility prior to mixing or blending of waste

(g) Sort incoming solid waste

Upon arrival all wastes will be inspected and then directed to designated processing/storage areas. The current operational procedures will revised prepared prior to the acceptance of the additional waste types to ensure that appropriate compatibility and blending requirements are implemented.

BAT 3. In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the environmental management system (see BAT 1).

The scope (e.g. level of detail) and nature of the inventory is generally related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have (determined also by the type and amount of wastes processed).

An inventory of all emissions from the MRF is included in the EIAR

BAT 4. In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given below*:*

(a) Optimised storage location
(b) Adequate storage capacity
(c) Safe storage operation
(d) Separate area for storage and handling of packaged hazardous waste.

The current Materials and Waste Storage Plan will be revised as described in Section 3.12 of the EIAR

BAT 5. In order to reduce the environmental risk associated with the handling and transfer of waste BAT is to set up and implement handling and transfer procedures.

Handling and transfer procedures have been prepared as part of the implementation of the current EMS.

BAT 6. For relevant emissions to water as identified by the inventory of waste water streams (see BAT 3), BAT is to monitor key process parameters (e.g. waste water flow, pH, temperature, conductivity, BOD) at key locations (e.g. at the inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).

Not applicable, as there will no wastewater emissions to water. Note in this instance emissions refer to process wastewater and not storm water.

BAT 7. BAT is to monitor emissions to water with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Not applicable as there will no emissions to water.

BAT 8. BAT is to monitor channelled emissions to air with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality*.*

The odour control system will be a channelled emission to air and the monitoring requirements will be set in the EPA licence.

BAT 9. BAT is to monitor diffuse emissions of organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPs with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques given below.

Not applicable, as solvents will not be regenerated or treated at the MRF

BAT 10. BAT is to periodically monitor odour emissions.

The applicability is restricted to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.

Odour monitoring will be carried out as referenced in Section 10.9.2 of the EIAR

BAT 11. BAT is to monitor the annual consumption of water, energy and raw materials as well as the annual generation of residues and wastewater, with a frequency of at least once per year.

The annual consumption of water, raw material as well as the generation of residues and wastewater will be monitored and reported in the Annual Environmental Report (AER). Wastewater emissions to the foul sewer will be monitored.

BAT 12. In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan as part of the environmental management system (see BAT 1).

The applicability is restricted to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.

An odour management plan will be been prepared as described in Section 10.8.3.3 of the EIAR.

BAT 13. In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques given below

(a) Minimising residence times

(b) Using chemical treatment

(c) Optimising aerobic treatment

Refer to BAT 12

BAT 14. In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour BAT is to use an appropriate combination of the techniques given below.

Refer to BAT 12 and Section 10.8.3.4 of the EIAR

***BAT 15. BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques given below*.**

Not Applicable.

BAT 16. In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given below.

Not Applicable.

BAT 17. In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see *BAT 1)*

The applicability is restricted to cases where a noise or vibration nuisance at sensitive receptors is expected and/or has been substantiated.

Although the development will not cause significant noise or vibration nuisance at a sensitive receptor the best practice measures described in Section 10.8.3.2 of the EIAR will be implemented.

BAT 18. In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given below.

(a) Appropriate location of equipment and buildings

All waste handling and processing will be carried out on inside the buildings.

BAT 19. In order to optimise water consumption, to reduce the volume of waste water generated and to prevent or, where that is not practicable, to reduce emissions to soil and water BAT is to use an appropriate combination of techniques.

All operational areas will be paved. The permeable paving the car park is designed to filter out hydrocarbons. Rainwater from operational yards will pass through an oil interceptor before discharging to the Uisce Eireann storm sewer.

BAT 20. In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of techniques.

- ***Table 6.1* BAT-associated emission levels (BAT-AELs) for direct discharges to a receiving water body**

Not applicable as there will not be a direct discharge of a treated wastewater to a receiving water body.

- **Table 6.2: BAT-associated emission levels (BAT-AELs) for indirect discharges to a receiving water body**

Not applicable, as there is no indirect discharge of treated wastewater to a receiving water body.

BAT 21. In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the specified techniques as part of the accident management plan (see BAT 1)

(a) Protection measures
(b) Management of incidental /accidental emissions
(c) Incident/accident registration and assessment system.

The mitigation measures that will be implemented to prevent or limit the environmental consequences of accidents and incidents are described in the relevant Chapters of the EIAR. As described in Sections 3.16 and 3.17of the EIAR the current Accident Prevention Policy and Emergency Response Procedure will be revised.

BAT 22. In order to use materials efficiently, BAT is to substitute materials with waste.

C&D waste will be processed to produced recycled aggregates that meet End of Waste criteria meaning they will replace quarry won materials.

BAT 23. In order to use energy efficiently, BAT is to use both of the following techniques

(a) Energy efficiency plan

(b) Energy balance record

The energy efficiency measures that will be provided are described in Section 3.15 of the EIAR.

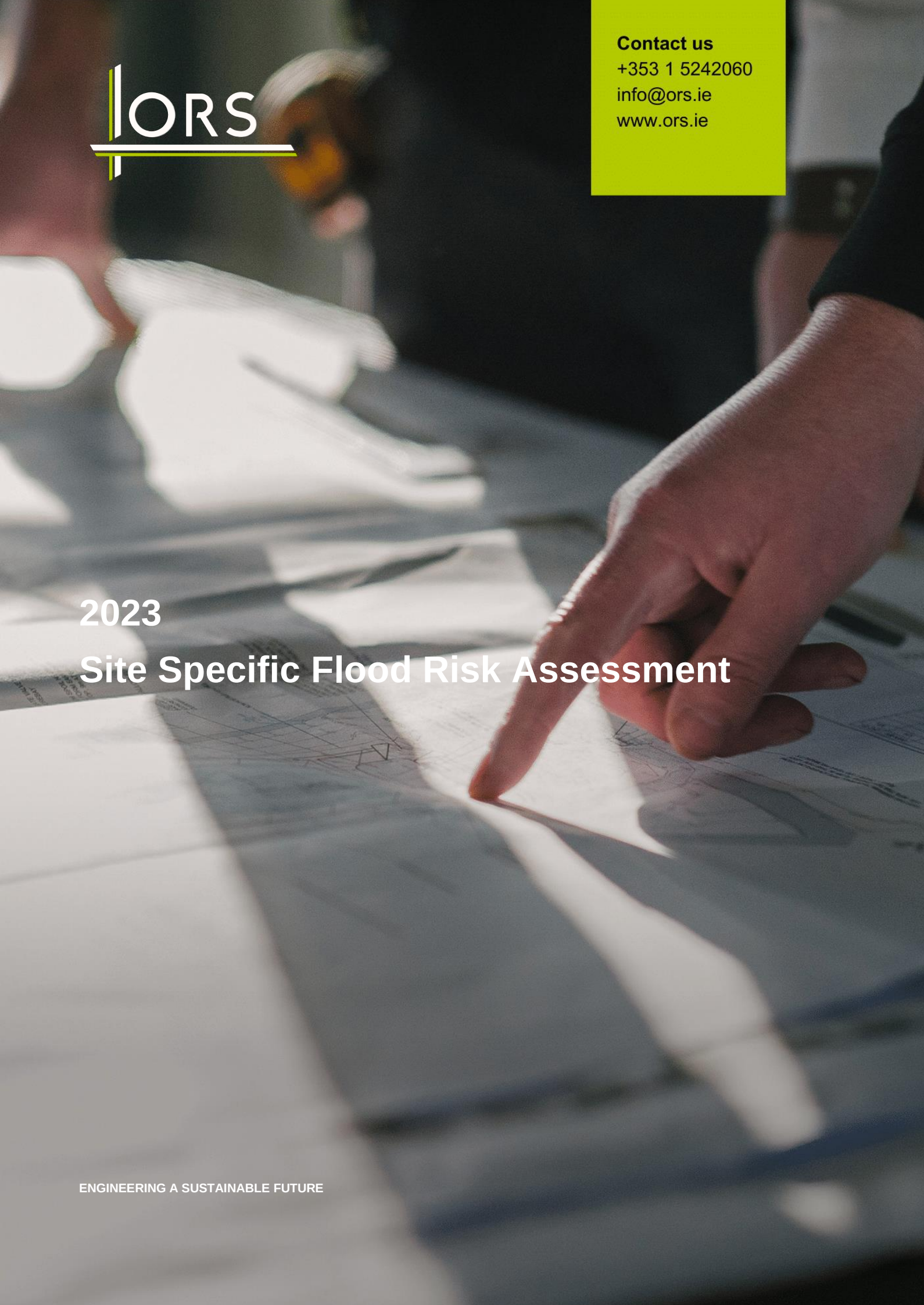
BAT 24. In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging as part of the residues management plan (see BAT 1).

Some applicability restrictions derive from the risk of contamination of the waste posed by the reused packaging.

It is an objective to achieve a 98% recovery and recycling rate for all of the wastes accepted at the MRF.

APPENDIX 7.1

Flood Risk Assessment



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2023
Site Specific Flood Risk Assessment

ENGINEERING A SUSTAINABLE FUTURE

Flood Risk Assessment

Proposed development at 24 Ballymount Rd Upper, Ballymount, Dublin, D24 E097.

Document Control Sheet

Client:	Starrus Eco Holdings Ltd.
Document No:	221244-ORS-XX-XX-RP-EN-13d-001

Revision	Status	Author:	Reviewed by:	Approved By:	Issue Date
P01	**S2**	**OD**	**AK**	**JB**	**26/10/2023**
P02	**S2**	**OD**	**AK**	**JB**	**27/11/2023**

Table of Contents

1 Introduction

1.1 Background

ORS have been commissioned by Starrus Eco Holdings Ltd., to prepare a Site-Specific Flood Risk Assessment (SSFRA) Report to accompany a planning application for a proposed development on a site at 24 Ballymount Rd Upper, Ballymount, Dublin, D24 E097. This report has been prepared to assess the flood risk to the proposed site location and adjacent lands.

1.2 Scope of Report

This report outlines the findings of the SSFRA carried out for the proposed development and takes cognisance of the following relevant guidelines and legislation.

- Department of the Environment Heritage and Local Government (DEHLG) and the Office of Public Works (OPW) (November 2009) Guidelines for Planning Authorities: The Planning system and Flood Risk Management Guidelines for Planning Authorities.

- The Planning and Development Act 2000.

The aforementioned guidelines introduce mechanisms for the incorporation of flood risk identification, assessment, and management into the planning process. This report has been prepared in accordance with these guidelines.

1.3 Proposed Development

The development will consist of: demolition of all existing buildings, including a c. 1,648 sq m one-storey material recovery building (max height c. 10.9 m) and a c. 612 sq m two-storey administration office building (max height c. 8.2 m); construction of a 4,710 sq m one-storey material recovery building (max height 13.3 m) (the material recovery building will inter alia include an ancillary administration reception office, canteen, WCs, and storage); and a change of use (intensification) to increase the annual waste acceptance rate from 150,000 tonnes to 350,000 tonnes per year so as to expand the facility's recycling/recovery capacity.

The development will also consist of: relocation of the facility's entrance some 25 m southeast; redirection of refuse vehicle route; relocation of weighbridges and waiting area in the path of the revised refuse vehicle route; relocation of skip storage and trailer parking to the northeast of the site; installation of an odour control unit to the rear (eastern corner) of the material recovery building (the unit will include an external flu 15.3 m in height above ground); construction of an ESB substation (max height 3.4 m); reduction in, and rearrangement of, car parking provision (from some 70 No. to 43 No. total car parking spaces, including the provision of 9 No. EV car parking spaces and 3 No. disabled car parking spaces (1 No. being a disabled and EV car parking space)); provision of 24 No. bicycle stands; a 4 m high acoustic wall located along the eastern boundary of the site; hard and soft landscaping; boundary treatments; tree removal; tree planting; interim site hoarding; lighting; site services; and all ancillary works and services necessary to facilitate construction and operation.

The current Ballymount MRF operates under an Industrial Emissions Licence issued by the EPA that authorises the acceptance of 150,000 tonnes of waste annually. It encompasses 1.18 ha. There are 2 weighbridges at the entrance, with car parking to the east and west. There are

two adjoining waste processing buildings (1,610m^2 in total) the north of the site, with an office block (612m^2) in the southwest. The office houses the staff of a number of the Beauparc group companies.

The development will see the demolition of the existing processing sheds and offices and the expansion of waste processing operations on the site into a single building. The office functions will be relocated to Beauparc's company head office in Fassaroe.

A single 4,710m^2 industrial building will be built on the site, complete with staff welfare facilities and a small site office and weighbridge. The annual waste intake will increase to 350,000 tonnes. All waste processing will be carried out inside the building. A negative air extraction and dust and odour control units will be installed. A modern fire detection and extinguishing system will be provided.

As the annual waste intake will exceed 100,000 the development is considered to be Strategic Infrastructure Development (SID) and a planning application will be made directly to An Bord Pleanála.

1.4 Proposed Site Location

The proposed development site is located at Panda Waste Processing Facility at 24 Ballymount Rd Upper, Ballymount, Dublin, D24 E097 in the administrative jurisdiction of South Dublin County Council (SDCC).

The site has a total area of approximately 1.18ha and is located on Ballymount Road Upper. The proposed site is bounded to the east and west by industrial units, to the south by Ballymount Road Upper and to the north by a greenfield area.

A topographical survey of the site was undertaken in October 2023. The site slopes gradually from southeast to northwest from approximately 64.987m OD in the southeast to 63.495m OD in the northwest. There are localised high and low points on the site. A copy of the topographical survey is included in **Appendix A**.

The proposed site location is illustrated in **Figure 1.4** below.

Figure 1.4: Proposed Site Location

1.5 Proposed Site Layout

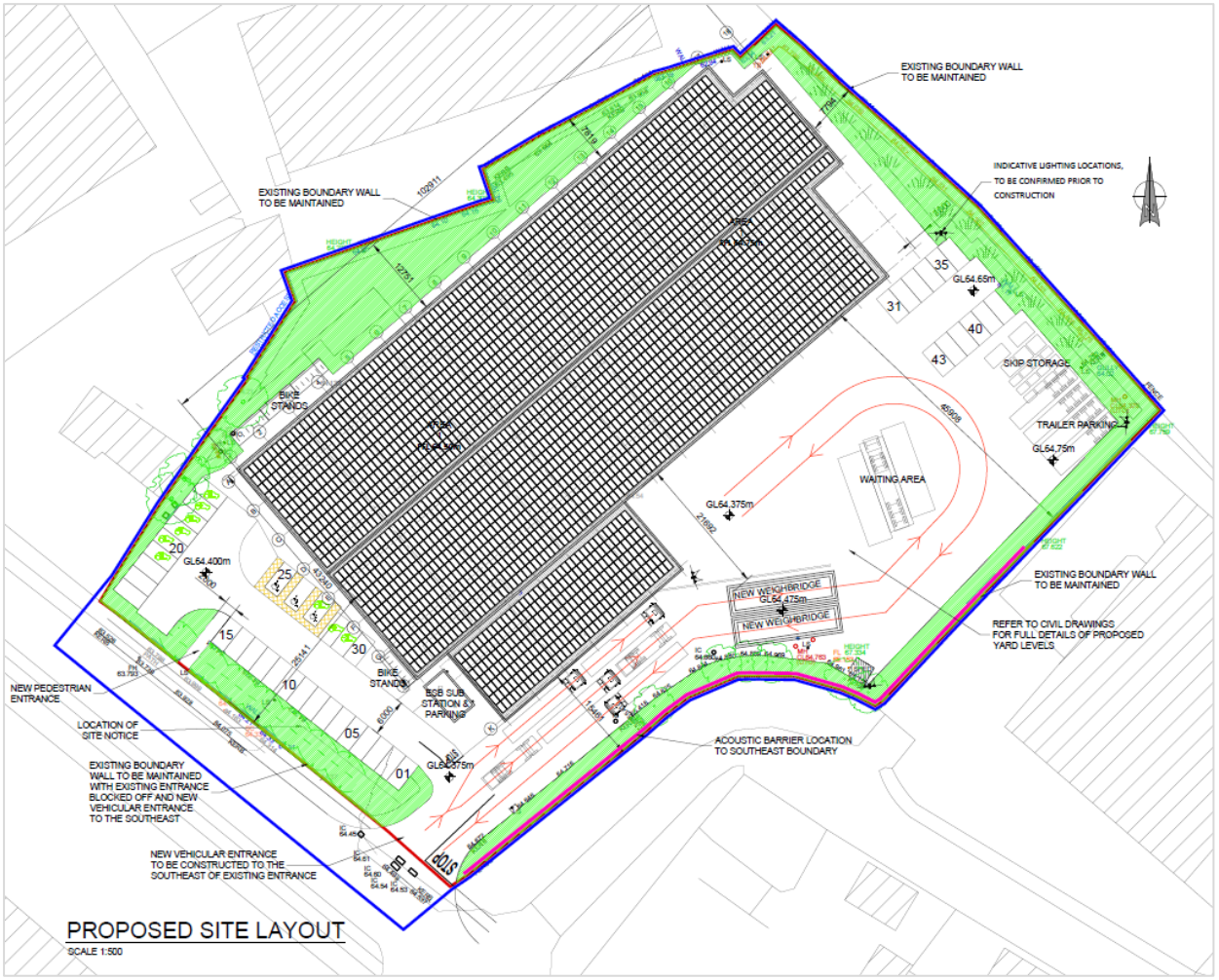


Figure 1.5: Proposed Site Layout

2 Risk Assessment Process

2.1 Definition of Flood Risk

Flood risk is an expression of the combination of the flood probability or likelihood and the magnitude of the potential consequences of the flood event. It is normally expressed in terms of the following relationship:

Flood Risk = Likelihood of flooding x Consequences of flooding

The likelihood of a flood event is dependent on the nature of the water body (Source) and the possible migratory routes from the water body (Pathways). The consequences of a flood event are dependent on the nature of people and assets impacted (Receptors). The Source – Pathway – Receptor linkage is illustrated in the Guidelines in the following graphic;

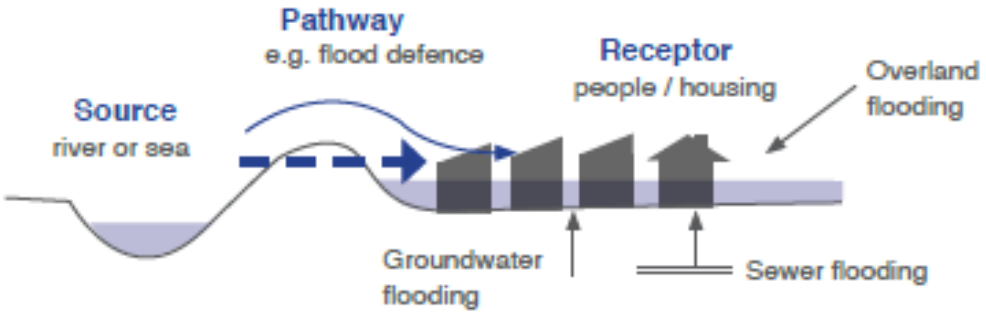


Figure 2.1 - Conceptual representation of Source - Pathway - Receptor model

The principal sources of flooding are rainfall or higher than normal sea levels. The principal pathways are rivers, drains, sewers, overland flow and river and coastal floodplains. The receptors can include people, their property, and the environment. All three elements as well as the vulnerability and exposure of receptors must be examined to determine the potential consequences.

2.2 Likelihood of Flooding

The Guidelines define the likelihood of flooding as the probability or a frequency of a flood of a given magnitude or severity occurring or being exceeded in any given year. It is generally expressed as the chance of a particular flood level being exceeded in any one year. This return period is described as the Annual Exceedance Probability (AEP). For example, a 1 in 100 or 1% flood is that which would, on average, be expected to occur once in 100 years, though it could happen at any time.

Annual Exceedance Probability is the inverse of return period as shown in **Table 2.1** below.

Table 2.1: Return period and corresponding AEP

Return Period	Annual Exceedance Probability (%)
1	100
10	10
50	2
100	1

200	0.5
1000	0.1

2.3 Flood Zones

Flood zones are geographical areas within which the likelihood of flooding is in a particular range. There are three types or levels of flood zones defined for the purposes of the Guidelines:

- **Flood Zone A** – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);

- **Flood Zone B** – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and

- **Flood Zone C** – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

It is important to note that when determining flood zones, the presence of flood protection structures should be ignored. This is because areas protected by flood defences still carry a residual risk from overtopping or breach of defences and the fact that there is no guarantee that the defences will be maintained in perpetuity.

2.4 Objectives and Principles of the Planning Guidelines

The principal actions when considering flood risk are set out in Section 3.1 of the guidelines and are summarised below:

(1) “Flood hazard and potential risk should be determined at the earliest stage of the planning process...”
(2) “Development should preferentially be located in areas with little or no flood hazard thereby avoiding or minimising the risk....”
(3) “Development should only be permitted in areas at risk of flooding when there is no alternative, reasonable sites available...”
(4) “Where development is necessary in areas at risk of flooding an appropriate land use should be selected”
(5) A precautionary approach should be applied, where necessary, to reflect uncertainties in flooding datasets and risk assessment techniques...”
(6) “Land required for current and future flood management... should be pro-actively identified...”
(7) “Flood risk to, and arising from, new development should be managed through location, layout and design incorporating Sustainable Drainage Systems (SuDS) and compensation for any loss of floodplain...”
(8) Strategic environmental assessment (SEA) of regional planning guidelines, development plans and local area plans should include flood risk as one of the key environmental criteria...”.

2.5 Staged Approach to Flood Risk Assessment

The Guidelines recommend a staged approach to flood risk assessment that covers both the likelihood of flooding and the potential consequences. The stages of appraisal and assessment are;

- **Stage 1: Flood Risk Identification** – to identify whether there may be any flooding or surface water management issues.
- **Stage 2: Initial Flood Risk Assessment** – to confirm sources of flooding that may affect an area or proposed development, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing indicative flood zone maps.
- **Stage 3: Detailed Flood Risk Assessment** – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

2.6 The Sequential Approach and Justification Test

The sequential approach has been adopted to ensure that developments are directed towards land that is at low risk of flooding, this is not always possible however, as many towns and city centers are located within flood plains.

The sequential approach is to be applied throughout the planning process is outlined in the Guidelines;

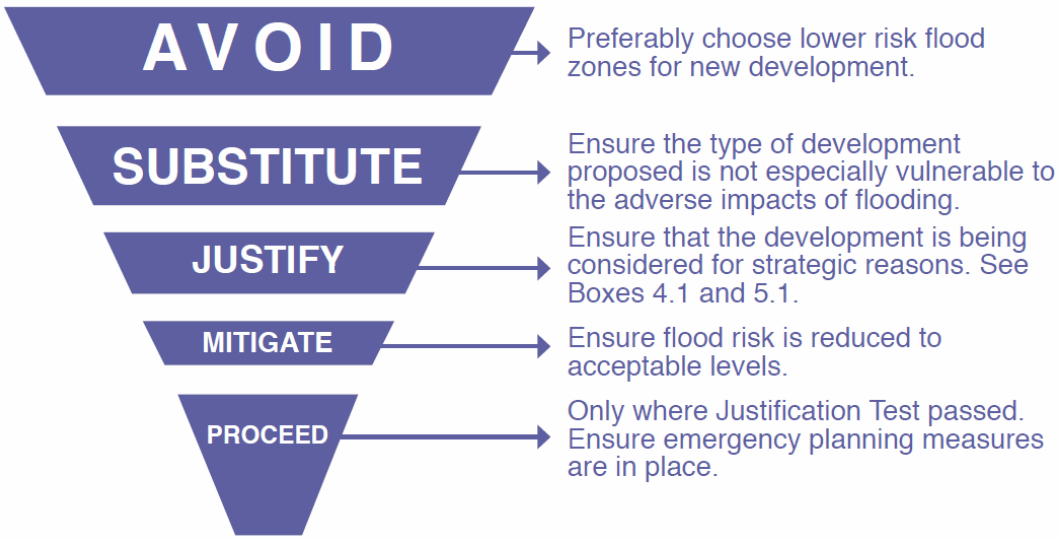


Figure 2.2 Sequential Approach (Source: The Planning System and Flood Risk Management)

The Justification Test has been designed to rigorously assess the appropriateness, or otherwise, of developments that are being considered in areas of moderate or high flood risk. The test comprises the following two processes:

(1) The first is the Plan-making Justification Test and is used at the plan preparation and adoption stage where it is intended to zone or otherwise designate land which is at moderate or high risk of flooding.

