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Metal Processors Ltd.

Station Road, Clondalkin, Dublin 22.

Environmental Impact Assessment Report for a Lead Manufacturing Facility

Volume 2: Main Body of the Environmental Impact Assessment Report

October 2019

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Table of Contents

1. INTRODUCTION 7

1.1 Introduction 7
1.2 Purpose of the EIA/EIAR 8
1.3 Scope of the EIA/EIAR 8
1.4 Screening, Scoping and Consultation 9
1.5 Consultants involved in the preparation of the EIAR 10
1.6 Difficulties in Compiling the EIAR 15
1.7 Layout of the EIAR 15
1.8 Assessment Criteria 16

2. PLANNING AND POLICY CONTEXT 19

2.1 Planning and Consents History 19
2.2 Planning and Policy Context/The Need for the Proposed Activity 21

3. EXAMINATION OF ALTERNATIVES 22

3.1 The 'Do Nothing' Scenario 22
3.2 Alternative Locations 22
3.3 Alternative Site Design/Layout 22
3.4 Alternative Processes 23
3.5 Alternative Mitigation Measures 23

4. DESCRIPTION OF THE PROPOSED ACTIVITY 24

4.1 General Overview of Facility Operations 24
4.2 Site Context 24
4.3 Site Infrastructure 27
4.4 Plant and Equipment 30
4.5 Construction Phase Activities 31
4.6 Operational Phase Activities 32
4.7 Proposed Dual Flow Drainage System 38
4.8 Site Management 39
4.9 Emission and Environmental Control and Mitigation Measures 51

5. POPULATION AND HUMAN HEALTH 55

5.1 Introduction 55
5.2 Assessment Methodology 55
5.3 Baseline Environment 56
5.4 Impact Assessment 59
5.5 Mitigation Measures 62
5.6 Residual Impacts 63

6. BIODIVERSITY 64

6.1 Introduction 64
6.2 Assessment Methodology 64
6.3 Baseline Environment 67
6.4 Impact Assessment 78
6.5 Mitigation Measures 80
6.6 Residual Impacts 81

7. LAND, SOILS & HYDROGEOLOGY 82

7.1 Introduction 82
7.2 Assessment Methodology 82
7.3 Baseline Environment 83
7.4 Impact Assessment 97

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EPA Export 14-11-2019:04:09:41

7.5 Residual Impacts 102

8. WATER 103

8.1 Introduction 103
8.2 Assessment Methodology 103
8.3 Baseline Environment 104
8.4 Impact Assessment 109
8.5 Construction Phase Impacts 109
8.6 Operational Phase Impacts 109
8.7 Mitigation Measures 114
8.8 Residual Impacts 115

9. AIR AND CLIMATE 117

9.1 Introduction 117
9.2 Assessment Methodology 117
9.3 Baseline Environment 118
9.4 Impact Assessment 126
9.5 Mitigation Measures 128
9.6 Residual Impacts 129

10. NOISE 131

10.1 Introduction 131
10.2 Assessment Methodology 131
10.3 Baseline Environment 134
10.4 Impact Assessment 138
10.5 Mitigation Measures 140
10.6 Residual Impacts 140

11. MATERIAL ASSETS 141

11.1 Introduction 141
11.2 Assessment Methodology 141
11.3 Baseline Environment 142
11.4 Impact Assessment 145
11.5 Mitigation Measures 147
11.6 Residual Impacts 148

12. CULTURAL HERITAGE 149

12.1 Introduction 149
12.2 Assessment Methodology 149
12.3 Baseline Environment 150
12.4 Impact Assessment 151
12.5 Mitigation Measures 152
12.6 Residual Impacts 152

13. LANDSCAPE 153

13.1 Introduction 153
13.2 Assessment Methodology 154
13.3 Baseline Environment 155
13.4 Impact Assessment 158
13.5 Mitigation Measures 164
13.6 Residual Impacts 164

14. INDIRECT IMPACTS, CUMULATIVE IMPACTS AND INTERACTIONS 165

14.1 Introduction 165
14.2 Methodology 165

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EPA Export 14-11-2019:04:09:41