(2) The second is the Development Management Justification Test and is used at the planning application stage where it is intended to develop land at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be inappropriate for that land.

The types of development that would be required to meet the Justification Test are illustrated in the table below.

Table 2.6 Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test (Source: The Planning System and Flood Risk Management)

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

3 Flood Risk Identification

3.1 General

This Flood Risk Identification includes a review of existing information and identification of any flooding or surface water management issues in the vicinity of the proposed site that may warrant further investigation.

3.1 Data Sources

The following data sources were consulted in the preparation of this report;

Table 3.2 Information Sources Consulted

Source	Comment
OPW Preliminary Flood Risk Assessment (PFRA) mapping	Fluvial, Pluvial, Costal and Groundwater flooding examined.
OPW Floodinfo.ie online mapping	Fluvial, Pluvial, Costal and Groundwater flooding and OPW flood records examined.
EPA online mapping	Review of surface and groundwater features.
GSI Teagasc subsoils mapping	GSI Teagasc subsoils map consulted to identify alluvial deposits on site that may indicate the presence of a watercourse and floodplain.
Historical mapping	OSI Geo Hive 6'' Cassini reviewed to look for areas of historic flooding.
OPW (2018) Flood Risk Management Plan for Liffey & Dublin Bay (UOM09)	Review flood risk assessment and modelled flood levels for the Liffey & Dublin Bay.
Eastern Catchment Flood Risk Assessment and Management (CFRAM) study	Identification and review of CFRAM flood mapping and modelled flood level for the catchment.
South Dublin County Development Plan 2022-2028	Review of objectives and policies in relation to flood risk management and specific flood measure for the area.
South Dublin County Development Plan 2022-2028: Strategic Flood Risk Assessment	Review recent flood maps and strategic plan for the area.
Site Drawings	Review site levels relative to estimated flood levels.

3.2 Fluvial

The Project area is covered within the Eastern CFRAM study area. The CFRAM programme

led by the OPW, provides a detailed assessment of flooding in areas identified as AFA's during the PFRA study. Catchment wide Flood Risk Management Plans were also developed as part of the programme.

The site is located within UoM 09, which is referred to as the Liffey-Dublin Bay catchment. There are numerous watercourses which are all contained within or influence the Liffey River catchment. The approximate total length of watercourses is 265 km. The principal rivers include the Liffey, the Griffeen, the Camac, the Poddle, the Dodder and the Owendoher. Other notable streams include the Tobermaclugg, the Whitechurch, the Tallaght Stream and the Robinhood Stream. All of the watercourses lie within the Hydrometric Area (HA) 09 (Liffey- Dublin Bay). The catchments of the County are highly urbanised but there is rural land in the west and south containing agriculture, forestry, and the Dublin & Wicklow Mountains.

Road levels around the perimeter of the site range from *ca.* 63.5m OD to 64.5m OD at the development entrance on Ballymount Road Upper. The site levels reaches *ca.* 64.7m OD at the centre of the site. The lowest point of the proposed development is *ca.* 63.73m OD at the southeast corner. The proposed finished floor level (FFL) is ca. 64.0m OD.

The Camac Fluvial Flood Extents map (E09CAM_EXFCD_F1_21), dated 13 November 2017, as shown in **Appendix B** was studied. It is noted that the flood map indicated a 1 in 1000-year food level of 59.43m OD at node SO09303604 (closest node to the development). The lowest point on site at the entrance to the development is ca. 63.5m OD and ca. 4.0m OD above the closest CFRAM node (SO09303604) on the flood map, the development is not situated within any flood extents, therefore the associated flood risk is considered low and is situated within Flood Zone C. The nearest area indicated as flooding in relation to the target site is an area adjacent to Merrywell Business Park which is situated *ca.* 450m northeast of the development.

The National Indicative Fluvial Maps (NIFM) have been created to identify areas where further assessment would be required if development is being considered within or adjacent to the flood extents shown on the maps. These maps are 'predictive' flood maps showing indicative areas predicted to be inundated during a theoretical fluvial flood event with an estimated probability of occurrence, rather than information for actual floods that have occurred in the past, which is presented, where available, on the 'past' flood maps. Similar to the PFRA maps, the NIFM maps refer to flood event probabilities in terms of a percentage Annual Exceedance Probability, or 'AEP'. This represents the probability of an event of this severity occurring in any given year. They are also commonly referred to in terms of a return period (e.g. the 100-year flood), although this period is not the length of time that will elapse between two such events occurring, as, although unlikely, two very severe events may occur within a short space of time NIFM fluvial flood extents – 0.1% & 1% indicate closest lands prone to flooding are located *ca.* 760m northeast of the site.

Significant flood risk was not detected within the site boundary or near to the development.

The published CFRAM flood maps are included in **Appendix B**. A Digital Terrain Map which

includes an overview of local elevations is included in **Figure 3.2.**

Figure 3.2: Local Topography

The finished ground floor level for the development is *ca*. 64.0m OD, therefore the flood risk to the development is considered to be low.

3.3 Previous Flood Risk Assessment and Predictive Flood Maps

3.3.1 Pluvial

Pluvial flooding can occur during extreme prolonged rainfall. Pluvial flooding may occur through the below pathways during extreme rainfall.

Table 3.3.2: Pluvial Flooding S-P-R Risk Assessment

	Pathway	Receptor
1	Surcharging of the proposed internal drainage systems during heavy rainfall events leading to internal flooding	Development – Buildings

2	Surcharging from the existing surrounding drainage system leading to flooding within the subject site by surcharging surface water pipes	Development – Buildings
3	Surface water discharging from the subject site to the existing drainage network leading to downstream flooding	Development – Buildings
4	Overland flooding from surrounding areas flowing onto the subject site	Development – Buildings
5	Overland flooding from the subject site flowing onto surrounding areas	Development – Buildings

The Office of Public Works' Preliminary Flood Risk Assessment indicative pluvial maps (2012) are not considered to be reliable for assessing pluvial risk. Development drainage will however be designed to SUDs standard resulting in flood mitigation and controlled surface water discharge from the development.

Pluvial flood mapping is included in **Appendix C**.

3.3.2 Preliminary Flood Risk Assessment (PFRA)

The Preliminary Flood Risk Assessment (PFRA) involved a national screening exercise, based on available and readily derivable information, to identify areas where there may be a significant risk associated with flooding (referred to as Areas for Further Assessment, or AFA's). The area surrounding the site has been included under the PFRA as an AFA and was therefore studied under CFRAM.

3.3.3 Catchment Flood Risk Assessment and Management Study (CFRAM)

The Catchment Flood Risk Assessment and Management (CFRAM) study was commissioned in each River Basin District in order to inform on Ireland's medium to long-term strategy for the reduction and management of flood risk throughout Ireland. Data collection included historic flood event and rainfall records, high resolution floodplain surveying, and detailed channel/structure surveys of selected rivers. Hydraulic models determined flood hazard (where rivers or the sea is likely to flood in extreme events) and flood risk (the resultant impact on people, the economy, and the environment).

The Office of Public Works (OPW) are responsible for the management of the CFRAM programme and are responsible for reporting, coordination, and consultation under the Floods Directive. The CFRAM programme provides a detailed assessment of flooding in areas identified as AFA's during the PFRA study. The OPW have produced a series of maps which indicate the low, medium, and high probability flood risk for areas throughout Ireland, which were assessed as part of the CFRAM program. Catchment wide Flood Risk Management Plans were also developed as part of the programme.

The Camac CFRAM study map (No. E09CAM_EXFCD_F1_21) for the area reports that the site is within Flood Zone C, indicating that the flood risk to the development in the present day scenario is considered to be low.

Maps highlighting the site location in respect to the CFRAM maps are also included in **Appendix D.**

3.3.4 CFRAM Mid-Range Future Scenario

Two scenarios can be used with respect to future modelling and climate change for the given location:

- **Mid-Range Future Scenario (MRFS):** Likely future scenario – allowances for increased flow/sea level rise.
- **High-End Future Scenario (HEFS):** Extreme future scenario - allowances for significant increased flow/sea level rise.

The allowances, in terms of numerical values for future changes to 2100 in relevant phenomena or characteristics, which should typically be used for each of these scenarios, are set out in the **Table 3.3.5**:

Table 3.3.5: Allowances in Flood Parameters for the Mid-Range and High-End Future Scenarios

	MRFS	HEFS
Extreme Rainfall Depths	+ 20%	+ 30%
Flood Flows	+ 20%	+ 30%
Mean Sea Level Rise	+ 500 mm	+ 1000 mm
Land Movement	- 0.5 mm / year[1]	- 0.5 mm / year[1]
Urbanisation	No General Allowance – Review on Case-by Case Basis	No General Allowance – Review on Case-by Case Basis
Forestation	- 1/6 Tp[2]	- 1/3 Tp[2] + 10% SPR[3]

Note 1: Applicable to the southern part of the country only (Dublin – Galway and south of this)

Note 2: Reduction in the time to peak (Tp) to allow for potential accelerated runoff that may arise as a result of drainage of afforested land

Note 3: Add 10% to the Standard Percentage Runoff (SPR) rate: This allows for temporary increased runoff rates that may arise following felling of forestry.

In the context of this report the medium and high range future scenarios were examined. As can be seen in **Appendix E,** the site is not impacted.

3.3.5 Tidal

Tidal Flooding is caused by elevated sea levels or overtopping by wave action. The Irish Sea is approximately 9.8km east of the subject site. The Dublin Coastal Protection Project indicated that the 2002 high tide event reached 2.95m OD Malin. The subject site is, between 63.0m and 65.0m above the highest tide recorded in the Dublin Coastal area.

As can be seen in **Appendix F** the site is not affected by Coastal Flooding.

3.3.6 National Coastal Flood Mapping 2021

A review of existing indicative coastal flooding mapping from the National Coastal Flood Mapping 2021 shows that there is no potential for coastal flooding in a mid-range future or high-end future scenario. CFRAM Coastal maps also show low risk with regard to site.

As can be seen in **Appendix F** the site is not affected by Coastal Flooding.

3.3.7 GSI Groundwater Flooding

Geological Survey Ireland (GSI) have developed Groundwater Flood Maps for the Republic of Ireland, developed as part of the 2016-2019 'GWFlood' project in collaboration with Trinity College Dublin and the Institute of Technology Carlow.

Groundwater is the water that soaks into the ground from rain and can be stored beneath the ground. Groundwater floods occur when the water stored beneath the ground rises above the land surface. The Historic Groundwater Flood Map layer on the OPW map viewer shows the observed peak flood extents caused by groundwater in Ireland.

The closest groundwater flood extents are noted *ca.* 11.0km east of the proposed site. See **Appendix G.**

3.3.8 GSI Winter 2015/2016 Surface Water Flooding

The GSI developed a Winter 2015/2016 Surface Water Flooding map which attempted to measure the surface water flood extents. There are no impacted areas reported in the vicinity of the site, however an area located ca. 800m to the west is recorded.

Map highlighting the site location in respect to the Winter 2015/2016 Surface Water Flooding maps are included in **Appendix H**.

3.3.9 OPW Historic Flooding

The OPW National Flood Hazard Mapping, www.floodinfo.ie, was examined to identify any recorded flood events within the vicinity of the proposed development site. There are no records of flooding at the proposed development on the flood hazard website.

Flooding at Walkinstown Crescent, Walkinstown, Dublin 12 (Oct 2011) flood event occurred ca. 1.35 km northeast. There was no impact to the development during this flood event.

There are two recurring instances of flooding (Robinhood Stream Walkinstown, ca. 1.2 km

northeast of the site and Camac Culvert Old Naas Road, ca. 1.7 km also northeast of the site). The development is at a higher level than both areas, directing overland flows from any drainage system failure away from the development. Due to distance and topography these events are considered low risk in relation to site.

A report on Historic Flooding in proximity to the proposed site is included in **Appendix I**.

3.3.10 National Indicative Fluvial Maps (NIFM)

The National Indicative Fluvial Maps (NIFM) have been created to identify areas where further assessment would be required if development is being considered within or adjacent to the flood extents shown on the maps. These maps are 'predictive' flood maps showing indicative areas predicted to be inundated during a theoretical fluvial flood event with an estimated probability of occurrence, rather than information for actual floods that have occurred in the past, which is presented, where available, on the 'past' flood maps.

Similar to the PFRA maps, the NIFM maps refer to flood event probabilities in terms of a percentage Annual Exceedance Probability (%), or 'AEP'. This represents the probability of an event of this severity occurring in any given year. They are also commonly referred to in terms of a return period (e.g., the 100-year flood), although this period is not the length of time that will elapse between two such events occurring, as, although unlikely, two very severe events may occur within a short space of time.

NIFM fluvial flood extents mapping indicates lands with a low (0.1%) and medium (1%) probability of flooding are located *ca.* 300m north of the site.

Maps indicating the past flood events, groundwater flood events and predicted flood events as per the NIFM maps are included in **Appendix J.**

3.3.11 OPW Drainage Maps

Local authorities are charged with a responsibility to maintain Drainage Districts. The Arterial Drainage Act, 1945 contains several provisions for the management of Drainage Districts in Part III and Part VIII of the act.

Arterial Drainage Scheme (ADS) maps of the area show that the proposed site is not located within benefitting lands.

The published Arterial Drainage Scheme (ADS) and Drainage District (DD) maps has been included in **Appendix K**.

3.3.12 Historic Maps

Historical maps are consulted to indicate areas of flooding documented previously to records being kept by the current responsible authorities. The enclosed historical map has been prepared using GeoHive, web-based access to authoritative Irish spatial data from multiple providers, including Ordnance Survey Ireland (OSi). No areas of flooding were indicated on the 6" Cassini or 25" maps. Refer to **Appendix L** for Historical Mapping.

3.4 GSI Maps

GSI Teagasc subsoil map was sourced from the EPA online map viewer, it shows the subsoil characteristics of the site of interest. The proposed development site is indicated to be predominantly made ground.

Refer to **Appendix M** for GSI soils and bedrock maps.

3.5 OPW Flood Risk Management Plan - River Basin (09) Liffey and Dublin Bay

In 2018, the Office of Public Works (OPW) carried out the Flood Risk Management Plan for River Basin (09) Liffey and Dublin Bay.

The overall objective of the Plan is to manage and reduce the potential consequences of flooding, recognising other benefits and effects across a broad range of sectors including human health, the environment, cultural heritage, and economic activity, through viable flood protection schemes and other measures informed by a sound understanding of the flood risk established through the preparation of flood maps.

The main stated objectives for Flood Risk Management Plan were as follows:

- Spatial Scope: The Plan sets out viable measures, typically flood protection schemes, proposed to manage, and reduce flood risk in the communities that were identified through the PRFA as being at potentially significant flood risk. The Plan also sets out a range of non-structural policies and measures, which are in place or under development, that contribute to the reduction and management of flood risk throughout the River Basin.
- Sources of Flood Risk: The flood protection measures that are set out in the Plan address flood risk from the sources of flooding as identified in Table ES-1 of the report in one or more communities, as these sources were determined through the PFRA to be potentially significant in these communities. The range of non-structural policies and measures set out in the Plan can contribute to the reduction and management of flood risk from all sources of flood risk.
- Level of Detail: The Plan sets out the measures that have been identified as the most appropriate at this stage of assessment. The flood protection measures set out in the Plan are to an outline design and are not at this point ready for construction. Further detailed design, including a review of costs and benefits, environmental assessment, and consultation will be required for such works before implementation.

No additional measures specific to Ballymount are proposed.

3.6 Draft South Dublin County Development Plan 2022 – 2028

The purpose of the Development Plan is to set out an overall strategy for the proper planning and sustainable development for the County.

Policy IE4: Flood Risk within the County Development Plan outlines the following Objectives:

IE4 Objective 1: To require site specific flood risk assessments to be undertaken for all new

developments within the County in accordance with The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009) and the requirements of DECLG Circular P12/2014 and the EU Floods Directive.

IE4 Objective 2: To require all developments in the County to be designed and constructed in accordance with the “Precautionary Principle” detailed in the OPW Guidelines.

IE4 Objective 3: To continue to support and co-operate with the Office of Public Works in delivering the relevant Catchment-Based Flood Risk Assessment and Management Programme.

IE4 Objective 4: To support and facilitate the delivery of flood alleviation schemes in South Dublin County, including the following schemes:

- Poddle Flood Alleviation Scheme.
- Camac Flood Alleviation Scheme.
- Whitechurch Flood Alleviation Scheme.

IE4 SLO 1: To require the preparation of a site and catchment specific Flood Risk Assessment and Mitigation Strategy, prepared by a qualified person(s), to be submitted with any proposal for development on the ‘EE’ zoned lands at Moneenalion Commons Upper, Baldonnell.

3.7 South Dublin County Development Plan 2022 – 2028 SFRA

A Strategic Flood Risk Assessment (SFRA) of the County has been carried out to support the Strategic Environmental Assessment of the County Development Plan. The assessment was carried out in accordance with the requirements of the Flood Risk Management Guidelines and the EU Water Framework Directive. The SFRA Report is a separate document to be read in parallel with this Plan.

The SFRA identifies and maps flood risk in the County and has supported a sequential approach to planning, in accordance with the recommendations of the Flood Risk Management Guidelines.

3.8 Site Survey and Drawings

A topographical survey of the site was undertaken in October 2023. The site slopes gradually from southeast to northwest from approximately 64.987m OD in the southeast to 63.495m OD in the northwest. There are localised high and low points on the site.

The Camac Fluvial Flood Extents map (E09CAM_EXFCD_F1_21), dated 13 November 2017, as shown in **Appendix B** was studied. It is noted that the flood map indicated a 1 in 1000-year flood level of 59.43m OD at node SO09303604 (closest node to the development). The lowest point on site at the entrance to the development is ca. 63.5m OD and ca. 4.0m OD above the closest CFRAM node (SO09303604) on the flood map, the development is not situated within any flood extents, therefore the associated flood risk is considered low and is situated within Flood Zone C. The nearest area indicated as flooding in relation to the target site is an area adjacent to Merrywell Business Park which is situated ca. 450m northeast of the development.

Given that the proposed site will have a minimum FFL of 63.495m AOD this allows for a freeboard of *ca*. 4.06m above the most significant modelled flood event.

The site topographical survey is included in **Appendix A** of this report.

4 Proposed Design Measures

4.1 Drainage Strategy

The proposed site will be served via below ground gravity pipework which will run below the yard and below the road alongside the development. The surface water network will be fed via an ACO channel in the yard, on-road gullies, and rainwater from the building roof via guttering and downpipes.

It is proposed to collect run-off generated from impermeable areas of the site and attenuate the runoff in SuDS measures. In developing the surface water design for the site, a range of SuDS measures were reviewed. Measures which were deemed suitable in controlling the quality and quantity of water discharged from the development include:

- Rainwater harvesting;
- Collection of excess roof rainwater and run-off from impermeable surfaces and
- attenuating this run-off prior to discharge to outfall locations;
- The use of trapped gullies throughout the development;
- Permeable paving;
- Soakaways;
- Swale behind the building;
- The use of an oil interceptor.

The excess surface water runoff will be attenuated prior to discharging to the existing 300mm diameter surface water pipe located to the southwest of the site. It is proposed to provide attenuation within a 1450m3 attenuation tank in the south-eastern side of the site. This tank has been sized to store both surface water and fire water, in the event of a fire.

The rainwater from the roof of the building will be collected and will fall by gravity. On the northwestern side of the building, it will discharge into the soakaway behind the building. The soakaway will allow runoff to infiltrate into the subsoil. On the southern side of the building, the rainwater from the roof will flow by gravity through the system of 225mm to 375mm pipes at a gradient 1:150 - 1:200 on the southeast and southwest of the building, and then to the 10,000l precast concrete rainwater harvesting tank located at the entrance to the site.

The discharge from the impermeable paving will be collected via the system of ACO channels in the yard area and gullies on the road.

Prior to the surface water discharging into the existing public drainage system, it will be flow controlled to greenfield runoff rates and will pass through a full retention oil interceptor.

The following design criteria has been incorporated into the design:

- Pipes are designed for small catchment areas as defined in GDSDS, based on the
- Modified Rational Method and a rainfall intensity of 50mm/hour onto impermeable
- surfaces.
- All surface water pipes have been designed to achieve a minimum self-cleansing
- velocity of 0.75m/s.
- Surface water pipework will be laid to a gradient no flatter than 1:500.

- The GDSDS requirements with respect to interception volume, long-term storage volume and treatment volume have been considered.
- Minimum surface water pipe size of 225mm
- Minimum depth of cover to pipework of 1.2m below roads without appropriate protection
- Maximum depth of pipework 5m
- Roughness value for surface water pipework, ks 0.6mm

4.2 Catchment and SuDS Systems

The proposed site layout has been designed to have its own storage via permeable paving, attenuation and rainwater harvesting tanks and soakaway. Each catchment will have a gravity surface water drainage network which will outfall into a dedicated SuDS area. The permeable paving, tanks and soakaway will be sized to store the runoff from a 1:100-year storm of critical duration plus a 20% climate change allowance. From the modelling carried out of the stormwater network, a minimum storage of 410m3 is required in the offline attenuation tank. A tank of size 1450m3 has been provided; this tank has been sized to store surface water and also fire water in the event of a fire. In addition to this, storage is provided in the permeable paving, soakaway, rainwater harvesting tank and swale. The attenuation storage provided is greater than the attenuation required and is therefore determined to be sufficient.

4.3 Flow Controls

The surface water collected within the site will flow into the SuDs measures and where possible will infiltrate into the subsoil or discharge to the proposed 225mm surface water network. The final manhole before the discharge shall include a flow control device to limit flows to greenfield run-off rates.

4.4 Oil Interceptors

A full retention oil Interceptor will be installed prior to discharge into the existing surface water system on Ballymount Road Upper. All surface water shall be drained from impermeable areas through precast lockable gully traps.

Please refer to ORS drawing nos. **221244-ORS-ZZ-00-DR-CE-400, 221244-ORS-ZZ-00- DR-CE-401, 221244-ORS-ZZ-00-DR-CE-420** and **221244-ORS-ZZ-00-DR-CE-421** for details of the proposed surface water drainage for the development.

5 Justification Test

5.1 Background

The Justification Test has been designed to rigorously assess the appropriateness, or otherwise, of developments that are being considered in areas of moderate or high flood risk. The Strategic Flood Risk Assessment (SFRA) which was carried out as part of the preparation of the County Development Plan has highlighted the comparison of flood zones with existing or proposed zoning may reveal conflicts between flood risk areas and areas zoned for development. In such cases, the Planning Authority must subject each site to the Justification Test.

The Strategic Flood Risk Assessment (SFRA) also recommends that a Justification Test is carried out for any development proposed for lands in Flood Risk Zone A or B. The proposed development works are scheduled within a Flood Zone C as reported in the CFRAM Study, therefore the Justification test is not applied to the proposed development.

6 Conclusions

In reviewing existing information in relation to the flood risk posed to the proposed development site the following sources were consulted:

- OPW Preliminary Flood Risk Assessment (PFRA) mapping
- OPW Floodinfo.ie online mapping
- EPA online mapping
- GSI Teagasc subsoils mapping
- Historical mapping
- OPW (2018) Flood Risk Management Plan for Liffey & Dublin Bay (UOM09)
- Eastern Catchment Flood Risk Assessment and Management (CFRAM) study
- South Dublin County Development Plan 2022-2028
- South Dublin County Development Plan 2022-2028: Strategic Flood Risk Assessment
- Site Drawings

There have been no recorded historic flooding incidents within the development boundaries.

The extent of the Area of Further Assessment (AFA) covers the site location hence projected flood levels were modelled for this development location under the CFRAM program indicating that the development is positioned in Flood Zone C, therefore the flood risk associated with this development is low.

The subject site has been analysed for risks from tidal flooding from the Irish Sea, fluvial flooding, pluvial flooding, groundwater, reservoir flooding and drainage system failures due to human error or mechanical system failure. Table 5 below presents the various residual flood risks involved. As the flood risk from all sources can be mitigated, reducing the flood risk to low or very low, the proposed development is considered acceptable in terms of flood risk.

Due to all the considerations above the risk of an increased flood risk elsewhere of the development is considered to be low, as summarised in **Table 7.1**.

Table 7.1: Flood Risk Assessment Summary

Source	Pathway	Receptor	Likelihood	Consequence	Risk	Mitigation Measure	Residual Risk
Tidal	Irish Sea Coastal zone	Development	Low	High. Flooding of building and the basements	Low	None required	**Low**
Fluvial	Camac	Development	Low	Moderate. Water ingress into the building and basements	Low	None required	**Low**
Pluvial	Private and Public Drainage Network	Development	Low	High. Flooding of the building and basements	High risk of damage to the building and basement	Appropriate drainage design, over land flood routing and setting of appropriate floor levels	**Low**
Ground Water	Groundwater present in the ground seeping through basement walls and floor	Development	Low	Moderate. Ground water ingress into basement	Low	Adequately waterproofing of basement structure	**Low**
Human / Mechanical Error	Drainage network	Development	Low	Moderate. Water ingress into the building and basements	Moderate risk of damage to the building	Maintenance strategy	**Low**
Reservoir	Private and Public Drainage Network	Development	Low	Moderate. Water ingress into the building and basements	Very Low	None required	**Low**

Appendix A: Existing Topography

Site Outline Panda

OPW_3122

OPW_3122_DTM.tif

Band 1 (Gray)

84.134041

42.410732

0 100 200 m

Appendix B: CFRAM Fluvial Map

Site Outline Panda

River - High Probability

River - Medium Probability

River - Low Probability

0.1% AEP CFRAM Extent

1% AEP CFRAM Extent

10% AEP CFRAM Extent

0 250 500 m

Appendix C: Pluvial Flooding Map

Site Outline Panda

Low Probability Pluvial Extent

Medium Probability Pluvial Extent

High Probability Pluvial Extent

Google Earth Base Map

0 200 400 m

Appendix D: CFRAM Maps

Node Label	Water Level (OD) 10% AEP	Flow (m^3/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m^3/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m^3/s) 0.1% AEP
09WALK00068	46.4	0.03	46.77	0.06	46.96	0.11
09KING00063	44.52	N/A	44.97	N/A	45.15	N/A
09WALK00038	46.34	2.10	46.73	4.02	46.91	6.70
09KILN00051J	51.2	N/A	51.48	N/A	51.74	N/A
09KING00092	47.17	N/A	47.31	N/A	47.52	N/A
SO09303604	59.11	N/A	59.2	N/A	59.43	N/A
SO10302403	55.47	N/A	55.63	N/A	55.9	N/A

309200 309400 309600 309800 310000 310200 310400 310600

231400 231200 231000 230800 230600 230400

09KING00063

<10% AEP

09WALK00038

09WALK00068

09KING00092

09KILN00051J

SO09303604

SO10302403

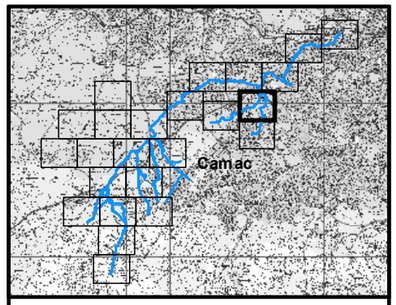
ROBINHOOD
Robinhood

FOX-and-GEESE
An Sionnach agus na Geanna

BALLYI
Baile ar

KINS
(Part of)
Baile Bh

0 50 100 200 300 400 500 Metres



IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Embankment
- Wall
- Defended Area
- 1% AEP — Standard of Protection of Flood Defence (Walls / Embankments)
- 1% AEP
- Node Point
- Node ID — Node Label

FINAL

REV:	NOTE:	DATE:
01	SOP label updated (Pg 21) Removal of Def. Area (Pg 21)	13/11/2017

EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

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The Office of Public Works
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Co Meath

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74 Boucher Road
Belfast
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T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com

Map: Camac Fluvial Flood Extents

Map Type:	EXTENT
Source:	FLUVIAL
Map Area:	HPW
Scenario:	CURRENT
Drawn By :	C.McG. Date : 13 November 2017
Checked By :	A.S. Date : 13 November 2017
Approved By :	S.P. Date : 13 November 2017
Drawing No. :	E09CAM_EXFCD_F1_21
Map Series :	Page 21 of 24
Drawing Scale :	1:5,000 @A3

Appendix E: Mid-Range Future Scenario and High End Future Scenario Map

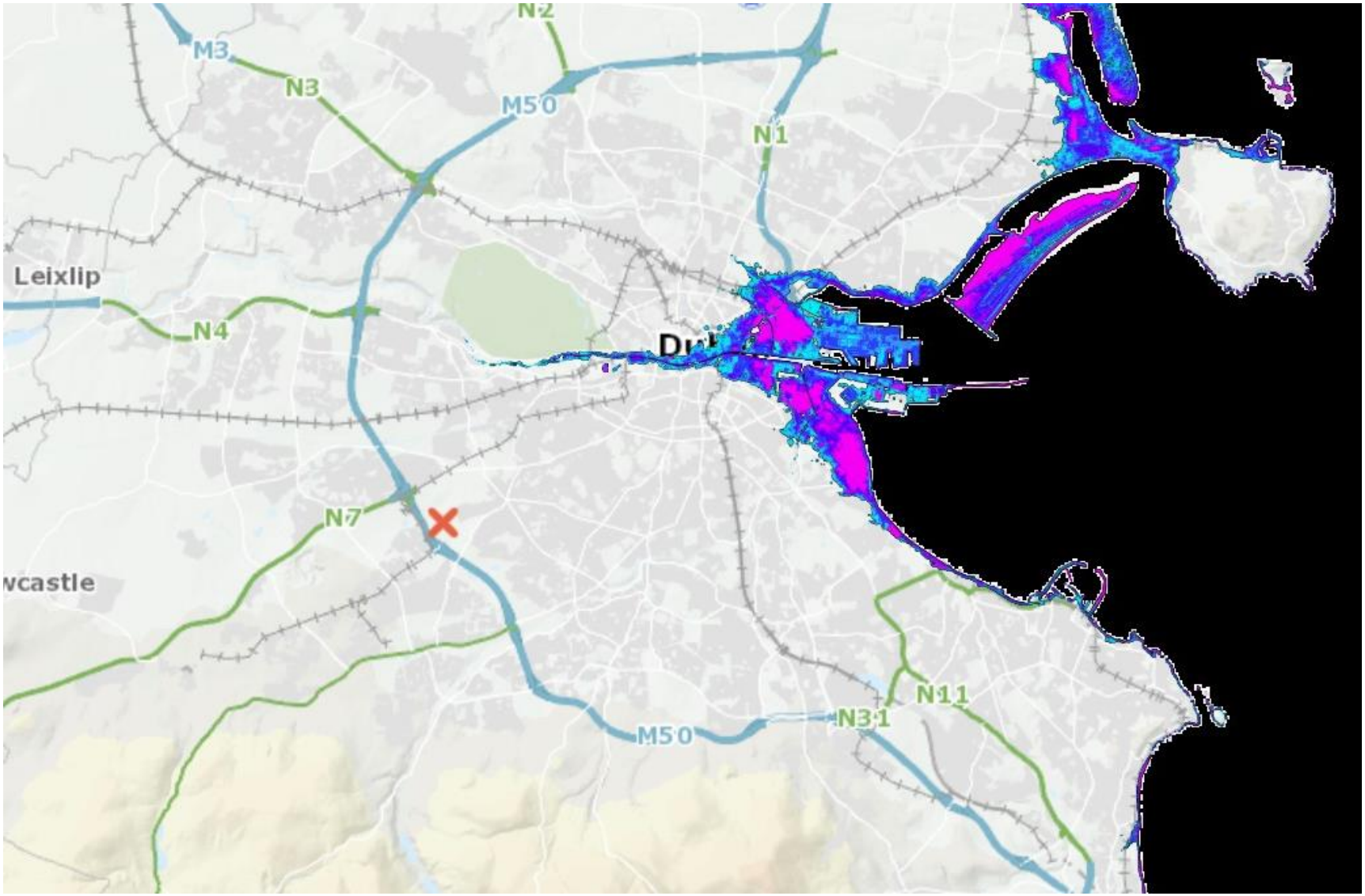
Site Outline Panda
0.1% AEP Fluvial
1% AEP Fluvial
10% AEP Fluvial
Google Earth Base Map

0 200 400 m

Site Outline Panda
0.1% AEP Fluvial
1% AEP Fluvial
10% AEP Fluvial
Google Earth Base Map

0 200 400 m

Appendix F: Coastal Flooding Map


N2
M3
N3
M50
N1
Leixlip
N4
N7
wcastle
N11
N31
M50

Appendix G: Groundwater Flooding Map

Appendix H: GSI Winter Surface Water Flooding Map

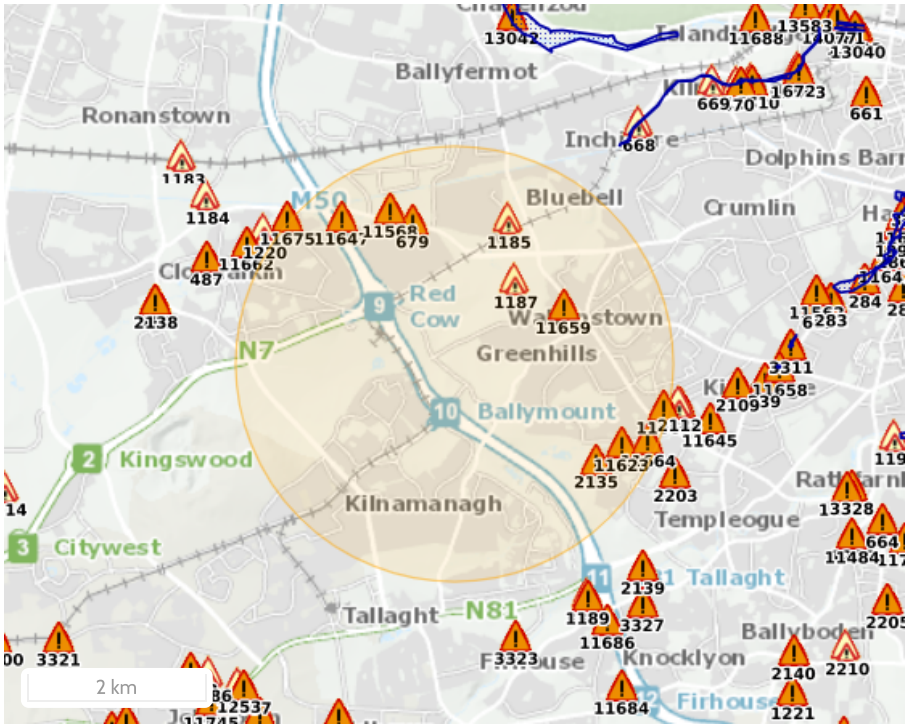
Appendix I: OPW Historic Flooding Map

Past Flood Event Local Area Summary Report

Report Produced: **26/10/2023 14:35**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

11 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Osprey Estate Nov 1982 (ID-2135)	05/11/1982	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
2.	Camac November 2000 (ID-679)	05/11/2000	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
3.	Camac Culvert Old Naas Road recurring (ID-1185)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
4.	Robinhood Stream Walkinstown Recurring (ID-1187)	n/a	Approximate Point
	Additional Information: Reports (3) Press Archive (0)		
5.	Flooding at Diageo, Nangor Road, Dublin 12 on 24th Oct 2011 (ID-11568)	23/10/2011	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
6.	Flooding at Riverview Business Centre, New Nangor Road, Dublin 12 on 24th Oct 2011 (ID-11647)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		

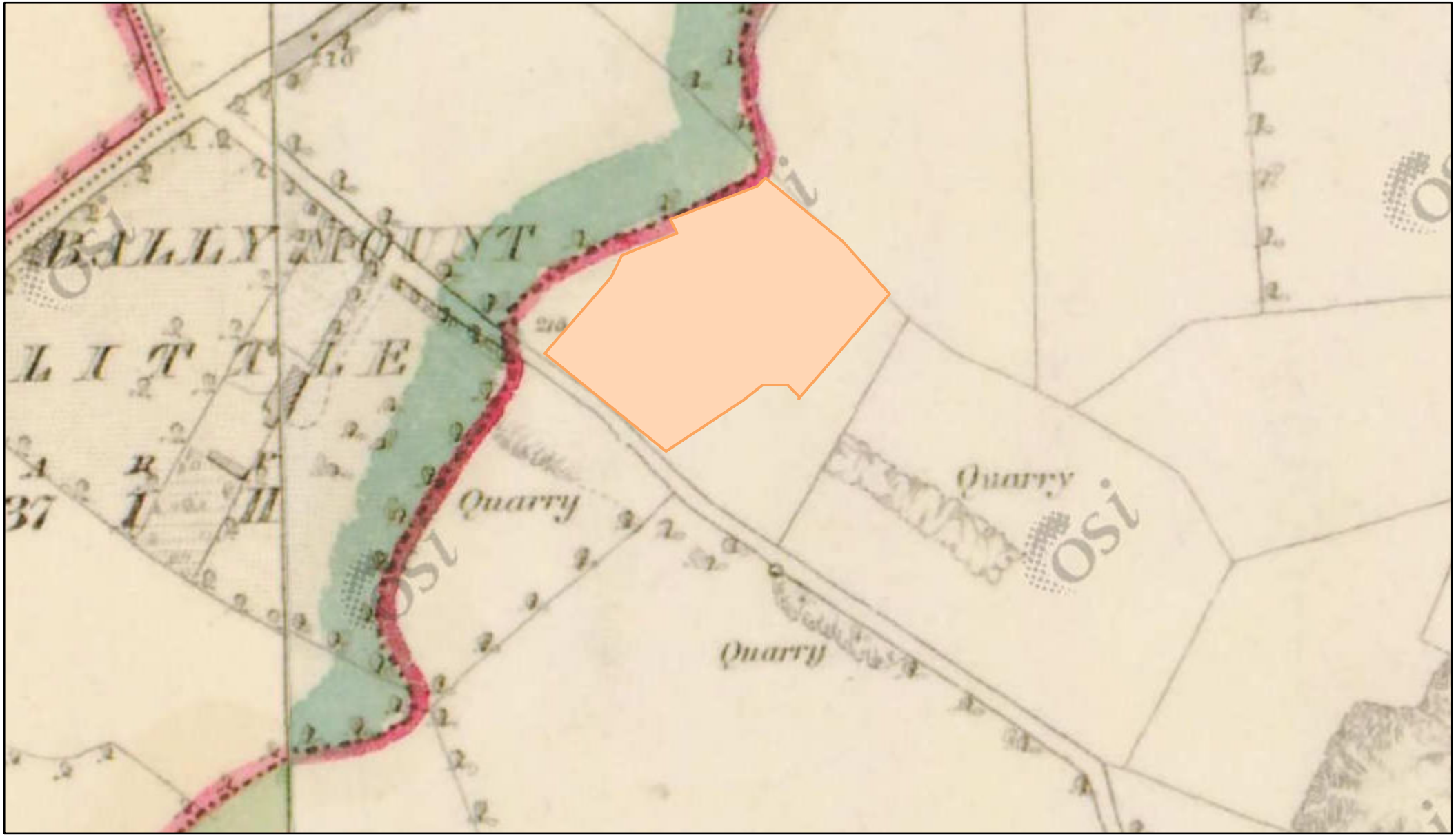
	Name (Flood_ID)	Start Date	Event Location
7.	Flooding at Limekiln Road, Ballyboden Rd, Co. Dublin on 24th Oct 2011 (ID-11623) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Approximate Point
8.	Flooding at Robinhood Industrial Estate, Clondalkin, Dublin 12 on 24th Oct 2011 (ID-11654) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
9.	Flooding at Walkinstown Crescent, Walkinstown, Dublin 12 on 24th Oct 2011 (ID-11659) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
10.	Flooding at Wellington Lane, Dublin 24 on 24th Oct 2011 (ID-11664) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
11.	Flooding at Whitehall Road, Templeogue, Dublin 6W on 24th Oct 2011 (ID-11666) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point

Appendix J: NIFM Fluvial Flood Mapping

Appendix K: OPW Drainage Maps

Appendix L: Historic Development Maps

6" Historic Map



April 19, 2023

1:2,500

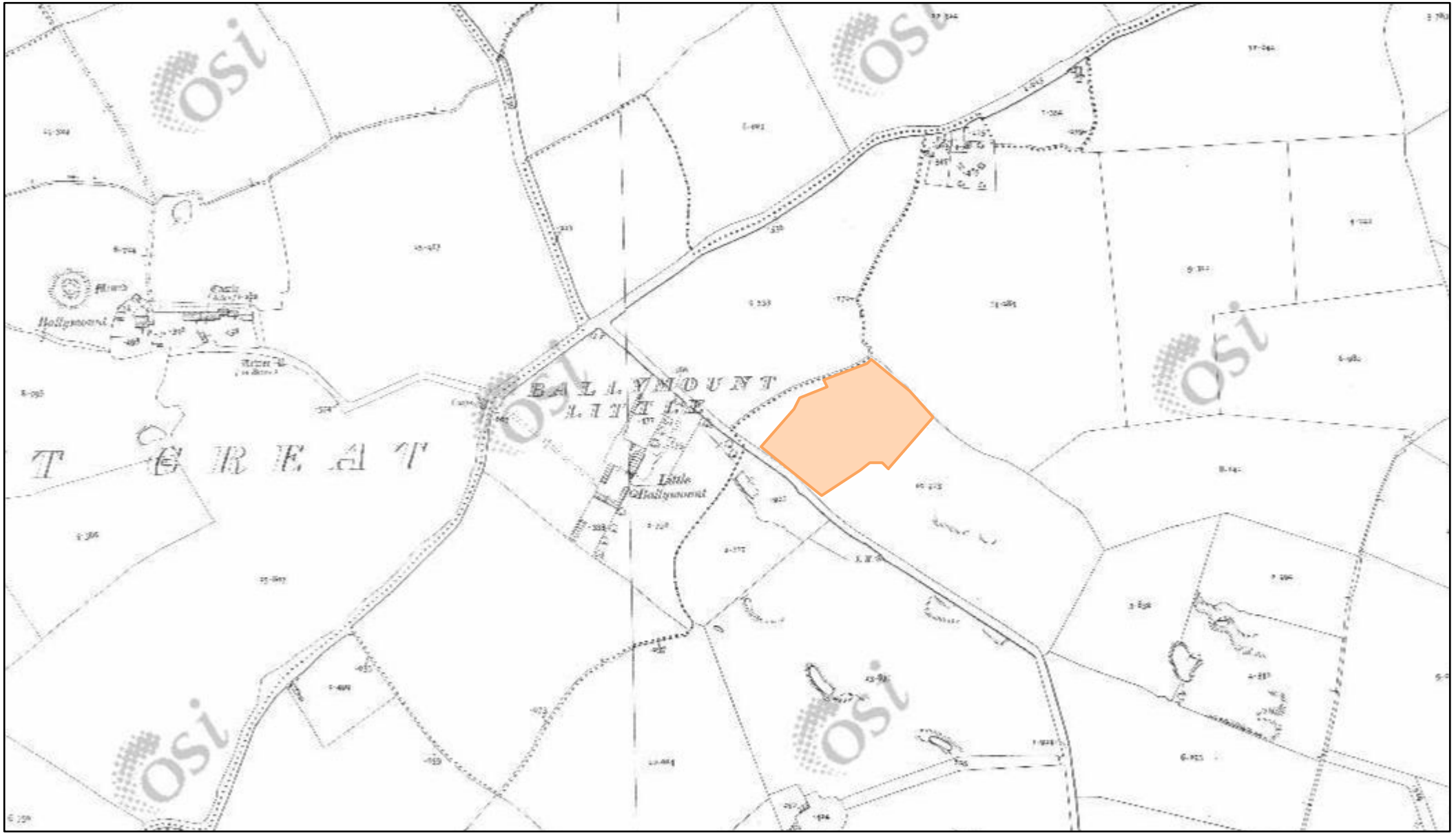
0 0.02 0.04 0.08 mi

0 0.03 0.07 0.13 km

Myplan

DHLGH

25 Inch Map



April 19, 2023

1:5,000

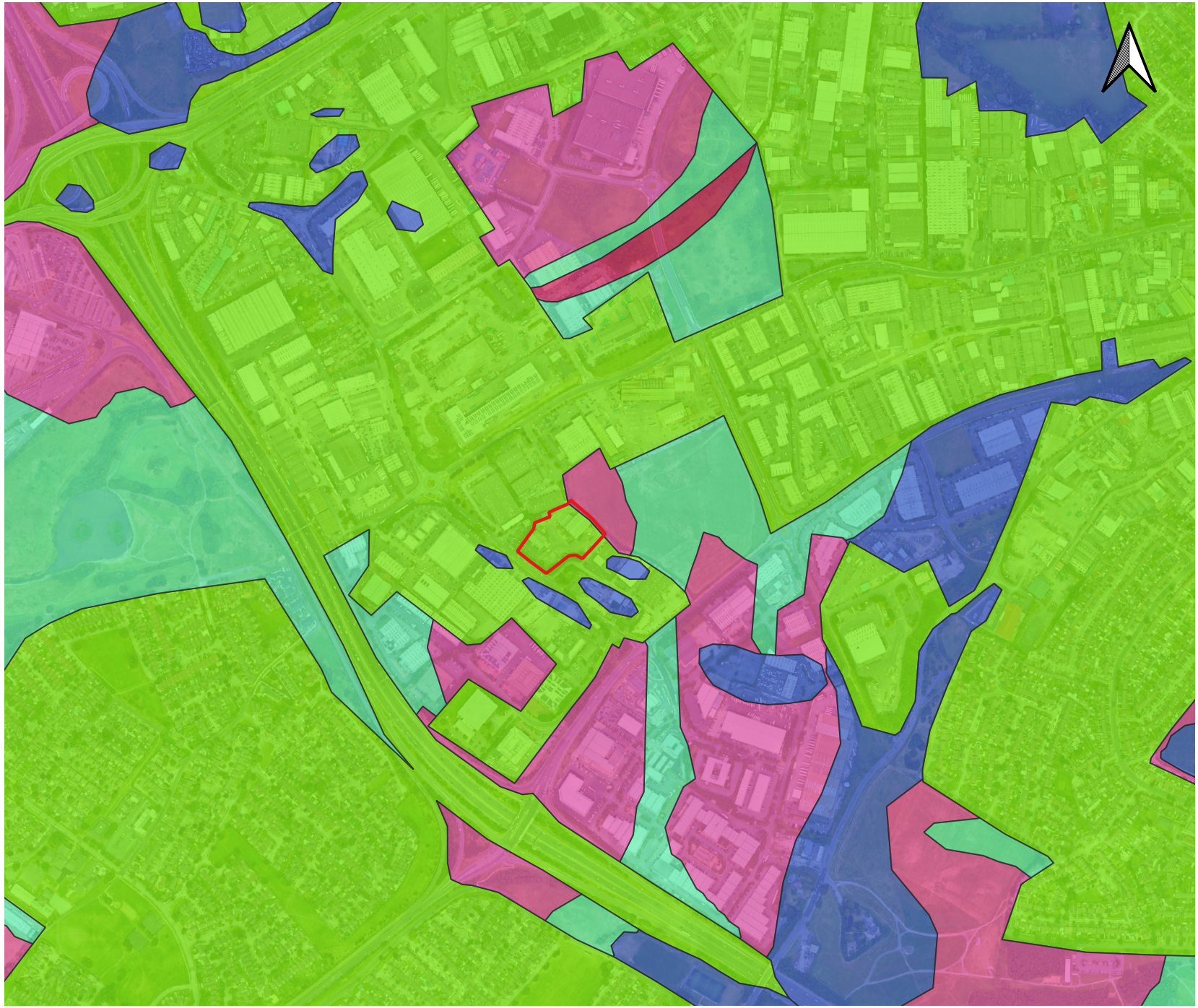
0 0.04 0.09 0.17 mi

0 0.05 0.1 0.2 km

Myplan

DHLGH

Appendix M: GSI Soils and Bedrock Maps



Site Outline Panda

Soils — Soils/Data/soils_ie_f1.shp

- AlluvMIN
- BminDW
- BminPD
- BminSW
- Made

Google Satellite

0 200 400 m

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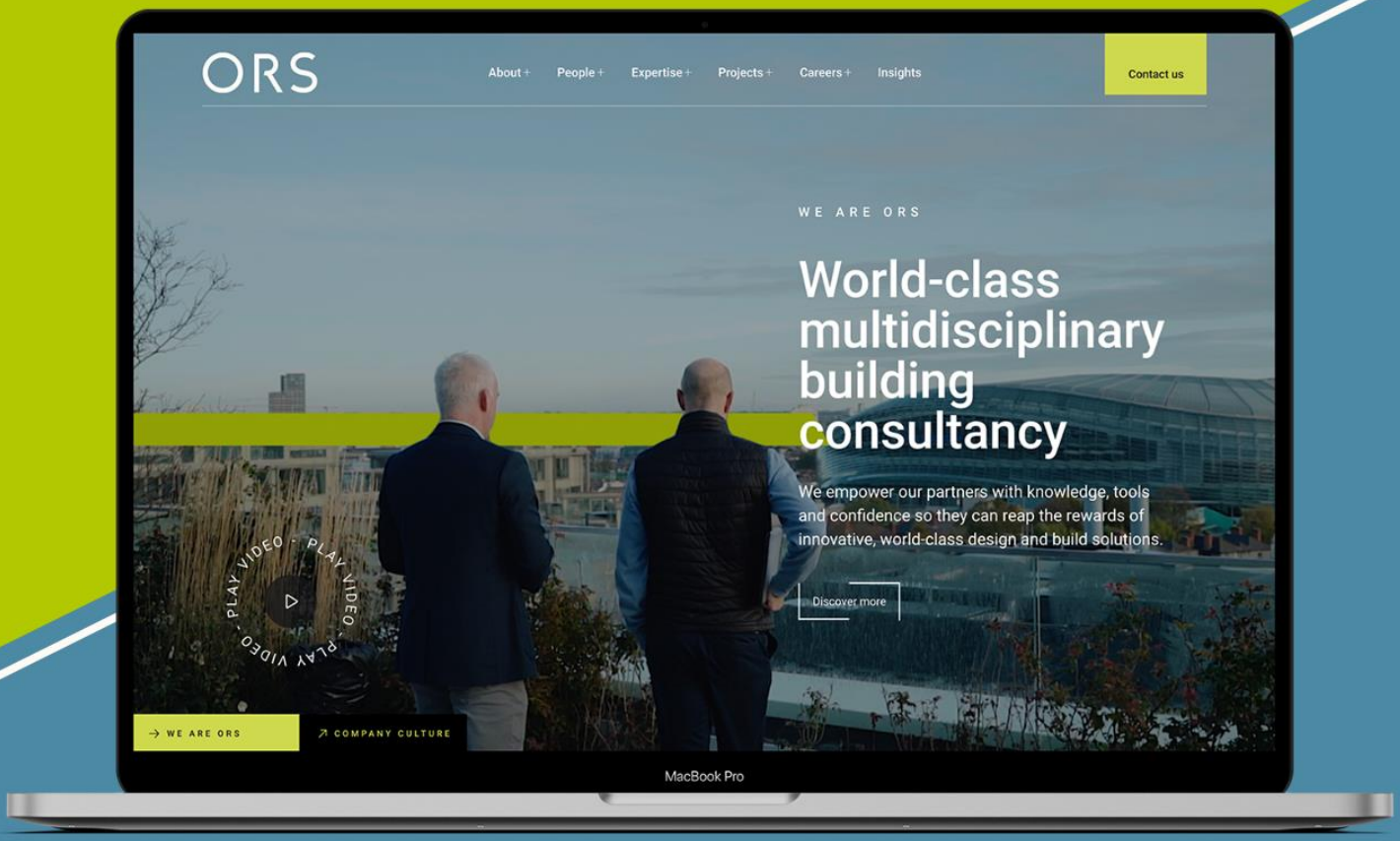

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Enterprise Centre, Lurganboy,
Donegal Town, Co. Donegal,
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NSQ2,
Navigation Square,
Albert Quay, Cork
Ireland, T12 W351

APPENDIX 8.1

NRA Guidelines

Appendix 8.2. NRA 2009 Guidelines

Examples of valuation at different geographical scales

Ecological valuation: Examples

International Importance:
 	
• **'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation and Proposed Special Protection Area (pSPA).**
 	
• **Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).**
• **Features essential to maintaining the coherence of the Natura 2000 Network.[1]**
• **Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.**
• **Resident or regularly occurring populations (assessed to be important at the national level) [2] of the following:**
  ○ **Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or**
  ○ **Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.**
• **Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).**
• **World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).**
• **Biosphere Reserve (UNESCO Man & The Biosphere Programme).**
• **Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).**
• **Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).**
• **Biogenetic Reserve under the Council of Europe.**
• **European Diploma Site under the Council of Europe.**
• **Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).[3]**

National Importance:
 	
• **Site designated or proposed as a Natural Heritage Area (NHA).**
• **Statutory Nature Reserve.**
• **Refuge for Fauna and Flora protected under the Wildlife Acts.**
• **National Park.**
• **Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.**
• **Resident or regularly occurring populations (assessed to be important at the national level)[4] of the following:**
  ○ **Species protected under the Wildlife Acts; and/or**
  ○ **Species listed on the relevant Red Data list.**
• **Site containing 'viable areas'[5] of the habitat types listed in Annex I of the Habitats Directive.**

County Importance:
 	
• **Area of Special Amenity.[6]**
• **Area subject to a Tree Preservation Order.**
• **Area of High Amenity, or equivalent, designated under the County Development Plan.**
• **Resident or regularly occurring populations (assessed to be important at the County level)[7] of the following:**
  ○ **Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;**
  ○ **Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;**

- **Species protected under the Wildlife Acts; and/or**
- **Species listed on the relevant Red Data list.**

- **Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.**
- **County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, [8] if this has been prepared.**
- **Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.**
- **Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.**

Local Importance (higher value):

- **Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;**
- **Resident or regularly occurring populations (assessed to be important at the Local level)[9]of the following:**
  - **Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;**
  - **Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;**
  - **Species protected under the Wildlife Acts; and/or**
  - **Species listed on the relevant Red Data list.**
- **Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;**
- **Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.**

Local Importance (lower value):

- **Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;**
- **Sites or features containing non-native species that are of some importance in maintaining habitat links.**

1 See Articles 3 and 10 of the Habitats Directive.

2 It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

3 Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

4It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

5 A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

6 It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

7 It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

8 BAP: Biodiversity Action Plan

9 It is suggested that, in general, 1%of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle

APPENDIX 9.1

Air Quality

Ballymount Material Recovery Facility - EIAR Air Quality Chapter - Appendix

Prepared for:

Starrus Eco Holdings Ltd

December 2023

Final

Prepared by:

Katestone Environmental Pty Ltd
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Prepared by:	Micheal Fogarty and Frank Quintarelli
Reviewed by:	Simon Welchman
Approved by:	
	Simon Welchman
	04/12/2023

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Contents

APPENDIX METEOROLOGICAL MODELLING METHODOLOGY

A1 CALCULATION OF Z_0 AND THE ALBEDO AND BOWEN RATIO

A1.1 Calculation of Z_0

The AERMOD and AERMET manuals specify that Z_0 should be determined based on land cover within a 1.0 km radius from the meteorological site located at Casement Aerodrome, Co Dublin (Lat, Lon = 53.3031, -6.4509, elevation = 91m). If the value of Z_0 varies significantly by direction, sector dependency should be used, with sector width >= 30 degrees.

From the aerial view images, the land use within a 1 km radius is mainly airport with small areas of airport infrastructure which were assigned as industrial/commercial land use and is sector dependent. The land use sectors in the vicinity of the meteorological monitoring site at Casement Aerodrome are presented in Figure A1.

Figure A1 **Land use in the vicinity of the meteorological monitoring site at Casement Aerodrome**

The sector boundaries, land use, seasonal Zo values for each sector and individual sector weights are presented in Table A.1 and Table A.2.

Table A.1 **Sector boundaries and seasonal Zo values**

Sector	WDir-1	WDir-2	Summer	Autumn	Winter	Spring
A	255	26	0.0700	0.0700	0.0700	0.0700
B	26	65	0.1980	0.1980	0.1980	0.1980
C	65	130	0.0700	0.0700	0.0700	0.0700
D	130	170	0.1201	0.1201	0.1201	0.1201
E	170	225	0.0700	0.0700	0.0700	0.0700
F	225	255	0.0954	0.0954	0.0954	0.0954

Table A.2 Land use and weightings for each sector

Sector	Land Use	Land Use Weight (%)	Distance Weight (%)	Final Zo Weighting (%, normalised)
A	Sites at airports	100	53	188
B	Sites at airports	38	41	93
	Industrial/Commercial	62	81	76
C	Sites at airports	100	63	159
D	Sites at airports	66	53	124
	Industrial/Commercial	34	89	38
E	Sites at airports	100	64	156
F	Sites at airports	81	60	136
	Industrial/Commercial	19	92	21

A1.2 Calculation of Albedo and Bowen Ratio

The Albedo and Bowen ratio should be determined based on land cover within a 10km x 10km domain. A simple unweighted mean should be used for the Albedo and a weighted geometric mean for the Bowen ratio, without the need for sector dependency. The 10 km aerial view image is shown in Figure A2, and the results for the Albedo and ("average", i.e. - not "wet", not "dry") Bowen ratios are presented in Table A3 and Table A4, respectively.

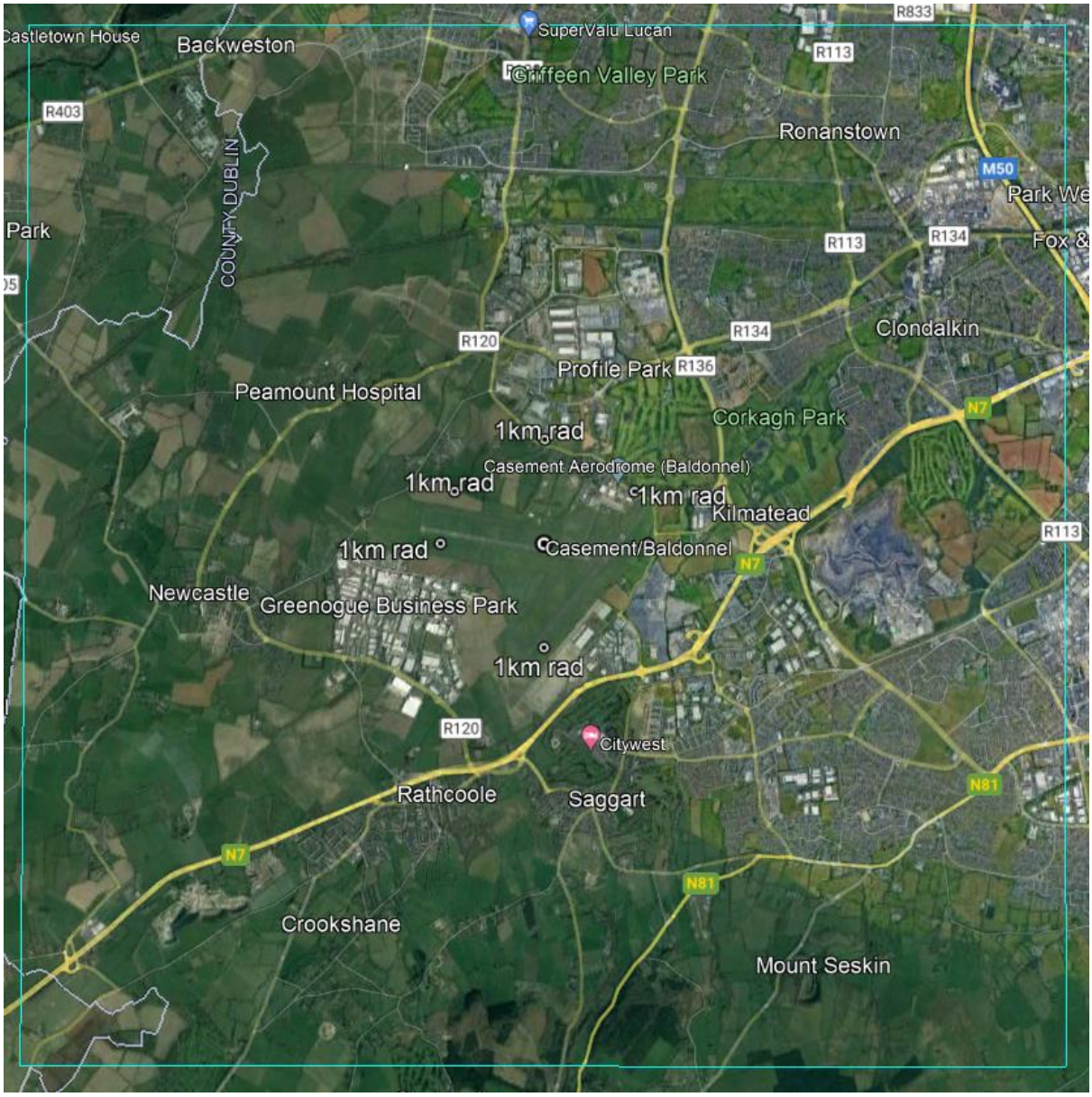


Figure A2 **Land cover within a 10km x 10km domain of Casement Aerodrome monitoring location**

Table A.3 Seasonal Albedo values

Land use	Land Fraction (%)	Summer	Autumn	Winter	Spring
Low intensity Residential	21	0.033	0.033	0.037	0.033
Industrial/Commercial	12	0.022	0.022	0.022	0.022
Quarries/Strip Mines/Gravel	2	0.004	0.004	0.004	0.004
Sites at Airports	4	0.007	0.007	0.007	0.007
Grassland	62	0.111	0.111	0.124	0.111
Weighted Average		**0.176**	**0.176**	**0.193**	**0.176**

Table A.4 Seasonal Bowen Ratio weighted values

Land use	Land Fraction (%)	Summer	Autumn	Winter	Spring
Low intensity Residential	21	0.955	1.000	1.000	0.955
Industrial/Commercial	12	1.050	1.050	1.050	1.050
Quarries/Strip Mines/Gravel	2	1.008	1.008	1.008	1.008
Sites at Airports	4	1.015	1.015	1.015	1.015
Grassland	62	0.871	1.000	1.000	0.568
Geometric weighted mean		**0.893**	**1.074**	**1.074**	**0.582**

APPENDIX 10.1

Noise Assessment

Noise impact assessment: Proposed changes to Panda waste management facility at Ballymount, Dublin

Report prepared by Damian Brosnan, MKO
Report issued 05.12.23

Summary

Despite the site's location in an industrial area, there are six dwellings locally, all situated along Ballymount Road Upper to the southeast of the site entrance. Several of these are connected with immediately adjacent commercial activities. The local soundscape is entirely dominated by road traffic.

It is proposed to demolish both buildings onsite, and to replace them with a single waste management building. In the building, wastes imported by HGV will be sorted using a combination of mechanical and automated processes. The separated waste streams will be bulked and exported offsite, again by HGV, for further downstream recycling. Wastes will be imported by skip HGVs, refuse collection HGVs, and other HGVs.

Once commissioned, noise impacts at surrounding receptors will be imperceptible. A BS 4142:2014 assessment indicates that no adverse impacts will arise. Noise levels will meet WHO criteria. No indirect impacts or interactive effects have been identified. There will be no adverse noise impacts on the local population or on human health. No cumulative impacts will arise

Contents

1 Introduction

1.1 Overview

MKO was instructed by O'Callaghan Moran & Associates, on behalf of Panda, to undertake an assessment of potential noise and vibration impacts associated with the proposed development. Potential impacts may be divided into the following categories:

- Construction phase noise impacts on surrounding receptors.
- Construction phase vibration impacts on surrounding receptors.
- Operational noise impacts on surrounding receptors.
- Operational vibration impacts on surrounding receptors.

Following a preliminary scoping exercise, it was concluded that the proposed development will not give rise to any vibration impacts following commissioning, and this category has therefore been scoped out. The remaining three categories are assessed in this report.

1.2 Development summary

The applicant currently operates a waste management facility at the proposed development site. The facility consists of two buildings: an administration building near the site entrance, and a larger building at the rear of the site wherein all waste management operations are undertaken. External yards are used for HGV parking. The facility is regulated by the EPA through waste licence W0039-02 issued 04.09.00.

It is proposed to demolish both buildings, and to replace them with a single waste management building. In the building, wastes imported by HGV will be sorted using a combination of mechanical and automated processes. The separated waste streams will be bulked and exported offsite, again by HGV, for further downstream recycling. Waste streams processed onsite will consist of skip waste and municipal solid waste (MSW). Wastes will be imported by skip HGVs, refuse collection HGVs, and other HGVs.

Proposed waste management operations will be similar to those currently undertaken. The chief changes will consist of an increase in waste throughput from 150,000 t to 350,000 t per annum, and the enhancement of the MSW processing capacity through the introduction of automated processing plant such as trommels, wind sifters and magnetic separators. All operations will be confined to the proposed building with several roller shutter doors. The doors will be closed during operations to maintain negative air pressure, and will open only to allow HGV access and egress.

1.3 Methodology

Typical ambient noise levels across the local area were measured, and these used to identify appropriate construction phase noise criteria. Likely construction plant were identified, and their noise emissions data used to predict noise levels at surrounding receptors. Predicted levels were assessed in the context of identified criteria, and mitigation measures identified where required. Potential sources of vibration during the construction phase were also identified, and impacts assessed by reference to commonly applied criteria.
Noise sources associated with the commissioned development were reviewed, and potential impacts assessed in the context of relevant criteria. Such impacts relate to operational noise emissions arising onsite, and road traffic. Mitigation measures were identified.

1.4 Documents consulted

The assessment was undertaken having regard to guidance set out in *Guidelines on the information to be contained in environmental impact assessment reports* (Environmental Protection Agency, 2022). The following documents were also consulted during the preparation of this chapter:

- *Report RI 8507: Structural response and damage produced by ground vibration from surface mines blasting* (US Bureau Of Mines, 1980).
- *British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration* (1993).
- *Guidelines on community noise* (World Health Organisation, 1999).
- *Directive 2002/49/EC of the European Parliament and of the Council relating to the assessment and management of environmental noise* (2002), transposed into Irish law by the *European Communities (Environmental Noise) Regulations 2018* (SI No. 549/2018).
- *Night noise guidelines for Europe* (World Health Organisation, 2009).
- *Design manual for roads and bridges* (UK Highways Agency, 2011).
- *British Standard BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound* (2019).
- *British Standard BS 5228-1:2009+A1:2014 code of practice for noise and vibration control on construction and open sites – Part 1: Noise* (2014).
- *British Standard BS 5228-2:2009+A1:2014 code of practice for noise and vibration control on construction and open sites – Part 2: Vibration* (2014).
- *Good practice guidance for the treatment of noise during the planning of national road schemes* (National Roads Authority (now Transport Infrastructure Ireland), 2014).
- *Guidelines for environmental noise impact assessment* (Institute of Environmental Management and Assessment, 2014).
- *NG4 Guidance note for noise: Licence applications, surveys and assessments in relation to scheduled activities* (Environmental Protection Agency, 2016).
- *Dublin agglomeration action plan relating to the assessment and management of environmental noise December 2018 – November 2023 (noise action plan) – Volume 4: South Dublin County Council* (South Dublin County Council, 2018).

A baseline noise survey was undertaken in accordance with *International Standard ISO 1996-2:2017 Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels* (2017). Predictive modelling was carried out using *International Standard ISO 9613-2:1996 Acoustics: Attenuation of sound during propagation outdoors – Part 2: General method of calculation* (1996).

1.5 Qualifications

The noise and vibration assessment was undertaken by Damian Brosnan of MKO who has over 20 years' experience in scoping and carrying out such impact assessments. His qualifications are as follows:

- BSc (Honours) 1993 (University College Cork).
- Diploma in Acoustics & Noise Control 2009 (Institute of Acoustics).
- MSc (Distinction) in Applied Acoustics 2015 (University of Derby).
- Member of Institute of Acoustics (MIOA).
- Member of Association of Acoustic Consultants of Ireland (AACI).
- Member of Engineers Ireland (MIEI).
- Lead author of *Environmental noise guidance for local authority planning & enforcement departments* (AACI, 2019).
- 1996-2001: Noise Officer with Cork County Council.

- 2001-2014: Partner with DixonBrosnan Environmental Consultants, specialising in EIA.
- 2015-2023: Principal at Damian Brosnan Acoustics.
- 2023--: Project Director Acoustics at MKO.

1.6 Difficulties

No difficulties were encountered in preparing this chapter.

2 Guidance

2.1 Construction phase noise

There are no national mandatory noise limits relating to temporary construction works. In granting planning permission, a local authority may stipulate construction phase noise limits applicable to daytime, evening, night-time and weekend hours as appropriate. There are no national guidelines available regarding the selection of such limits. Many local authorities chose to apply a 65 dB $L_{Aeq\ T}$ limit.

The chief noise guidance document applied in Ireland and the UK in construction phase noise assessments is *British Standard BS 5228-1:2009+A1:2014 code of practice for noise and vibration control on construction and open sites – Part 1: Noise* (2014). Annex E of the document sets out several methods to draw up suitable noise criteria applicable to the construction phase of a project. The most appropriate method here is the 'ABC method', which provides for the selection of criteria based on existing ambient noise data. On the basis of noise data recorded at the study site, as discussed below, a daytime $L_{Aeq\ 1\ h}$ criterion of 65 dB is recommended. This criterion is identical to that typically applied by local authorities, and is thus applied in this assessment. The $L_{Aeq\ 1\ h}$ parameter describes the total noise emissions from all construction sources occurring during any 1 h period, averaged over that hour. BS 5228:2009 states that the 65 dB criterion is applicable to the periods Monday-Friday 0700-1900 h and Saturday 0700-1300 h. Construction operations are unlikely to be undertaken during evening or night-time hours or on Sundays. This assessment therefore applies the 65 dB criterion in respect of all construction works.

The 65 dB criterion is considered applicable to surrounding receptors, in their immediate curtilage. In this regard, the EPA document *NG4 Guidance note for noise: Licence applications, surveys and assessments in relation to scheduled activities* (2016) defines a noise sensitive location as:

Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires absence of noise at nuisance levels.

As construction projects tend to be relatively short, and as construction areas are usually localised and mobile, the 65 limit is usually not subject to any additional criteria such as tone and impulse restrictions.

Construction noise criteria set out in the National Roads Authority (now TII) document *Good practice guidance for the treatment of noise during the planning of national road schemes* (2014) are occasionally applied to non-road projects, particularly in relation to temporary louder activities. The document recommends a daytime $L_{Aeq\ 1\ h}$ criterion of 70 dB at receptors, marginally higher than the 65 dB BS 5228:2009 criterion. In this case, the NRA limit is considered relevant to specific construction operations which may generate elevated noise levels over a short period, bearing in mind that permitting isolated periods of intense activity may eliminate the need for more drawn out and less efficient construction methods.

2.2 Construction phase vibration

As with noise, there are no national limits relating to groundborne vibration, and reference is usually made to guidance set out in *British Standard BS 5228-2:2009+A1:2014 code of practice for noise and vibration control on construction and open sites – Part 2: Vibration* (2014). Table 1 presents guidance included in the document with respect to human perception of peak particle velocity (PPV), the most commonly applied descriptor of groundborne vibration.

PPV	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10.0 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

Table 1 Human perception of vibration, from BS 5228-2:2009

During construction projects, reference is usually made to criteria relevant to buildings, in order to avoid potential cosmetic or structural damage. The National Roads Authority document identified above is often applied to non-road projects due to the absence of any other Irish guidance. NRA criteria, listed in Table 2, are informed by documents such as *British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration* (1993). The criteria apply at the closest part of any relevant building or structure.

Frequency	<10 Hz	10-50 Hz	>50 Hz
PPV	8 mm/s	12.5 mm/s	20 mm/s

Table 2 Building vibration criteria, from NRA (2014)

NRA limits set out above are considerably lower than criteria recommended by two international authorities, as presented in Table 3. The criteria presented are those below which cosmetic damage (hairline cracking, etc.) to buildings is unlikely to occur. Limits relating to structural damage are significantly higher.

Structure	Lower frequencies	Higher frequencies	Source
Modern dwellings	<40 Hz: 19 mm/s	>40 Hz: 51 mm/s	1
Older dwellings	<40 Hz: 12.7 mm/s	>40 Hz: 51 mm/s	1
Industrial & heavy commercial	4-15 Hz: 50 mm/s	>15 Hz: 50 mm/s	2 & 3
Residential & light commercial	4-15 Hz: 15-20 mm/s	>15 Hz: 20-50 mm/s	2 & 3

Table 3 Recommended vibration limits

Sources:

[1]*US Bureau of Mines report RI 8507: Structural response and damage produced by ground vibration from surface mines blasting* (1980).

[2]*BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration* (2014).

[3]*BS 7385-02: 1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration* (1993).

2.3 Operational noise

2.3.1 Absolute criteria

There are no national mandatory noise limits applicable to commissioned developments. With respect to commercial noise emissions, most environmental noise guidance documents issued across Europe ultimately derive limits from guidance issued by the World Health Organisation. The WHO document *Guidelines on community noise* (1999) sets out guideline values considered necessary to protect communities from environmental noise. With respect to residential settings, the document notes that an outdoor $L_{Aeq\ 16\ h}$ level of 55 dB is an indicator of serious annoyance during daytime and evening hours, with 50 dB being an indicator of moderate annoyance.

The 55 dB criterion has become the de facto daytime limit applied by most Irish regulatory authorities to commercial and industrial operators. Although the WHO criterion applies to daytime periods of 16 hours, authorities typically specify shorter periods, and thus limits such as $L_{Aeq\ 15\ min}$, $L_{Aeq\ 30\ min}$ and $L_{Aeq\ 1\ h}$ are variously applied. In issuing licences to industrial facilities, the EPA typically specifies a daytime $L_{Aeq\ T}$ limit of 55 dB at receptors. The EPA considers that daytime to refer to 0700-1900 h. A similar daytime limit is usually included in noise conditions attached to planning permission issued by local authorities.

The WHO's 1999 guidance document recommends an external night-time criterion of 45 dB to prevent sleep disturbance. Although the WHO document *Night noise guidelines for Europe* (2009) makes reference to a 40 dB night-time criterion, this relates to the $L_{night,outside}$ parameter, which is the long term average measured throughout a whole year. The 45 dB criterion is considered more appropriate for short term measurement intervals. As before, $L_{Aeq\ 15\ min}$, $L_{Aeq\ 30\ min}$ and $L_{Aeq\ 1\ h}$ night-time intervals are variously applied by regulatory authorities, rather than the 8 hour period to which the WHO's 45 dB criterion applies. The EPA considers that night-time refers to 2300-0700 h.

Neither of the WHO documents identified above makes reference to evening periods, and indeed their 1999 document assumes that daytime extends to 2300 h. However, a trend towards the separate assessment of evening impacts is currently evident, partly driven by the EPA's NG4 document. The original 2012 version of the document introduced the evening period 1900-2300 h. The NG4 document recommends an evening criterion of 50 dB, applicable externally at receptors.

Many authorities require that a penalty be added to measured noise levels where emissions are tonal and/or impulsive. NG4 specifies the addition of a 5 dB penalty to site specific $L_{Aeq\ T}$ levels measured during daytime or evening hours. During night-time hours, the EPA prohibits tones and impulses entirely, stating that such characteristics should not be 'clearly audible or measurable'.

The above criteria, drawn from NG4 and summarised in Table 4, are considered relevant to noise sources at the proposed development. Rather than allowing daytime and evening levels to be rated for tonal or impulsive features, the table assumes that such features are avoided at all times. Criteria apply externally at receptors.

Period	Parameter	Limit
0700-1900 h	$L_{Aeq\ T}$	55 dB
1900-2300 h	$L_{Aeq\ T}$	50 dB
2300-0700 h	$L_{Aeq\ T}$	45 dB

Table 4 NG4 noise criteria

The proposed development will require an industrial emissions licence from the EPA. In assessing the licence application, the EPA is likely to have regard to their NG4 document, and to criteria set out in Table 4. The existing waste management facility at the applicant's site is currently subject to noise

limits set out in waste licence W0039-02 issued 04.09.00. Schedule F.4 of the licence specifies a daytime $L_{Aeq\ 30\ min}$ limit of 55 dB and a night-time $L_{Aeq\ 30\ min}$ of 45 dB, applicable at station NS1 located opposite the site entrance. Any future industrial emissions licence issued by the agency is likely to add an evening limit of 50 dB.

The NG4 document includes a methodology to derive lower limits where a site is located in a 'quiet area' or an 'area of low background noise'. The proposed development site is not located in a quiet area, being situated in the Dublin urban area. Noise levels measured in the local area, as discussed below, indicate that the development site is also not located in an area of low background noise. Thus lower criteria are not warranted, and Table 4 criteria are considered relevant to this assessment.

2.3.1 Relative criteria

In addition to the absolute criteria set out in Table 4, the impact of noise emissions from commercial sources may be assessed by reference to relative criteria. The most commonly applied standard here is *British Standard BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound* (2019) which provides for the comparison of specific $L_{Aeq\ T}$ levels (i.e. noise levels attributable to the source in question) with background levels, and provides an indication of impact depending on the difference. Specific levels may be rated to take tonal, impulsive and other characteristics into account. The standard notes that the background noise environment may include existing industrial emissions unrelated to the specific source.

BS 4142:2014 states that a difference of 10 dB or more between specific and background levels is indicative of a significant adverse impact. A difference of 5 dB suggests an adverse impact, with lower differences suggesting reduced impacts. The standard adds that the perception of impact will be increased or reduced depending on local context.

Noise impacts may also be assessed by reference to *Guidelines for environmental noise impact assessment* (Institute of Environmental Management and Assessment, 2014) (IEMA) which sets out guidance on impacts by comparison with ambient levels. Table 5 sets out a scale adapted from IEMA and EPA guidance. The table is considered relevant to total ambient $L_{Aeq\ T}$ levels i.e. $L_{Aeq\ T}$ levels attributable to the proposed development may be compared to existing $L_{Aeq\ T}$ levels.

Change	Impact	Effect
<2 dB	Imperceptible	Capable of measurement, but without significant consequences
2-4 dB	Not significant	Causes noticeable changes to soundscape, but without significant consequences
4-6 dB	Slight	Causes noticeable changes to soundscape without affecting its sensitivities
6-10 dB	Moderate	Alters soundscape in manner consistent with existing and emerging baseline trends
10-15 dB	Significant	Alters soundscape due to source character, magnitude, duration or intensity
15-20 dB	Very significant	Significantly alters soundscape due to source character, magnitude, duration or intensity
>20 dB	Profound	Obliterates soundscape

Table 5 Assessment of impact by reference to increase over existing noise levels

Local offsite receptors are currently subject to existing traffic noise levels on the surrounding road network. The proposed development will increase traffic volumes locally, with a consequent increase in traffic noise levels. The *Design manual for roads and bridges* (UK Highway Agency, 2011) notes that the resulting noise impact is linked to the magnitude of the noise increase. Table 6 sets out the DMRB

guidance. Included in the table are impact categories listed by the EPA in their 2022 document *Guidelines on the information to be contained in environmental impact assessment reports*.

Increase	Subjective reaction	DMRB impact	EPA impact
0 dB	None	No change	Neutral
0-3 dB	Imperceptible	Negligible	Imperceptible to not significant
3-5 dB	Perceptible	Minor	Not significant to slight
5-10 dB	Up to a doubling of loudness	Moderate	Slight to moderate
>10 dB	Doubling of loudness or greater	Major	Significant to profound

Table 6 DMRB assessment guidance

2.4 Noise action plan

The *Dublin agglomeration action plan relating to the assessment and management of environmental noise December 2018 – November 2023 (noise action plan) – Volume 4: South Dublin County Council* (South Dublin County Council, 2018) describes a strategic plan based on noise mapping undertaken in 2017 ('round 3' mapping). Preparation of the plan is a requirement of *Directive 2002/49/EC of the European Parliament and of the Council relating to the assessment and management of environmental noise* (2002), transposed into Irish law by the *European Communities (Environmental Noise) Regulations 2018* (SI No. 549/2018). The Directive requires preparation of noise plans for all roads with annual traffic volumes over 3 million vehicles. The nearest major road is the M50 motorway 320 m to the west of the applicant's site.

Round 4 noise mapping has been undertaken, and the local authority noise action plan is currently being updated. In the meantime, Table 7 sets out 2018-2023 noise action plan criteria for the assessment of traffic noise mitigation.

Objective	L_{day}	L_{night}
Threshold for undesirable high sound levels	>70 dB	>55 dB
Threshold for desirable low sound levels	<55 dB	<50 dB

Table 7 SDCC 2018-2023 noise action plan criteria for traffic noise mitigation

The local soundscape is entirely dominated by road traffic noise, and the proposed development will not have any implications for the SDCC noise action plan. While the noise action plan includes criteria for the identification of a 'quiet area in an agglomeration', it is noted that noise levels across the study site, as discussed below, considerably exceed these criteria, and thus the study site is not a quiet area.

3 Receiving environment

3.1 Location

The proposed development site consists of an approximately square plot, 1.25 ha in area, adjacent to Ballymount Road Upper, Tallaght, Dublin 24. The southwest boundary is formed by the road. The northwest boundary adjoins two commercial premises, while the southeast boundary is formed by a commercial estate roadway serving a number of premises. The rear (northeast) boundary adjoins a plot currently undergoing development permitted through planning permission SD22A/0099 for five warehouse units (as amended by SD23A/0127). Application SD23A/0179 seeks to add an additional three units at an adjacent site.

Directly opposite the proposed development site lies a large commercial building divided into a number of units. The proposed development site is located in an extensively industrial area, as shown in Figure 1, with commercial and industrial buildings extending for several hundred metres in each direction. The local topography is level.

Figure 1 Site location, with site bordered yellow N

3.2 Receptors

Despite the site's location in an industrial area, there are six dwellings locally, all situated along Ballymount Road Upper to the southeast of the site entrance. Several of these are connected with immediately adjacent commercial activities. The dwellings are shown in Figure 2. A dwelling outside the northwest corner of the proposed development site does not appear to be in residential use.

Apart from the six dwellings identified above, there are no other residential receptors in proximity to the proposed development site. The nearest dwellings are located 400 m to the west, on the western side of the M50 motorway, where a number of residential estates border the motorway. The nearest of several dwellings on Turnpike Road to the northwest lies 430 m from the site. The nearest dwellings to the south are over 600 m from the site. Extensive residential estates to the east and southeast approach to within 700 m of the site at their closest.

All receptors in the wider area are dwellings. No receptors such as creches, schools, care centres or nursing homes have been identified in the local area. Commercial and industrial facilities (including their office spaces) across the surrounding area are not considered noise sensitive locations.

Figure 2 Local dwellings in residential use circled white N

3.3 Noise mapping

The South Dublin County Council noise action plan 2018-2023 referenced above includes maps relating to the road network in the vicinity of the site, as required by Directive 2002/49/EC. Round 4 mapping has been completed recently, and the noise action plan is currently undergoing review. Round 4 road traffic noise mapping for the local area is shown in Figures 3 and 4. Mapped L_{den} levels exceed 55 dB along Ballymount Road Upper. L_{night} levels are generally above 50 dB, and considerably above 60 dB along the M50 corridor. In the vicinity of the proposed development site, noise levels do not exceed the South Dublin County Council threshold for undesirable high sound levels. While the round 4 maps include mapping of noise contours associated with industrial facilities, it is not clear how these have been calculated, or how such data will be incorporated into future noise action plans.

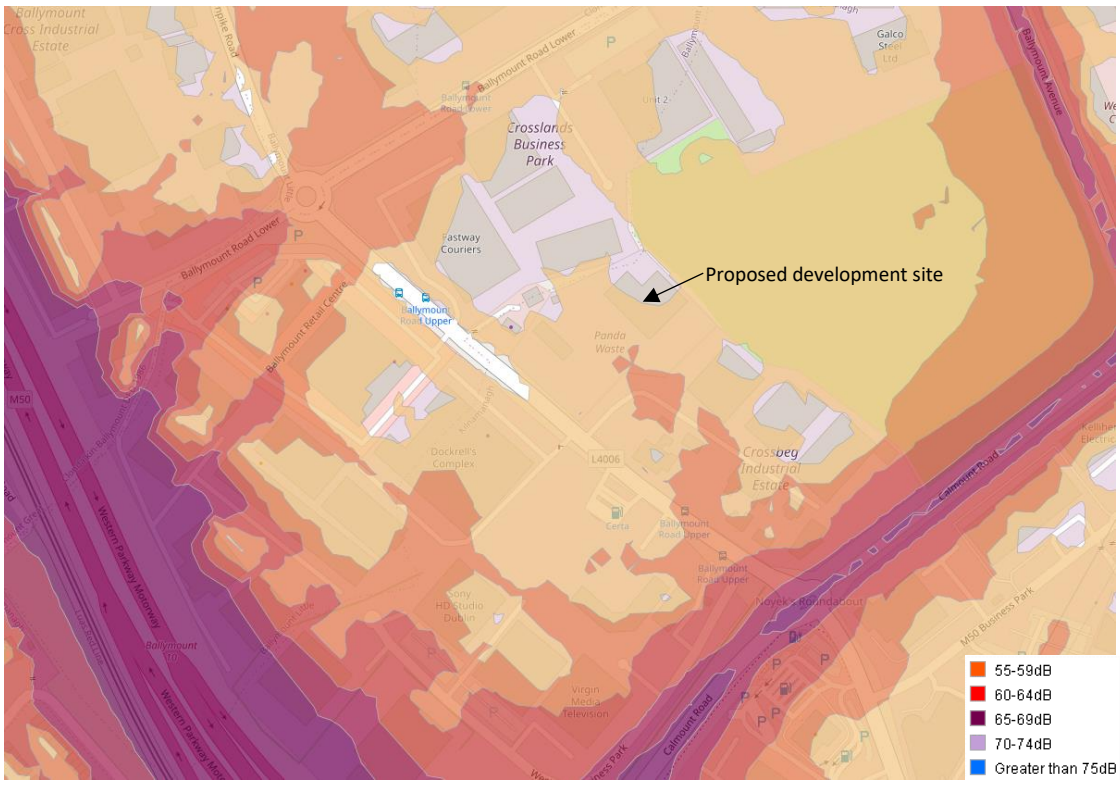


Figure 3 Mapped L_{den} contours N

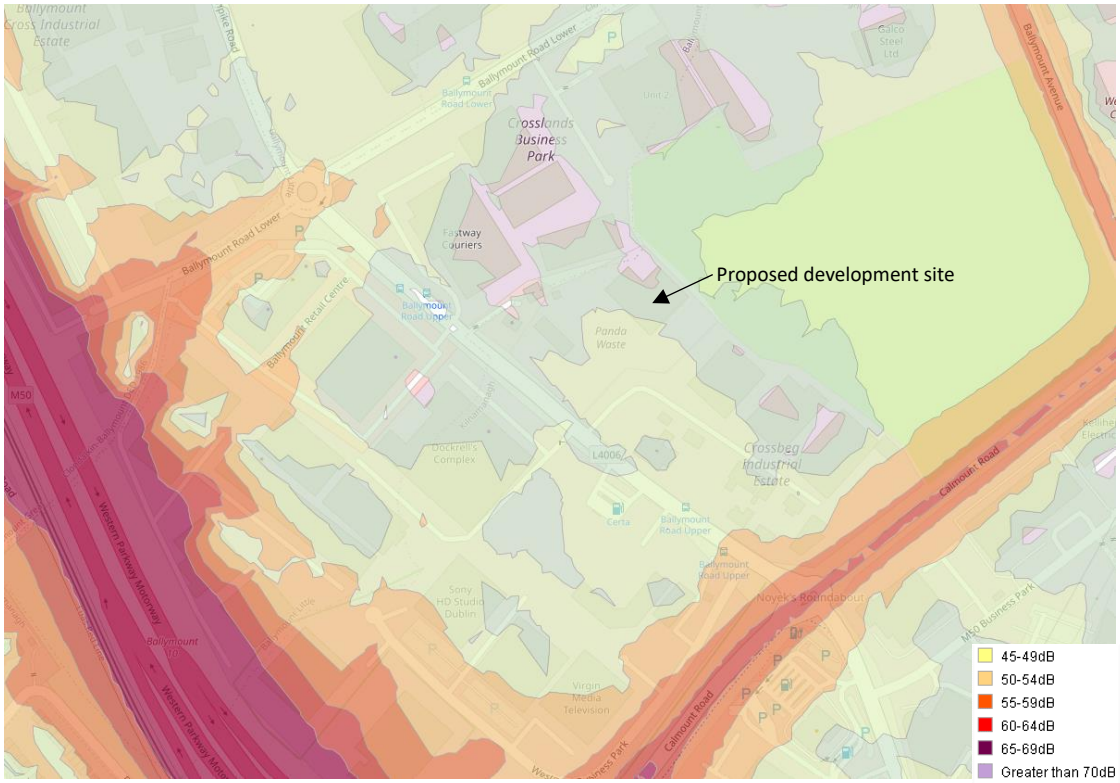


Figure 4 Mapped L_{night} contours N

3.4 Historic monitoring data

The applicant's existing facility is regulated by the EPA through waste licence W0039-02. Annual noise surveys are required by the licence, with four monitoring points specified as shown in Figure 5. Noise data measured during the 2020, 2021 and 2022 surveys are listed in Table 8.

Measured noise data indicate that $L_{Aeq\ T}$ levels in the vicinity of the proposed development site are elevated, with $L_{Aeq\ 30\ min}$ levels reaching 62 dB in proximity to Ballymount Road Upper. Night-time levels reach 54 dB. $L_{AF90\ 30\ min}$ levels show considerable variation, reaching 58 dB by day and 47 dB by night. Information presented in the three noise reports confirm that measured noise data at roadside positions are entirely dominated by local and distant traffic.

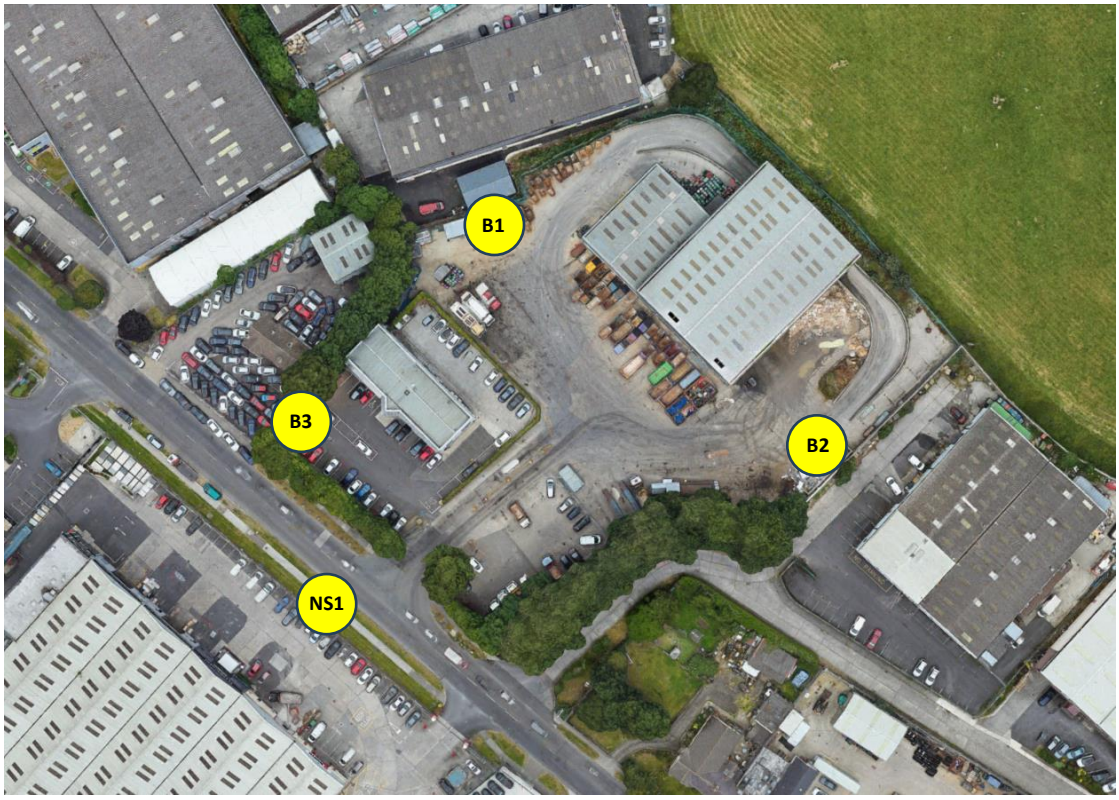


Figure 5 Routine noise monitoring stations for waste licence N

Date	Period	Parameter	B1	B2	B3	NS1
16.07.20	Daytime	Ambient $L_{Aeq\ 30\ min}$ (dB)	59-60	55-60	59	61-62
		Specific $L_{Aeq\ 30\ min}$ (dB)	<55	<55	<55	<55
		$L_{AF90\ 30\ min}$ (dB)	55-56	52-54	54-55	58
	Night-time	Ambient $L_{Aeq\ 30\ min}$ (dB)	51-54	59-63	52-60	52
		Specific $L_{Aeq\ 30\ min}$ (dB)	<45	<45	<45	<45
		$L_{AF90\ 30\ min}$ (dB)	45-47	43-45	46-47	45
03.03.21	Daytime	Ambient $L_{Aeq\ 30\ min}$ (dB)	56-51	55-57	60-61	60
		Specific $L_{Aeq\ 30\ min}$ (dB)	<55	<55	<55	<55
		$L_{AF90\ 30\ min}$ (dB)	47-49	50-53	52-53	52
	Night-time	Ambient $L_{Aeq\ 30\ min}$ (dB)	43	42-44	51-52	54
		Specific $L_{Aeq\ 30\ min}$ (dB)	<45	<45	<45	<45
		$L_{AF90\ 30\ min}$ (dB)	39-40	40-41	37	37
10.06.22	Daytime	Ambient $L_{Aeq\ 30\ min}$ (dB)	63-66	61-64	59-61	60-61
		Specific $L_{Aeq\ 30\ min}$ (dB)	<55	<55	<55	<55
		$L_{AF90\ 30\ min}$ (dB)	53-56	53-55	54-56	55-56
	Night-time	Ambient $L_{Aeq\ 30\ min}$ (dB)	50-51	52-53	57	51-53
		Specific $L_{Aeq\ 30\ min}$ (dB)	<45	<45	<45	<45
		$L_{AF90\ 30\ min}$ (dB)	48-49	48	51-52	47

Table 8 Previous noise survey results. See glossary for definitions

3.5 Current noise data

In order to assess current daytime, evening and night-time noise levels in the vicinity of the nearest receptors, a survey was carried out on Thursday 21.09.23, extending into Friday morning 22.09.23. Monitoring was undertaken at two positions shown in Figure 6 and Photographs 1 and 2, and described in Table 9. Survey methodology, equipment specifications and weather conditions are listed in Table 10. Recorded time history profiles are shown in Figures 7 to 12. Noise data are presented in Table 11.

Figure 6 Baseline noise survey stations N

Station	NGR	Location	Reason for selection
N1	709628 730215	Corner of service station on Ballymount Road Upper, 85 m SE of site	To represent local cluster of dwellings
N2	709079 730306	Grassed area 18 m N of dwellings at Kingswood Mews, 440 m W of site	To represent Kingswood Mews, closest dwellings to site outside of local cluster on Ballymount Road Upper

Table 9 Baseline noise survey stations

Photograph 1 N1, looking southeast towards nearest dwellings

Photograph 2 N2, looking south to dwellings at Kingswood Mews

Factor	Details
Cloud cover	Daytime: 0 %; Evening: 90 %; Night-time: 50 %
Temperature	Daytime: 14 °C; Evening: 12 °C; Night-time: 11 °C
Precipitation	0 mm
Wind direction	NW
Wind speed	0-3 m/s throughout
Wind speed meas.	Handheld anemometer at 2 m height
Survey operator	Damian Brosnan MSc MIOA
SLM details	Unit: DB5; Type: NTi XL2; Serial: A2A-17932-E0; Verification: 17.02.22
Field calibration	Date: 21.09.23; Time: 1036; Sensitivity: 41.1 mV/Pa
Calibrator	Type: Bruel & Kjaer Type 4231; Serial: 2342544; Verification: 10.05.23
Verification	NSAI; Verification certificates available on request
Survey operator	Damian Brosnan BSc MSc MIOA MIEI

Table 10 Survey details

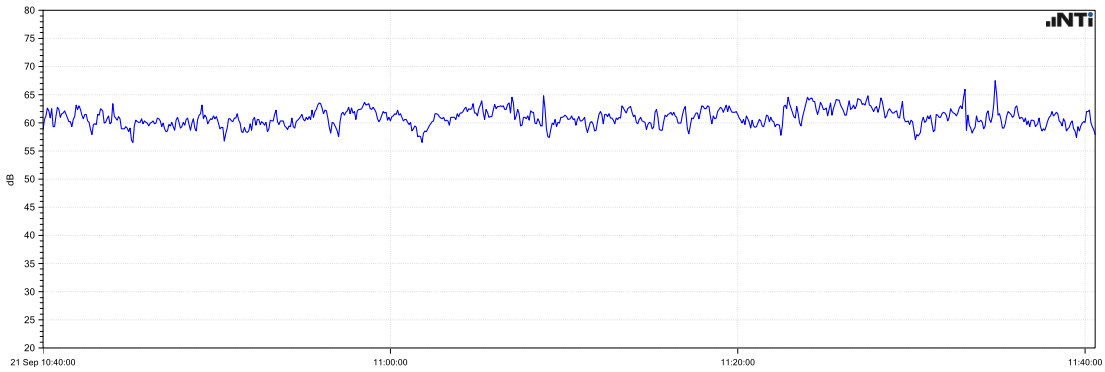


Figure 7 $L_{Aeq\ 1\ s}$ profile – N1 daytime

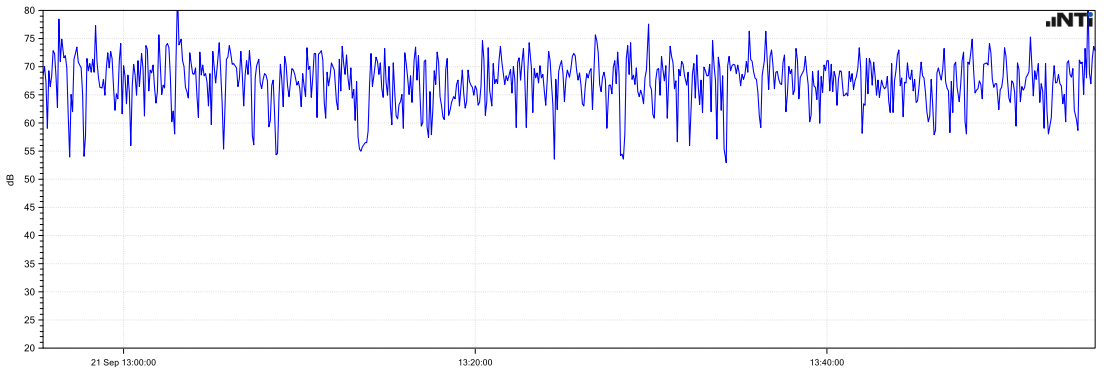


Figure 8 $L_{Aeq\ 1\ s}$ profile – N2 daytime

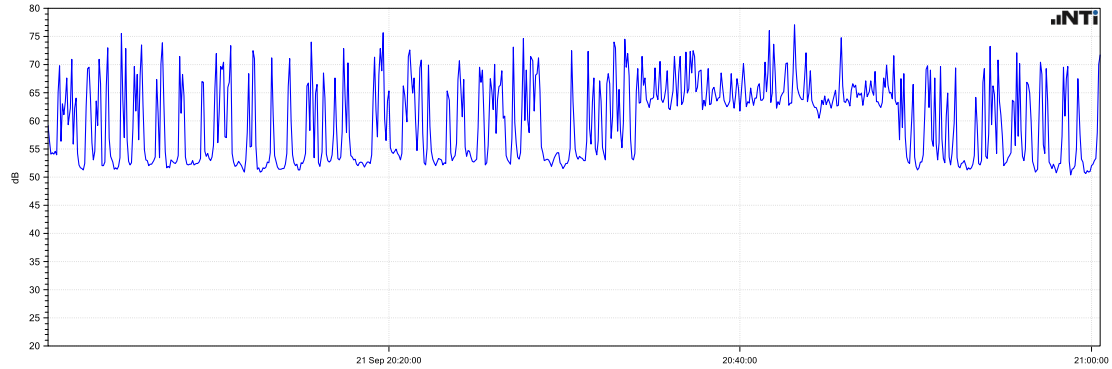


Figure 9 $L_{Aeq\ 1\ s}$ profile – N1 evening; Levels during the period 2030-2050 were affected by a continuous alarm at a nearby premises.

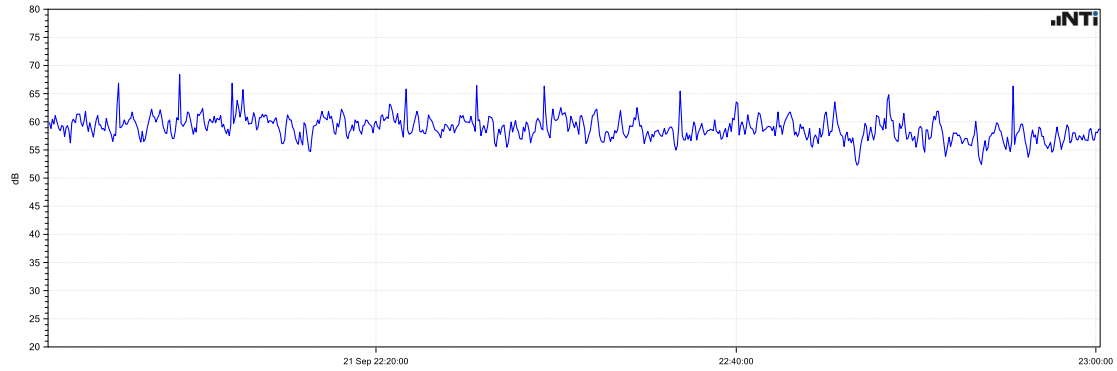


Figure 10 $L_{Aeq\ 1\ s}$ profile – N2 evening

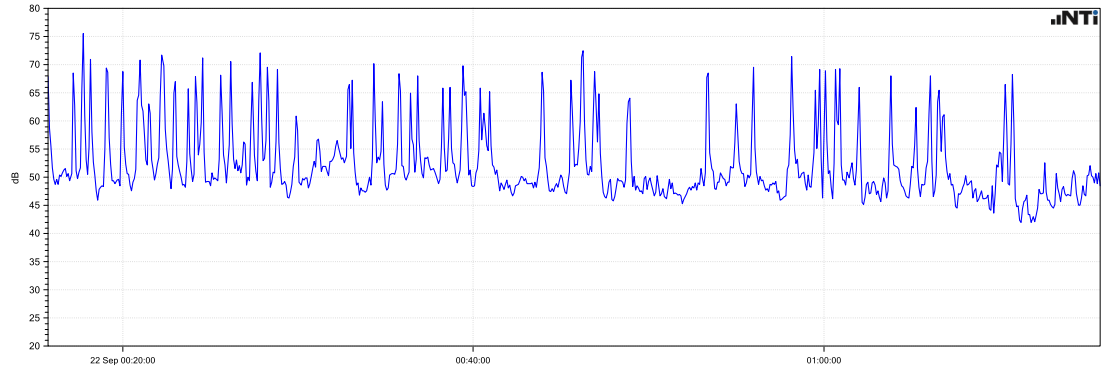


Figure 11 $L_{Aeq\ 1\ s}$ profile – N1 night-time

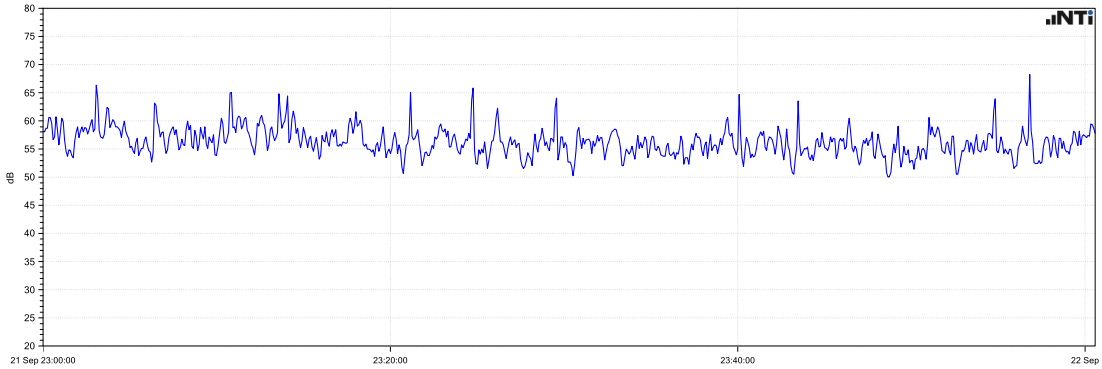


Figure 12 $L_{Aeq\ 1\ s}$ profile – N2 night-time

Station	Period	Interval	$L_{Aeq\ T}$ (dB)	$L_{AF10\ T}$ (dB)	$L_{AF90\ T}$ (dB)
N1	Daytime	1255-1325	70	73	59
		1325-1355	69	72	60
		1255-1255	69	73	60
	Evening	2000-2030	65	69	52
		2030-2100	66	69	52
		2000-2100	65	69	52
	Night-time	0015-0030	62	67	49
		0030-0045	58	60	48
		0045-0100	59	59	47
		0100-0115	57	57	45
		0015-0045	60	63	48
		0045-0115	58	58	46
N2	Daytime	1040-1110	61	63	59
		1110-1140	61	63	59
		1040-1140	61	63	59
	Evening	2200-2230	60	62	57
		2230-2300	59	61	55
		2200-2300	59	61	56
	Night-time	2300-2315	59	61	54
		2315-2330	57	59	52
		2330-2345	56	58	52
		2345-0000	56	58	52
		2300-2330	58	60	53
		2330-0000	56	58	52

Table 11 Baseline noise survey data. Different intervals are assessed as required by various standards.

The soundscape at both stations was entirely dominated by road traffic. At N1, local road traffic gave rise to recurring spikes, with elevated background levels due to continuous M50 traffic. In contrast, there were no local spikes at N2, and continuous M50 traffic dominated. Other sources audible were aircraft, Luas passes at N2, and an alarm event at N1. No emissions were audible from the applicant's existing operation. Measured noise levels are elevated at both positions, reflecting the dominance of local traffic noise adjacent to Ballymount Road Upper, and continuous M50 intrusion in the background.

3.6 Future trends

EPA EIAR guidance recommends that a noise impact assessment should include a description of the likely evolution of the future receiving acoustic environment in the absence of the proposed development. The local noise environment is urban in character, being entirely dominated by local and M50 road traffic noise on a 24/7 basis. Traffic volumes are likely to continue to increase into the future, resulting in gradually increasing noise levels. While engine noise emissions will reduce due to increasing take-up of electric vehicles, it is noted that traffic noise above 50 km/h arises chiefly from tyre noise and is thus unaffected by engine type. Thus the increasing proportion of electric vehicles in the national car fleet is unlikely to result in a decrease in traffic noise levels across the study site, particularly in relation to M50 noise.

Noise levels in the local area surrounding the proposed development site may increase marginally following completion of five warehouses currently under construction on a plot to the immediate east of the site.

With respect to the development site itself, it is expected that, should the proposed development not proceed (the 'do nothing' scenario), noise emissions will continue to arise from the existing onsite waste management operation, as licensed by the EPA.

4 Potential impacts

4.1 Do-nothing scenario

If the proposed development does not proceed, it is expected that the current onsite waste management operation will continue into the future, as permitted by planning permission and waste licence W0039-02. Any changes to onsite waste operations will require approval from the EPA, and will be subject to the agency assessment process.

4.2 Construction phase noise

The overall construction project is expected to last approximately 18 months, and will be managed from a temporary onsite compound. Construction hours will be 0800-1800 h Monday-Saturday. Construction works will include the following activities, undertaken variously throughout the construction phase and in different areas of the site:

- Installation of temporary site compound.
- Demolition of existing buildings and ancillary structures.
- Excavation of building foundations.
- Excavation and installation of underground attenuation tank.
- Installation of services.
- Steel frame erection.
- Pouring & floating of concrete floor slabs.
- Wall construction, cladding and roof work.
- Installation of waste segregation plant and conveyors.
- Installation of ancillary plant such as compressors and the air management plant.
- Acoustic barrier installation.
- Site finishing works and installation of ancillary infrastructure such as weighbridges.

During the construction phase, the chief source of noise emissions will be plant used onsite. Construction plant required onsite at various stages of the project are listed in Table 12. The table includes details of typical sound pressure levels, taken from BS 5228-1:2009.

Plant	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Total $L_{Aeq\ T}$
Discharging mixer truck	80	69	66	70	71	69	64	58	75
Tracked excavator (22 t)	80	83	76	73	72	70	69	66	78
Mobile elevated working platform	78	76	62	63	60	59	58	49	67
Mobile generator	78	71	66	62	59	55	56	49	65
Excavator with breaker	88	88	86	89	83	83	80	76	90
Crane (35 t)	80	76	71	63	64	63	56	50	70
Dumper	84	81	74	73	72	68	61	53	76
Vibro-roller	88	83	69	68	67	65	62	59	74
Telescopic handler	85	79	69	67	64	62	56	47	71
Truck (driving)	73	78	78	78	74	73	68	66	80

Table 12 Expected construction plant (dB at 10 m)

Noise emissions arising during the construction phase of the proposed development will vary considerably due to several reasons:

- Throughout the construction phase, plant associated with different activities will relocate around the site as required.
- Different plant will be required at different times, and construction operations will vary on a daily basis.
- Each machine may operate under different loading conditions or be in varying states of repair.
- Construction works may be concentrated for certain periods, followed by periods of inactivity. Localised works may require several hours of intense activity.
- During later stages of the construction phase, emissions from some operations will be screened by the building.

From the foregoing, it is clear that construction noise emissions will vary in time and location, and it is not possible to determine a single overall noise output figure for the construction phase. The most suitable approach here is to assess worst case scenario emissions arising from various stages of the project. For the purposes of predictive modelling, the following construction scenarios are assumed:

- Demolition stage, involving an excavator with a breaker attachment, a second excavator, and occasional truck movements.
- Ground works involving a tracked excavator, vibro-roller, dumper and sporadic truck movements, with a second excavator ripping rock to enable installation of the underground attenuation tank.
- Building construction works, involving a discharging concrete mixer truck, a mobile elevated working platform, a crane, a mobile generator, a telescopic handler, and sporadic truck movements.

Noise emissions from the above were modelled using DGMR iNoise Pro v2024 software. Input parameters were as follows:

- Model algorithm: *International Standard ISO 1996-2:2017 Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels* (2017).
- Ground character: Hard ground throughout.
- Receiver height: 2 m.
- Plant output data taken from Table 12. 31.5 Hz levels (not provided in BS 5228) assumed to be same as 63 Hz levels.

The model output is shown in Figures 13 to 15. Predicted $L_{Aeq\ 1\ h}$ levels at the nearest receptors are listed in Table Apart from one case, $L_{Aeq\ 1\ h}$ levels will remain below the 65 dB BS 5228:2009 criterion at all receptors throughout the construction phase. The single exception relates to the nearest dwelling outside the southeast corner of the site, where demolition works will reach 69 dB at their highest. This activity will be short-term, lasting several days at most. The predicted 69 dB level will not exceed the 70 dB criterion recommended by the National Roads Authority. On this basis, construction phase noise levels are unlikely to be intrusive. Construction phase noise impacts are expected to be temporary and slight adverse at the nearest dwelling, decreasing to temporary and imperceptible to not significant at other dwellings.

BS 5228:2009 source noise data suggest that construction phase emissions will not be tonal. Apart from concrete breaking, emissions are also unlikely to be impulsive. Breaking will be required over several days, estimated at 1-3 days. Due to masking by road traffic, construction phase noise is likely to be inaudible at distant dwellings, and slightly audible at intervals at the nearest dwellings on Ballymount Road Upper.

Receptor	Demolition	Groundworks	Building
Dwelling 40 m from SE corner	69	60	57
2 dwellings 100 m SE of site	52-53	46-48	<45
3 dwellings near roundabout	45-54	45-51	<45
Dwellings on W side of M50	<50	<40	<40
Dwellings on Turnpike Road	<45	<40	<35
Distant dwellings to SE	<45	<35	<35

Table 13 Predicted construction phase $L_{Aeq\ 1\ h}$ levels (dB)

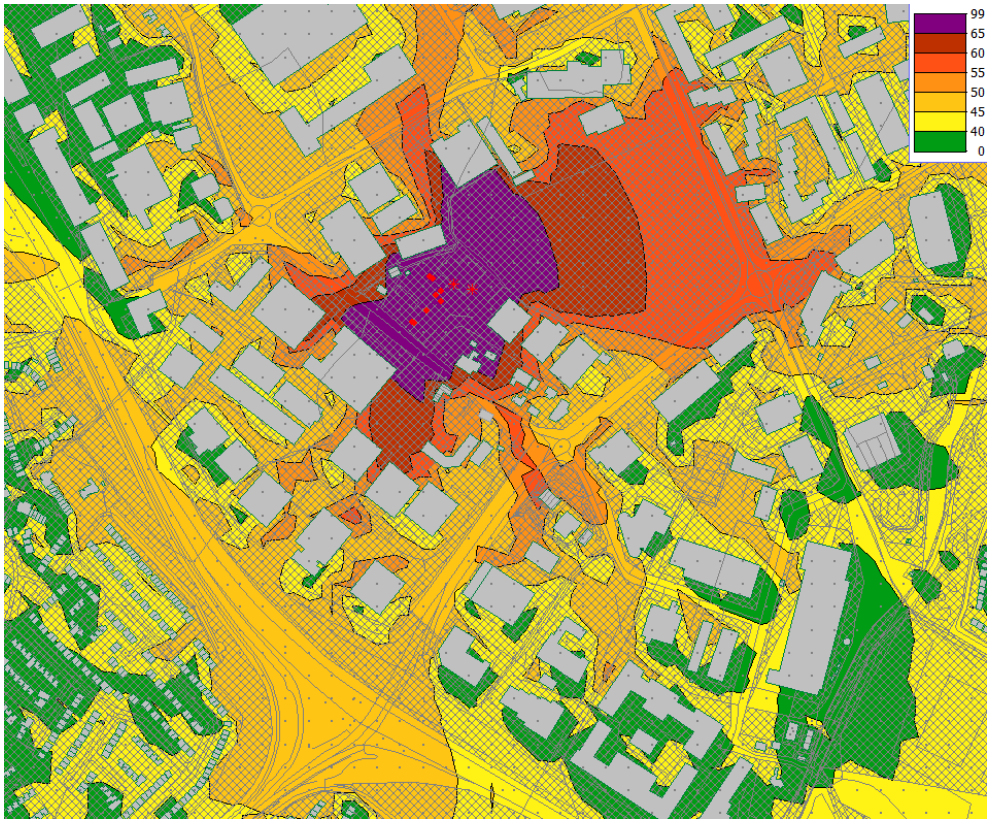


Figure 13 Predicted construction phase $L_{Aeq\ 1\ h}$ contours – demolition stage

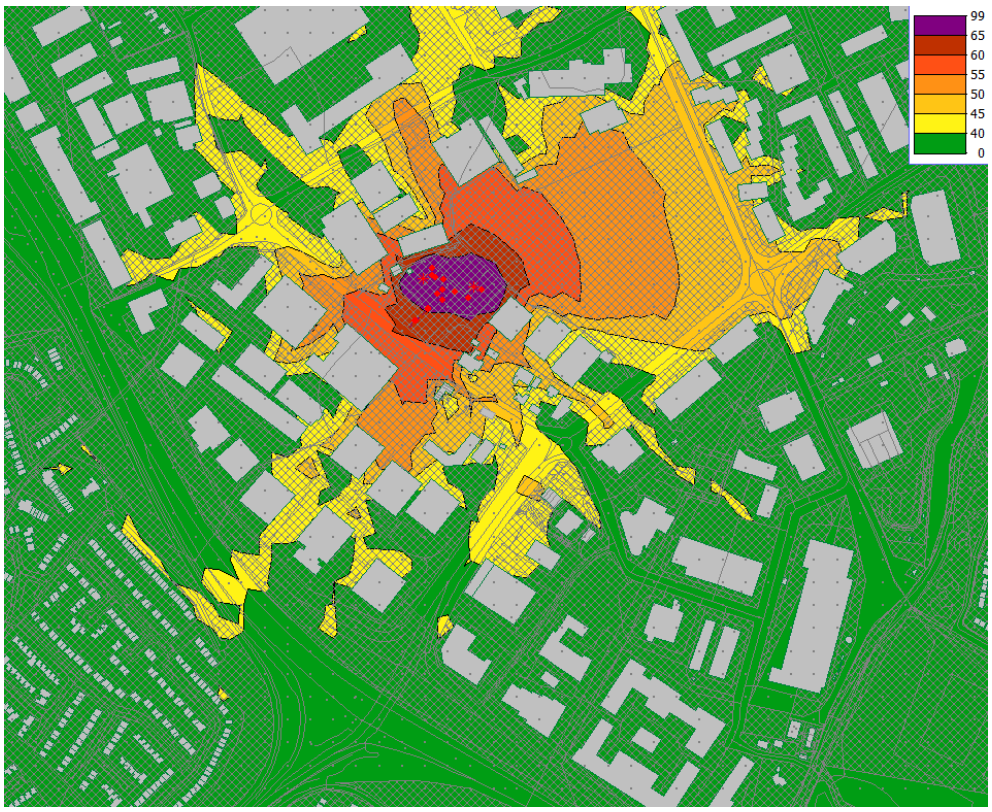


Figure 14 Predicted construction phase $L_{Aeq\ 1\ h}$ contours – groundworks stage

Figure 15 Predicted construction phase $L_{Aeq\ 1\ h}$ contours – building stage

4.3 Construction phase traffic noise

During the construction phase, vehicles will arrive at, and depart from, the site during the working day. Vehicle movements will be associated with workers' arrival and departure, removal of demolition waste, and delivery of materials. The approximate numbers of workers employed onsite over the entire construction period will fluctuate depending on schedules. Numbers are unlikely to exceed 60 at any time. The traffic impact assessment chapter indicates that construction works will result in a temporary increase in HGV traffic volumes of 7 % or less. It follows that construction traffic volumes will be inconsequential in the context of existing traffic volumes on Ballymount Road Upper and the surrounding road network, and also lower than traffic volumes associated with the applicant's existing onsite waste management operation. It is concluded that construction phase traffic noise impacts will be neutral.

4.4 Construction phase vibration

Potential sources of groundborne vibration during the construction phase are as follows:

- Delivery HGV movements: HGVs may give rise to vibration at positions adjacent to the road. However, such emissions are typically imperceptible beyond 10 m, and are highly unlikely to be perceptible at dwellings alongside site access routes. Ballymount Road Upper is currently subject to high HGV volumes throughout the day.
- Plant movements: The movement of plant onsite is not considered to constitute a source of groundborne vibration, and is not listed in typical vibration documents such as BS 5228-2:2009. In addition, plant machinery used onsite is likely to be small to mid-sized, and similar to those used on other urban construction projects.
- Vibro-rolling: While the vibro-roller will generate high levels of vibration at the point of operation, experience at other sites indicates that such vibration is typically immeasurable beyond 50 m.
- Ground works: Excavation of trenches and pits for foundations, services and a stormwater attenuation tank will be required. These activities are not typically associated with offsite groundborne vibration impacts. Piling is not proposed. In addition, rock breaking is unlikely to be required.
- Concrete breaking: Concrete breaking will be undertaken using a hydraulic breaker mounted on a tracked excavator. Although this activity may give rise to relatively high levels of ground vibration in proximity to the breaking area, the vibration tends to contain relatively little energy in the lower frequencies at which buildings and occupants are most vulnerable. In addition, higher frequencies attenuate more rapidly than low frequencies, thus minimising the impact zone. For this reason, most vibration guidance documents such as BS 5228-2:2009 ignore breaking vibration. Table 14 lists various PPV levels encountered at sites where hydraulic breaking (of rock) has been undertaken. The range in levels noted reflects variations in equipment power and rock type. With respect to occupants of buildings, groundborne vibration generally becomes noticeable around 1 mm/s PPV. With separation distances of over 50 m between breaking zones and the nearest residential receptor, groundborne vibration from the proposed development is not expected to be discernible at this dwelling or other receptors.

Distance (m)	5	10	20	50
PPV (mm/s)	0.2-4.5	0.06-3.0	0.02-1.5	0.1-0.3

Table 14 Reported rock breaking vibration levels

On the basis of the foregoing, PPV levels at all receptors are expected to be considerably lower than criteria listed in Tables 1, 2 and 3, and indeed are expected to be below measurement threshold. It

follows that construction operations are unlikely to be perceptible offsite, or to cause cosmetic or structural damage to buildings.

4.5 Operational noise emissions

The proposed development is summarised in the EIAR. The development will consist of one building within which all waste management operations will be undertaken. Skip waste and MSW will be imported to the building by HGV, passing through a weighbridge on entry and exit. Within the building, tipped waste will be loaded into a hopper, and from there will be conveyed through a series of stationary processing lines which will variously include trommels, shredders, optical separators, density separators, magnets, eddy current separators, wind sifters, picking lines, compactor units and bale wrapping units. Some initial sorting of waste may be undertaken using a mobile grab. The hopper will be loaded using the grab or a front end loader.

Processed waste will be removed offsite by HGV at intervals, and will be variously compacted, baled or left loose, depending on the waste stream. Management of bales, and HGV loading, will be carried out using a second front end loader or grab, in addition to a telescopic loader.

Negative air pressure will be maintained in the building using an air management system which will also include an odour control unit. This system will be installed at the northeast corner of the building, and will discharge through a 15.3 m stack. In order to maintain negative air pressure, the building will be entirely closed, with access through fast acting roller shutter doors which will open only to allow ingress and egress. Three doors on the southeast façade will allow inward waste delivery, while three northeast facing doors on an annex will allow waste export. The proposed site layout is shown in Figure 16. Preliminary noise modelling indicates the requirement for an acoustic barrier along the southeast boundary, extending to a height of 4 m, and this has been incorporated in the design layout.

Figure 16 Proposed site layout N

No external activities will be undertaken, apart from truck movements on the yard and car parking. Limited space will be set aside at the northeast corner for trailer parking and skip storage. No emissions will arise from a proposed electrical room. A back-up generator, if installed, will be used only during power outages, and will not constitute a routine noise source.

The site will be accessed at intervals throughout the day by HGVs. The number of HGV deliveries to the site is expected to average 390 each day, equivalent to 780 movements. The majority of these will arise during daytime hours. For the purposes of this assessment, the following split is assumed:

- 0700-1900: 90 % (700 movements).
- 1900-2300: 5 % (40 movements).
- 2300-0700: 5 % (40 movements).

The site is currently accessed by 167 trucks per day. The proposed development will result in a 133 % increase in site truck activity. All vehicles will enter and exit the site via a new entrance constructed 15 m southeast of the existing entrance. Employees will park in a carpark inside the roadside boundary. In the context of existing traffic noise in the local area, noise emissions from employee car movements will be negligible.

It is proposed to undertake waste management operations on a 24/7 basis. Thus operations in the building will be carried out through the evening and night-time. Vehicle movements will also arise on a 24/7 basis, subject to permission, although traffic movements during the evening and night-time will be sporadic.

Expected noise emissions associated with the above sources are listed in Table 15.

Plant	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Total $L_{Aeq\,T}$
MRF internal operations[1]	79	82	84	83	80	76	78	73	68	84
Mobile grab[2]	64	64	60	63	64	62	57	51	45	66
Telescopic loader[3]	85	85	79	69	67	64	62	56	47	71
Air management plant[4]	89	75	72	71	71	67	65	61	61	73
HGV[5]	73	73	78	78	78	74	73	68	66	80

Table 15 Operational plant noise emissions (dB, band levels Z-weighted)

Data source:

[1]Reverberant $L_{zeq\,T}$ levels measured in building at similar facility operated by applicant (processing lines and front end loader) in Dublin measured 2021 by Damian Brosnan.

[2]Wheeled excavator $L_{zeq\,T}$ at 10 m, from BS 5228:2009. 31.5 Hz value assumed to be same as 63 Hz value.

[3]$L_{zeq\,T}$ at 10 m, from BS 5228:2009. 31.5 Hz value assumed to be same as 63 Hz value.

[4]Noise emissions data are currently unavailable for the proposed odour control unit. Data measured at other sites suggest a typical A-weighted sound power level of 72-74 dB. Spectral data are unavailable, and data from a cooling tower are applied pro rata here, given that both sources generate a similar broadband spectrum.

[5]HGV $L_{zeq\,T}$ at 10 m, from BS 5228:2009. 31.5 Hz value assumed to be same as 63 Hz value.

For the purposes of predictive modelling, three scenarios were identified:

- Daytime: Waste management operations underway in the building, with the grab, front end loader and telescopic loader all in use. Air management system operating continuously. 60 HGV movements per hour assumed.
- Evening: As during the daytime, with HGV movements reducing to 10 movements per hour.
- Night-time: As during the evening, with HGV movements further reducing to 5 per hour.

Noise levels associated with the three scenarios were modelled using DGMR iNoise Pro v2024 software. Five warehouses currently under construction to the immediate east of the proposed

development site, permitted through permission SD22A/0099, were added to the noise model. Model input parameters were as follows:

- Model algorithm: *International Standard ISO 9613-2:1996 Acoustics: Attenuation of sound during propagation outdoors – Part 2: General method of calculation* (1996).
- Ground character: Hard ground throughout.
- Receiver height: 2 m.
- Plant output data taken from Table 15. 31.5 Hz levels (not provided in BS 5228) assumed to be same as 63 Hz levels.
- Building envelope: Insulated 50 mm Kingspan cladding assumed (facades and roof), over a mass concrete wall. Sound reduction index values taken from Kingspan specifications sheet.
- Doors: One roller shutter door open for 50 % of any interval on the southeast façade.

The model output is shown in Figures 17 to 19. Predicted $L_{Aeq\ 30\ min}$ levels at the nearest dwellings are presented in Table 16.

Figure 17 Predicted operational phase $L_{Aeq\ 30\ min}$ levels – Daytime N

Figure 18 Predicted operational phase $L_{Aeq\ 30\ min}$ levels – Evening N

Figure 19 Predicted operational phase $L_{Aeq\ 30\ min}$ levels – Night-time N

Receptor	Daytime	Evening	Night-time
Dwelling 40 m from SE corner	54	47	45
2 dwellings 100 m SE of site	47-48	41-42	40-41
3 dwellings near roundabout	39-41	32-34	30-32
Dwellings on W side of M50	≤40	≤33	≤31
Dwellings on Turnpike Road	≤32	≤28	≤28
Distant dwellings to SE	≤33	≤27	≤26

Table 16 Predicted $L_{Aeq\ 30\ min}$ levels at receptors (dB)

4.6 Operational noise impacts

Predicted operational phase $L_{Aeq\ 30\ min}$ levels may be assessed in light of three sets of criteria. The first of these relates to criteria recommended by the EPA, based on WHO guidance, as set out in Table 4 above. An assessment of compliance with these criteria is presented in Table 17. The assessment indicates that the proposed development will comply with EPA criteria at the nearest dwellings. Levels will also comply at more distant dwellings.

Receptor	Period	Predicted $L_{Aeq\ 30\ min}$	Criterion	Compliance
Dwelling 40 m from SE corner	Daytime	54	55	✓
	Evening	47	50	✓
	Night-time	45	45	✓
2 dwellings 100 m SE of site	Daytime	47-48	55	✓
	Evening	41-42	50	✓
	Night-time	40-41	45	✓
3 dwellings near roundabout	Daytime	39-41	55	✓
	Evening	32-34	50	✓
	Night-time	30-32	45	✓
Dwellings on W side of M50	Daytime	≤40	55	✓
	Evening	≤33	50	✓
	Night-time	≤31	45	✓
Dwellings on Turnpike Road	Daytime	≤32	55	✓
	Evening	≤28	50	✓
	Night-time	≤28	45	✓
Distant dwellings to SE	Daytime	≤33	55	✓
	Evening	≤27	50	✓
	Night-time	≤26	45	✓

Table 17 Operational phase $L_{Aeq\ 30\ min}$ levels v EPA criteria (dB)

The second assessment method relates to BS 4142:2014 which provides for the comparison of specific $L_{Aeq\ T}$ levels (i.e. noise levels attributable to the source in question) with background levels. Table 18 presents this assessment. Background levels are taken from Table 11 (lowest values applied as worst case scenario), with levels measured on Ballymount Road Upper considered reasonably representative of levels on Turnpike Road. Distant dwellings to the southeast are not included in this assessment as they lie beyond audible range. In all cases, operational noise levels will be lower than background $L_{AF90\ T}$ levels, which at all receptors are dominated by road traffic. It follows that no adverse impacts will arise. It should be noted that BS 4142:2014 does not differentiate a separate evening period, and the assessment of a separate evening period here is applied in order to adopt an overly rigorous assessment.

Receptor	Period	Predicted $L_{Aeq\ 30\ min}$	Background $L_{AF90\ T}$	Impact
Dwelling 40 m from SE corner	Daytime	54	59	No impact
	Evening	47	52	No impact
	Night-time	45	45	No impact
2 dwellings 100 m SE of site	Daytime	47-48	59	No impact
	Evening	41-42	52	No impact
	Night-time	40-41	45	No impact
3 dwellings near roundabout	Daytime	39-41	59	No impact
	Evening	32-34	52	No impact
	Night-time	30-32	45	No impact
Dwellings on W side of M50	Daytime	≤40	59	No impact
	Evening	≤33	55	No impact
	Night-time	≤31	52	No impact
Dwellings on Turnpike Road	Daytime	≤32	59	No impact
	Evening	≤28	52	No impact
	Night-time	≤28	45	No impact

Table 18 Operational phase $L_{Aeq\ 30\ min}$ levels v BS 4142:2014 (dB)

Finally, the increase in $L_{Aeq\ 30\ min}$ levels arising from the proposed development may be assessed in light of IEMA and EPA impact assessment guidance. This assessment is presented in Table 19. Baseline $L_{Aeq\ 30\ min}$ levels are again taken from Table 11 (lowest value applied). In all cases, impacts will be imperceptible, again due to high existing baseline noise levels resulting from road traffic.

Receptor	Period	Predicted $L_{Aeq\ 30\ min}$	Baseline $L_{Aeq\ 30\ min}$	Combined	Increase	Impact
Dwelling 40 m from SE corner	Daytime	54	69	69	0	Imperceptible
	Evening	47	65	65	0	Imperceptible
	Night-time	45	57	57	0	Imperceptible
2 dwellings 100 m SE of site	Daytime	47-48	69	69	0	Imperceptible
	Evening	41-42	65	65	0	Imperceptible
	Night-time	40-41	57	57	0	Imperceptible
3 dwellings near roundabout	Daytime	39-41	69	69	0	Imperceptible
	Evening	32-34	65	65	0	Imperceptible
	Night-time	30-32	57	57	0	Imperceptible
Dwellings on W side of M50	Daytime	≤40	61	61	0	Imperceptible
	Evening	≤33	59	59	0	Imperceptible
	Night-time	≤31	56	56	0	Imperceptible
Dwellings on Turnpike Road	Daytime	≤32	69	69	0	Imperceptible
	Evening	≤28	65	65	0	Imperceptible
	Night-time	≤28	57	57	0	Imperceptible

Table 19 Operational phase $L_{Aeq\ 30\ min}$ levels v IEMA and EPA impact assessment guidance (dB)

4.7 Operational traffic noise

All vehicles will access the site from Ballymount Road Upper. Existing traffic movements, including HGV movements, are elevated on Ballymount Road Upper due to traffic associated with facilities across the wider commercial area. The road traffic assessment indicates that increases in local road traffic resulting from the proposed development will not be significant.

It is noted that the proposed development represents a continuation of the existing waste management operation onsite, albeit with a 133 % increase in HGV movements. The resulting increase in noise level will be 4 dB. With reference to Table 6, this represents a not significant to slight negative

impact. The increase will be negligible in the context of Ballymount Road Upper traffic volumes. The traffic assessment indicates that development-related HGV traffic will constitute less than 15 % of overall HGV traffic locally, and it is concluded that traffic noise impacts will be contextually imperceptible.

4.8 Cumulative noise impacts

Site inspections and baseline noise monitoring indicate that the local soundscape is entirely dominated by road traffic noise. While a number of commercial and industrial noise sources are located in the surrounding area, noise emissions from these represent a minor contributor to the soundscape. Receptors directly bordering certain premises may be influenced by intermittent yard activity at such premises – this chiefly applies to three dwellings near the roundabout to the southeast of the site, all of which are located in close proximity to commercial operators, including operators within the curtilage of the dwellings.

Predictive noise modelling indicates that noise emissions from the proposed development will be lower than baseline noise levels at receptors and thus cumulative impacts will not arise. This conclusion applies during daytime, evening and night-time hours. Baseline noise levels remain elevated through the night, thus masking emissions from the proposed development. It is further noted that most, if not all, surrounding operators do not operate during night-time hours, further minimising the possibility of cumulative impacts. While there is a possibility that night-time HGV movements may occur at the warehouses under construction to the east, there are no receptors in immediate proximity to same.

Given (a) the dominance of road traffic noise, (b) the minimal impact from existing operators, and (c) the negligible impact from the proposed operation, it is concluded that the proposed development will not give rise to any cumulative noise impacts of significance.

5 Mitigation

5.1 Construction phase

Groundborne vibration impacts will not arise during the construction phase. Apart from one exception, construction phase noise levels at receptors will be lower than the 65 dB criterion recommended by BS 5228:2009, and mitigation measures are not specifically warranted. The single exception relates to concrete breaking required during the demolition stage, which will result in an increase in $L_{Aeq\ 1\ h}$ levels to 69 dB at the nearest dwelling to the southeast. Although this level will exceed the 65 dB criterion by several decibels, two points are relevant here:

- Concrete breaking will be required over a limited period early in the construction phase, expected to last several days at most.
- At the nearest dwelling, breaking noise levels will comply with the 70 dB criterion recommended by the National Roads Authority, and considered an appropriate criterion here for brief localised works.

In order to minimise breaking noise impacts at the nearest dwelling, it is proposed to confine breaking activity to 0800-1800 h Monday to Friday, and this constitutes the chief construction phase mitigation measure. In addition, the applicant proposes to apply the following general measures throughout the construction phase:

- Construction operations will in general be confined to the periods Monday-Friday 0800-1800 h and Saturday 0800-1800 h. Concrete breaking will not be undertaken on Saturdays.
- Hooting will be prohibited onsite. Drivers of plant and vehicles will be instructed to avoiding hooting at all times.

- Plant used onsite during the construction phase will be maintained in a satisfactory condition and in accordance with manufacturer recommendations. In particular, exhaust silencers will be fitted and operating correctly at all times. Defective silencers will be immediately replaced.
- Queuing of HGVs on Ballymount Road Upper will be prohibited.
- Machinery not in active use will be shut down.
- A site representative will be appointed as a liaison officer with the local community.
- All complaints of noise received during the construction phase will be logged in a register, and investigated immediately. Details of follow-up action will be included in the register.
- Where it is proposed to import potentially noisy plant to the site, the potential impact of noise emissions will be assessed in advance.
- Guidance set out in BS 5228:2009 with respect to noise control will be applied throughout the construction phase.

5.2 Operational phase

All waste management operations will be confined internally within the proposed building. Access for HGVs will be provided by fast acting roller shutter doors which will be opened to allow HGV entry and exit. The doors will be closed during normal operations. This constitutes one of the two main noise mitigation measures.

The second measure, identified during the preliminary noise modelling stage, is the requirement for an acoustic barrier along the southeast boundary in order to attenuate noise emissions propagated towards the nearest dwelling. This is particularly relevant with respect to HGV movements during evening and night-time hours. The proposed barrier, extending to a height of 4 m, has been incorporated into the project design, and is shown in project drawings (see Figure 16). The barrier has been incorporated into predictive noise modelling described above. The barrier will be entirely solid without panel gaps, and will most likely be constructed using insulated cladding on a steel framework to provide a minimum of 10 dB transmission loss.

In addition to the foregoing, the applicant proposes to apply the following general measures:

- The proposed building will be constructed so as to avoid any gaps at cladding joints.
- Prior to selection of the air management system and odour control unit, noise emissions data will be assessed to ensure that emissions are entirely broadband in character.
- All mobile plant will be fitted with flat spectrum reversing alarms.
- Hooting will be prohibited onsite. Drivers of plant and vehicles will be instructed to avoiding hooting at all times.
- Plant used onsite will be maintained in a satisfactory condition and in accordance with manufacturer recommendations.
- A site representative will be appointed as a liaison officer with the local community.
- All complaints of noise received will be logged in a register, and investigated immediately. Details of follow-up action will be included in the register.

5.3 Monitoring

Given that baseline noise levels are elevated, construction phase noise monitoring is not warranted. Once operational, the facility will require an amended licence from the EPA. Any licence granted is likely to include noise limits and noise monitoring requirements. A monitoring programme will be commissioned by the operator in compliance with the licence conditions.

6 Residual impacts

6.1 Construction phase

At intervals during the construction phase, the loudest construction activity is likely to be audible at the nearest dwelling, outside the southeast boundary. During the 1-3 days when concrete breaking is undertaken, noise emissions are likely to be audible at this dwelling, as well as five other dwellings between the site and the roundabout to the southeast. Emissions will be inaudible at all other receptors. While audible at the nearest dwellings, construction noise will not exceed the 65 dB criterion, although concrete breaking will see a temporary increase to 69 dB at the nearest dwelling.

Construction phase noise emissions will be temporary. There will be extended periods when little or no emissions arise. On this basis, construction phase noise impacts are as follows:

Source	Onsite construction operations
Receptor	Dwelling outside SE corner
Quality	Negative
Significance	Imperceptible to not significant (slight to moderate during concrete breaking)
Duration	Temporary

Source	Onsite construction operations
Receptor	5 dwellings further SE, between site and roundabout to SE
Quality	Negative
Significance	Imperceptible (not significant to slight during concrete breaking)
Duration	Temporary

Source	Onsite construction operations
Receptor	Distant dwellings
Quality	Neutral
Significance	Imperceptible
Duration	Temporary

6.2 Operational phase

Noise levels will comply with EPA criteria at all offsite receptors. A BS 4142:2014 assessment indicates that no adverse impacts will arise. At all receptors, facility noise emissions will be masked by road traffic noise, thus minimising impacts. Operational phase noise impacts assessed with respect to the EPA scheme of significance are summarised as follows:

Source	Onsite operations (internal operations, air management system, HGVs)
Receptor	All dwellings
Quality	Neutral
Significance	Imperceptible
Duration	Permanent

Source	Site related traffic on public roads
Receptor	Dwelling outside SE corner
Quality	Negative
Significance	Imperceptible during daytime hours, not significant during night-time hours
Duration	Permanent

Source	Site related traffic on public roads
Receptor	All other dwellings
Quality	Neutral
Significance	Imperceptible
Duration	Permanent

Site operations will not generate groundborne vibration.

6.3 Population & human health

The assessment of impacts on human health is typically undertaken by reference to WHO guidance, which has been revised over the last four decades according as noise and health studies have been published. The WHO currently recommends the following:

- In residential settings, a daytime-evening $L_{Aeq\ 16\ h}$ level of 50 dB is an indicator of moderate annoyance.
- A night-time $L_{Aeq\ 8\ h}$ level of 45 dB is recommended to prevent sleep disturbance.

The proposed development will not result in any breach of the above criteria. On this basis, it is considered that there will be no adverse noise impact on the local population or on human health.

6.4 Cumulative impacts

Traffic noise levels across the local area, from nearby roads as well as the M50, are continuously elevated on a 24/7 basis, masking commercial and industrial noise emissions generated by surrounding facilities. This entirely minimises the potential for cumulative noise impacts arising from combined operations at the proposed development in tandem with operations at other premises. Most, if not all, of these premises, do not operate during evening or night-time hours, further minimising the possibility of cumulative impacts. It is therefore concluded than cumulative noise impacts will not arise.

6.5 Summary of effects

Once commissioned, noise impacts at surrounding receptors will be imperceptible. A BS 4142:2014 assessment indicates that no adverse impacts will arise. Noise levels will meet WHO criteria. No indirect impacts or interactive effects have been identified. There will be no adverse noise impacts on the local population or on human health. No cumulative impacts will arise

Glossary

Ambient: Total noise environment at a location, including all sounds present.

A-weighting: Weighting or adjustment applied to sound level to approximate non-linear frequency response of human ear. Denoted by suffix A in parameters such as $L_{Aeq\ T}$, $L_{AF10\ T}$, etc.

Background level: A-weighted sound pressure level of residual noise exceeded for 90 % of time interval T. Denoted $L_{AF90\ T}$.

Broadband: Noise which contains roughly equal energy across frequency spectrum. Does not contain tones, and is generally less annoying than tonal noise.

Decibel (dB): Unit of noise measurement scale. Based on logarithmic scale so cannot be simply added or subtracted. 3 dB difference is smallest change perceptible to human ear. 10 dB difference is perceived as doubling or halving of sound level. Examples of decibel levels are as follows: 20 dB: very

quiet room; 30-35 dB: night-time rural environment; 55-65 dB: conversation; 80 dB: busy pub; 100 dB: nightclub. Throughout this report noise levels are presented as decibels relative to 20 µPa.

Effect: Consequence of an impact.

Emissions: Noise originating from source under consideration, spreading spherically, hemispherically or otherwise into surrounding environment.

Fast response: 0.125 seconds response time of sound level meter to changing noise levels. Denoted by suffix F in parameters such as $L_{AF10\,T}$, $L_{AF90\,T}$, etc.

Frequency: Number of cycles per second of a sound or vibration wave. Low frequency noise may be perceived as hum, while whine represents higher frequency. Range of human hearing approaches 20-20,000 Hertz.

Hertz (Hz): Unit of frequency measurement.

Impact: Change resulting from an action, such as implementation of a project.

Impulse: Noise which is of short duration, typically less than one second, sound pressure level of which is significantly higher than background.

Interval: Time period T over which noise parameters are measured at position. Denoted by T in $L_{Aeq\,T}$, $L_{AF90\,T}$, etc.

$L_{Aeq\,T}$: Equivalent continuous sound pressure level during interval T, effectively representing average A-weighted noise level of ambient noise environment.

$L_{AF90\,T}$: Sound pressure level exceeded for 90% of interval T, usually used to quantify background noise. May also be used to describe noise level from continuous steady or almost-steady source, particularly where local noise environment fluctuates.

L_{AFmax}: Maximum A-weighted sound pressure level occurring during measurement interval.

L_{day}: The A-weighted long term average incident sound pressure level determined over all the daytime periods of a year, where the daytime period is typically 0700-1900 h.

L_{den}: Day-evening-night noise level. Calculated from separate L_{day}, $L_{evening}$ and L_{night} levels using formula specified in EU Directive 2002/49/EC.

$L_{evening}$: The A-weighted long term average incident sound pressure level determined over all the evening periods of a year, where the evening period is typically 1900-2300 h.

L_{night}: The A-weighted long term average incident sound pressure level determined over all the night-time periods of a year, where the night-time period is typically 2300-0700 h.

Noise sensitive location: Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires absence of noise at nuisance levels.

Octave band: Frequency spectrum may be divided into octave bands. Upper limit of each octave is twice lower limit.

Peak particle velocity (PPV): Rate of change of displacement of particles in solid medium due to vibration, measured as mm/s. Usually used to assess vibration in relation to activities such as blasting as correlates well with human perception of vibration and property damage.

Residual level: Noise level remaining when specific source is absent or does not contribute to ambient.

R_w: Overall sound reduction index provided across a range of frequencies, determined from laboratory measured sound insulating properties of material or building element in each frequency band.

Sound pressure: Deviation over ambient atmospheric pressure due to passing sound wave. Human ear is sound pressure detector, and thus acoustic parameters ultimately relate to sound pressure. Sound pressure level is ratio of measured sound pressure to reference value.

Soundscape: Acoustic environment as perceived, experienced or understood by listeners, taking context into account.

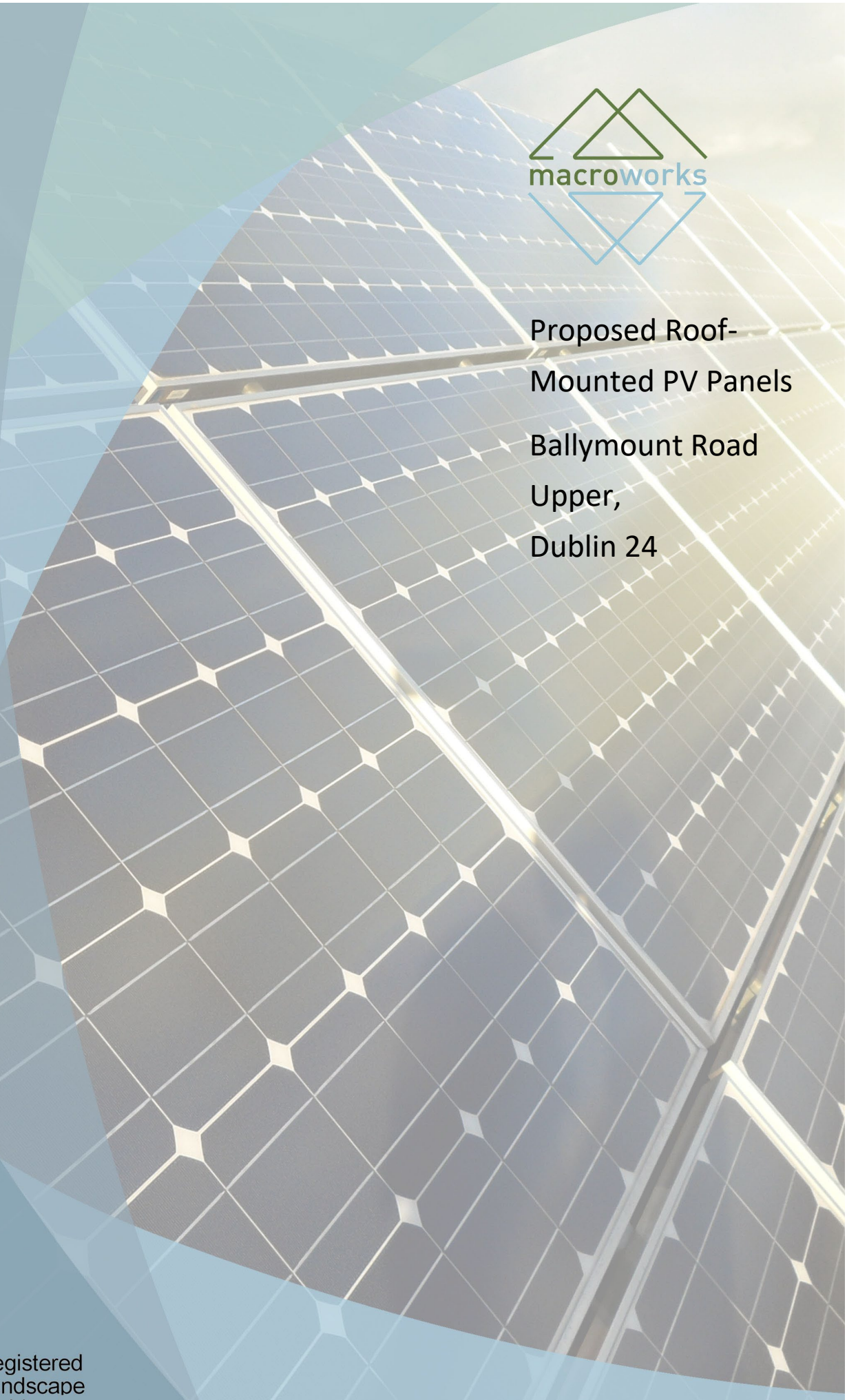
Specific level: $L_{Aeq\ T}$ level produced by specific noise source under consideration during interval T, measured directly or by estimation or calculation.

Tone: Character of noise caused by dominance of one or more frequencies which may result in increased noise nuisance.

APPENDIX 10.2

Glint & Glare Assessment

GLINT AND GLARE ASSESSMENT



macroworks

Proposed Roof-Mounted PV Panels

Ballymount Road Upper,
Dublin 24

Registered Landscape Architect

November 2023

1 INTRODUCTION

Macro Works Ltd. undertook a glint and glare assessment for a number of roof-mounted photovoltaic (PV) panels on the roof of the proposed warehouse at Ballymount Road Upper, Dublin 24 (Figure 1 refers).

Figure 1: Aerial view indicating the approximate location of the proposed PV panels (red pin).

2 STATEMENT OF AUTHORITY

Macro Works' relevant experience includes twenty years of analysing the visual effects of a wide range of infrastructural and commercial development types. This experience includes numerous domestic and international wind and solar energy developments. Macro Works has assessed the effects of glint and glare for many solar development sites throughout Ireland to date.

3 METHODOLOGY

The process for dealing with aviation receptors is as follows:

1. The Federal Aviation Administration (FAA) approved Solar Glare Hazard Analysis Tool (SGHAT) is used to determine if any of these aviation receptors has the potential to

theoretically experience glint or glare. This tool also calculates the intensity of such reflectance and whether it is acceptable by FAA standards.

2. SGHAT does not account for terrain screening or screening provided by surface elements such as existing vegetation or buildings, therefore the results of the SGHAT may need to be considered, in conjunction with an assessment of existing intervening screening that may be present, to establish if reflectance can actually be experienced at the receptors.
3. Finally, if necessary, additional assessment is undertaken using Macro Works' bespoke model which would into account any screening provided by any proposed mitigation measures.

4 GUIDANCE

Guidance has been prepared by the Federal Aviation Authority[1] to address the potential hazards that solar developments may pose to aviation activities, and this has been adopted for use by the Irish Aviation Authority. SGHAT was developed in conjunction with the FAA in harmony with this guidance and is commonly regarded as the accepted industry standard by aviation authorities internationally when considering the glint and glare effects upon aviation related receptors.

4.1 FEDERAL AVIATION AUTHORITY

Within the FAA's interim policy, a 'Review of Solar Energy System Projects on Federally Obligated Airports'[2] it states:

"To obtain FAA approval to revise an airport layout plan to depict a solar installation and/or a ''no objection'' to a Notice of Proposed Construction Form 7460–1, the airport sponsor will be required to demonstrate that the proposed solar energy system meets the following standards:

- *No potential for glint or glare in the existing or planned Airport Traffic Control Tower (ATCT) cab, and*
- *No potential for glare or ''low potential for after-image'' (shown in green in Figure 1* [Figure 2 refers]*) along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP). The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath."*

In summary, glare at an ATCT is not acceptable but glare with a *''low potential for after-image''* is acceptable along final approach paths to runways.

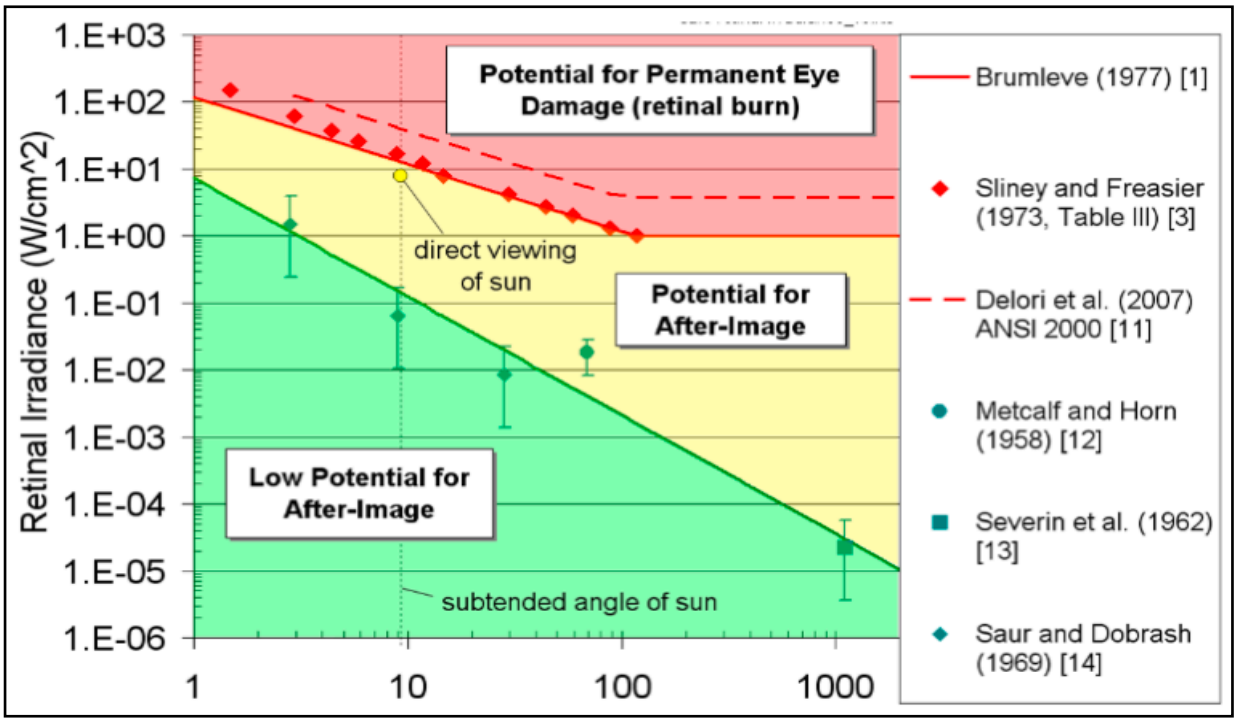
---

[1] Harris, Miller, Miller & Hanson Inc.. (November 2010). Technical Guidance for Evaluating Selected Solar Technologies on Airports; 3.1.2 Reflectivity. *Technical Guidance for Evaluating Selected Solar Technologies on Airports*. Available at: https://www.faa.gov/airports/environmental/policy_guidance/media/airport-solar-guide.pdf

[2] Federal Aviation Administration (FAA). (2013). Department of Transportation - Federal Aviation Administration. *Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports*. Vol 78 (No 205), 63276-63279.

4.2 SOLAR GLARE HAZARD ANALYSIS TOOL

The SGHAT was designed to determine whether a proposed solar energy project would result in the potential for ocular impact as depicted on the Solar Glare Hazard Analysis Plot (Figure 2 refers). SGHAT analyses ocular impact over the entire calendar year in one minute intervals from when the sun rises above the horizon until the sun sets below the horizon. One of the principal outputs from the SGHAT report is a glare plot per receptor that indicates the time of day and days per year that glare has the potential to occur. SGHAT plot classifies the intensity of ocular impact as either Green Glare, Yellow Glare or Red Glare. These colour classifications are equivalent to the FAA's definitions regarding the level of ocular impact e.g. 'Green Glare' in the SGHAT is synonymous to the FAA's *''low potential for after-image','* and so forth. The various correlations are illustrated on the Solar Glare Hazard Analysis Plot**.**



Solar Glare Ocular Hazard Plot: The potential ocular hazard from solar glare is a function of retinal irradiance and the subtended angle (size/distance) of the glare source. It should be noted that the ratio of spectrally weighted solar illuminance to solar irradiance at the earth's surface yields a conversion factor of ~100 lumens/W. Plot adapted from Ho et al., 2011.

Chart References: Ho, C.K., C.M. Ghanbari, and R.B. Diver, 2011, Methodology to Assess Potential Glint and Glare Hazards from Concentrating Solar Power Plants: Analytical Models and Experimental Validation, J. Solar Energy Engineering, August 2011, Vol. 133, 031021-1 – 031021-9.

Figure 2: Figure 1 from the FAA Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports

5 IDENTIFICATION OF RELEVANT RECEPTORS

5.1 HELICOPTER RECEPTORS

The proposed PV panels fall within the Tallaght University Hospital Solar Safeguarding Zone, relating to a helipad at Tallaght University Hospital. The helipad is situated approximately 2.8km to the southwest (heading 209 degrees) of the proposed PV panels (Figure 3 refers). There is no category for helipads within the FAA guidance and only recently have these been included as a standard aviation receptor in Ireland.

Figure 3: Aerial view (Google Earth Pro) showing the approximate location of the proposed panels (red pin) relative to the identified aviation receptor (yellow pin).

In the absence of specific flight path information for the helicopters that land at Tallaght University Hospital, and given the potential random trajectory of helicopter destination and arrival flights, it was deemed appropriate to analyse receptor points at multiple height intervals above the helipad. It is intended that these will serve for the evaluation of a wide variety of flight scenarios to and from the hospital.

The SGHAT software was utilised to undertake this analysis. Using the SGHAT software, Observation Points (OP) were placed at a representative selection of thirteen different heights (OP1 to OP13),

starting at 1.7m then increasing to 25m, thereafter increasing by 25m intervals above the helipad surface; 1.7m, 25m, 50m, 75m, 100m, 125m, 150m, 175m, 200m, 225m, 250m, 275m and 300m.

While the use of Observation Points for assessing a helipad are not included for in the FAA guidance, for the purpose of this assessment, it was assumed, as a worst-case scenario, that a similar hazard intensity classification would apply to helicopters at these Observation Points as would apply to passenger aircraft approaching a runway.

6 RESULTS

The SGHAT results for the Observation Points above the helipad at the Tallaght University Hospital are contained in Appendix A and show that none of the thirteen Observation Points have the theoretical potential to receive glare as a result of the proposed PV panels. **For this reason it is deemed highly unlikely for there to be any potential for hazardous impacts on helicopters in relation to the helipad in Tallaght Hospital.**

7 OVERALL CONCLUSION

From the analysis and discussions contained herein, it is considered that there will not be any hazardous glint and glare effects upon the identified aviation receptors - Tallaght University Hospital helicopter landing/take-off point - as a result of the proposed roof-mounted solar PV panels.

APPENDIX A:

SGHAT RESULTS

RUNWAYS APPROACHES, AIR TRAFFIC CONTROL TOWERS (ATCT) AND HELIPADS.

FORGESOLAR GLARE ANALYSIS

Project: **Tallagh Hospital - Helipad**
Site configuration: **SEHL**
Analysis conducted by Luis Dominguez (luis@macroworks.ie) at 09:34 on 31 Oct, 2023.

U.S. FAA 2013 Policy Adherence

The following table summarizes the policy adherence of the glare analysis based on the 2013 U.S. Federal Aviation Administration Interim Policy 78 FR 63276. This policy requires the following criteria be met for solar energy systems on airport property:

- No "yellow" glare (potential for after-image) for any flight path from threshold to 2 miles
- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics (see list below)

ForgeSolar does not represent or speak officially for the FAA and cannot approve or deny projects. Results are informational only.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	N/A	No flight paths analyzed
ATCT(s)	N/A	No ATCT receptors designated

Default glare analysis parameters and observer eye characteristics (for reference only):

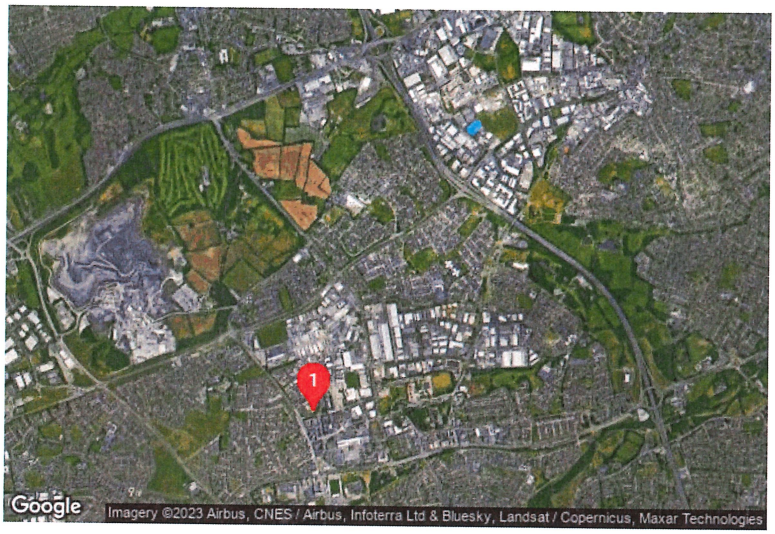
- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at https://www.federalregister.gov/d/2013-24729

SITE CONFIGURATION

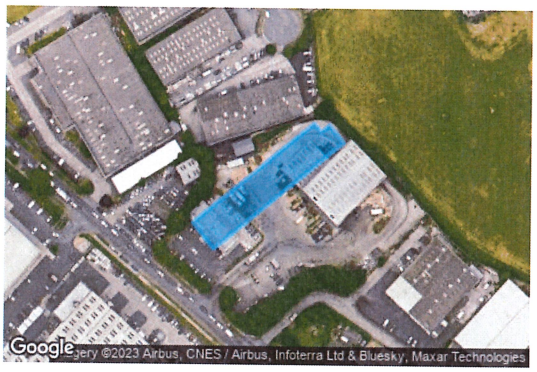
Analysis Parameters

DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 104301.9959
Methodology: V2



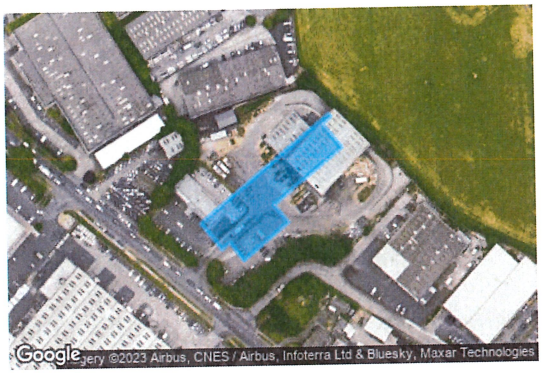
PV Array(s)

Name: PA_NW
Axis tracking: Fixed (no rotation)
Tilt: 6.0°
Orientation: 320.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312088	-6.356254	64.50	11.09	75.59
2	53.311948	-6.356063	64.50	13.22	77.72
3	53.312526	-6.354882	64.50	13.22	77.72
4	53.312619	-6.355009	64.50	11.80	76.30
5	53.312581	-6.355086	64.50	11.80	76.30
6	53.312628	-6.355149	64.50	11.09	75.59
7	53.312088	-6.356254	64.50	11.09	75.59

Name: PA_SE
Axis tracking: Fixed (no rotation)
Tilt: 10.0°
Orientation: 140.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.311938	-6.356049	64.50	13.22	77.72
2	53.311798	-6.355859	64.50	11.10	75.60
3	53.311834	-6.355786	64.50	11.10	75.60
4	53.311739	-6.355659	64.50	9.66	74.16
5	53.311938	-6.355251	64.50	9.64	74.14
6	53.312033	-6.355380	64.50	11.08	75.58
7	53.312338	-6.354755	64.50	11.05	75.55
8	53.312466	-6.354929	64.50	13.03	77.53
9	53.312504	-6.354852	64.50	13.04	77.54
10	53.312516	-6.354868	64.50	13.22	77.72
11	53.311938	-6.356049	64.50	13.22	77.72

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	53.289501	-6.376776	104.60	1.70
OP 2	2	53.289501	-6.376776	104.60	25.00
OP 3	3	53.289501	-6.376776	104.60	50.00
OP 4	4	53.289501	-6.376776	104.60	75.00
OP 5	5	53.289501	-6.376776	104.60	100.00
OP 6	6	53.289501	-6.376776	104.60	125.00
OP 7	7	53.289501	-6.376776	104.60	150.00
OP 8	8	53.289501	-6.376776	104.60	175.00
OP 9	9	53.289501	-6.376776	104.60	200.00
OP 10	10	53.289501	-6.376776	104.60	225.00
OP 11	11	53.289501	-6.376776	104.60	250.00
OP 12	12	53.289501	-6.376776	104.60	275.00
OP 13	13	53.289501	-6.376776	104.60	300.00

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt	Orient	"Green" Glare	"Yellow" Glare	Energy
	(°)	(°)	min	min	kWh
PA_NW	6.0	320.0	0	0	-
PA_SE	10.0	140.0	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0

Results for: PA_NW

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Results for: PA_SE

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

FORGESOLAR GLARE ANALYSIS

Project: **Tallagh Hospital - Helipad**
Site configuration: **SEHL**
Analysis conducted by Luis Dominguez (luis@macroworks.ie) at 09:34 on 31 Oct, 2023.

U.S. FAA 2013 Policy Adherence

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COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	N/A	No flight paths analyzed
ATCT(s)	N/A	No ATCT receptors designated

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
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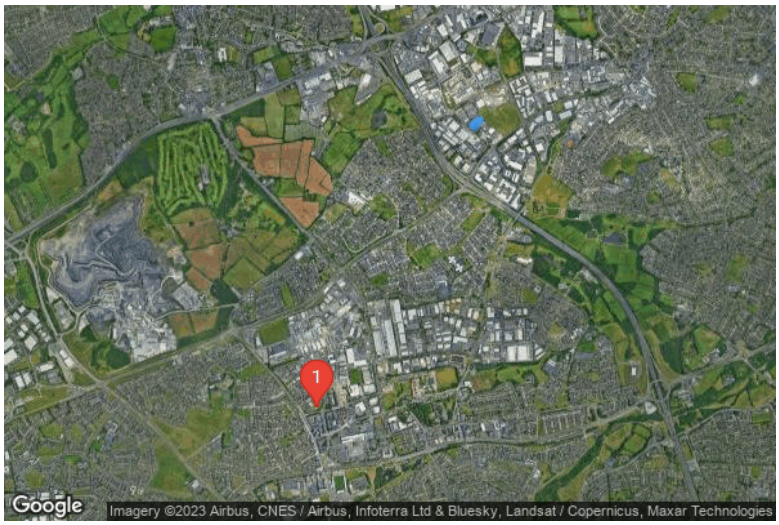
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at https://www.federalregister.gov/d/2013-24729

SITE CONFIGURATION

Analysis Parameters

DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 104301.9959
Methodology: V2



PV Array(s)

Name: PA_NW
Axis tracking: Fixed (no rotation)
Tilt: 6.0°
Orientation: 320.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
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6	53.312628	-6.355149	64.50	11.09	75.59
7	53.312088	-6.356254	64.50	11.09	75.59

Name: PA_SE
Axis tracking: Fixed (no rotation)
Tilt: 10.0°
Orientation: 140.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
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9	53.312504	-6.354852	64.50	13.04	77.54
10	53.312516	-6.354868	64.50	13.22	77.72
11	53.311938	-6.356049	64.50	13.22	77.72

Discrete Observation Receptors

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OP 5	5	53.289501	-6.376776	104.60	100.00
OP 6	6	53.289501	-6.376776	104.60	125.00
OP 7	7	53.289501	-6.376776	104.60	150.00
OP 8	8	53.289501	-6.376776	104.60	175.00
OP 9	9	53.289501	-6.376776	104.60	200.00
OP 10	10	53.289501	-6.376776	104.60	225.00
OP 11	11	53.289501	-6.376776	104.60	250.00
OP 12	12	53.289501	-6.376776	104.60	275.00
OP 13	13	53.289501	-6.376776	104.60	300.00

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PA_NW	6.0	320.0	0	0	-
PA_SE	10.0	140.0	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0

Results for: PA_NW

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Results for: PA_SE

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

APPENDIX 14.1

Transport Assessment

Refer to Transport Assessment provided seperately with application