14.3 Definitions 165
14.4 Indirect and Cumulative Impacts 166
14.5 Impact Interactions 166

Table of Tables

Table 1-1 Consultants involved in the preparation of the EIAR 11
Table 1-2 Descriptions of Effects 17
Table 2-1 Planning and Consents History 19
Table 4-1 Quantity of Waste Generated (2018) 44
Table 4-2 Quantity of Scrap Lead Accepted and Processed 2016 - 2018 46
Table 4-3 Resource Usage 2016 - 2018 46
Table 4-4 Hazardous Materials Stored On-site 47
Table 5-1 Population Trends 58
Table 5-2 Employment by Sector 59
Table 6-1 Criteria for Valuing Ecological Resources (Transport Infrastructure of Ireland) 66
Table 6-2 Designated Areas within 15 km of the site 68
Table 6-3 Record of Rare and Protected Fauna Species within 2 km Grid Unit 003R (National Biodiversity Data Centre) 76
Table 6-4 National Record of Rare and Protected Flora Species within 10 km Grid Unit 003 (National Biodiversity Data Centre) 77
Table 7-1 Summary of Window Sample Borehole Logs 87
Table 7-2 Groundwater Sources within 2 km of the site 94
Table 7-3 Estimation of Importance of Sensitive Attributes 97
Table 7-4 Estimation of the Magnitude of a Potential Impact on an Attribute 98
Table 7-5 Estimation of the Significance of Potential Impact 98
Table 7-6 Potential Impacts 99
Table 7-7 Mitigation Measures 100
Table 8-1 Summary of Past Biological Monitoring on the River Camac (Camac 040) 105
Table 8-2 Gallanstown Stream Surface Water Monitoring Results 106
Table 8-3 Past Stormwater Monitoring Results 2016 - 2018 107
Table 8-4 Stormwater Monitoring Results for Lead 2014 – 2019 108
Table 8-5 Comparison of Past Stormwater Monitoring Results with Relevant BAT Emission Limits 111
Table 8-6 Stormwater monitoring Results for Other Parameters of Interest. 111
Table 9-1 National Air Quality Standards for Particulates (as PM_{10}) and Lead 117
Table 9-2 BAT-associated emission levels for dust and lead emissions to air (other than those that are routed to the sulphuric acid or liquid SO2 plant) from charging, smelting and tapping in primary and secondary lead and/or tin production 118
Table 9-3 BAT-associated emission levels for dust and lead emissions to air from remelting, refining and casting in primary and secondary lead and/or tin production 118
Table 9-4 30 year averages for meteorological data from Met Eireann's Casement Aerodrome Weather Station 119
Table 9-5 Baseline Ambient Air Quality Data 2017 121
Table 9-6 Past Process Emission Monitoring Results at Emission Point AE-1 122
Table 9-7 Dust Monitoring Results 124
Table 9-8 Historic lead and dust results Vs new BAT ELV 127
Table 10-1 Noise Terminology 133
Table 10-2 Additional Baseline Monitoring at NSL6 & NSL7 137
Table 10-3 Summary of BS4142: 2014 Assessment 139
Table 11-1 Quantity of Scrap Lead Accepted and Processed 2016 - 2018 144
Table 11-2 Resource Usage 2016 - 2018 144
Table 14-1 Impact Interactions 167

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EPA Export 14-11-2019:04:09:41

Table of Figures

FIGURE 4-1 SITE LOCATION AND SURROUNDING LAND USES 26
FIGURE 4-2 OVERVIEW OF REFINING PROCESS 35
FIGURE 4-3 OVERVIEW OF THE MILLING PROCESS 36
FIGURE 4-4 OVERVIEW OF HOW IMPORTED SCRAP LEAD IS MANAGED 41
FIGURE 4-5 OVERVIEW OF HOW MIXED METALS WASTE IS MANAGED 42
FIGURE 4-6 OVERVIEW OF HOW DROSSES ARE MANAGED 42
FIGURE 4-7 OVERVIEW OF HOW NON-HAZARDOUS WASTE IS MANAGED 43
FIGURE 4-8 OVERVIEW OF HOW OTHER HAZARDOUS WASTES ARE MANAGED 43
FIGURE 6-1 SACS WITHIN 15 KM OF THE SITE 69
FIGURE 6-2 SPAS WITHIN 15 KM OF THE SITE 70
FIGURE 6-3 PNHAS WITHIN 15 KM OF THE SITE 71
FIGURE 6-4 SITE AND LOCAL AREA HABITAT MAP 72
FIGURE 7-1 TOPSOILS 84
FIGURE 7-2 SUBSOILS 85
FIGURE 7-3 BEDROCK GEOLOGY 85
FIGURE 7-4 SITE INVESTIGATION LOCATIONS 89
FIGURE 7-5 CROSS SECTION A_A' 90
FIGURE 7-6 DESIGNATED SITES 91
FIGURE 7-7 GROUNDWATER VULNERABILITY 93
FIGURE 7-8 GROUNDWATER FLOW DIRECTION 96
FIGURE 9-1 WINDROSE FOR CASEMENT AERODROME 1981 – 2010 119
FIGURE 9-2 DUST MONITORING LOCATIONS 123
FIGURE 10-1 NOISE SENSITIVE LOCATIONS 135
FIGURE 10-2 NOISE LIMITS PRESCRIBED IN EXISTING LICENCE 136
FIGURE 13-1 AERIAL PHOTO SHOWING SENSITIVE VISUAL RECEPTORS SURROUNDING THE SITE 157
FIGURE 13-2 VIEW FROM NINTH LOCK BRIDGE TOWARDS THE DIRECTION OF THE SITE 159
FIGURE 13-3 VIEW FROM GRAND CANAL TOWARDS THE SITE 159
FIGURE 13-4 VIEW FROM BALLYMANAGGIN LANE TOWARDS THE SITE 161
FIGURE 13-5 VIEW FROM STATION ROAD TOWARDS THE SITE 161
FIGURE 13-6 VIEW FROM RAHEEN RESIDENCES TOWARDS THE SITE 162
FIGURE 13-7 VIEW OF DUBLIN TO CORK RAILWAY LINE LOOKING ONTO THE SITE 163
FIGURE 13-8 VIEW FROM STATION ROAD BRIDGE ONTO THE SITE 163

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1. Introduction

1.1 Introduction

Metal Processors Ltd are a subsidiary of the Calder Group and are involved in the manufacture of lead and the distribution of roofing materials and ancillary roofing products. The company employs 25 people and occupies an industrial site at Station Road, Clondalkin, Dublin 22. The facility lies within Clondalkin Industrial Estate.

Metal Processors (hereafter referred to as 'the applicant') hold an existing Industrial Emissions Licence (Licence Reference: P0401-01) administered and enforced by the Environmental Protection Agency (EPA). The licensable activity occurring at their facility, in accordance with the EPA Act, as amended, is as follows:

3.4.1(b) The melting, including the alloyage, of non-ferrous metals, including recovered products and operation of non-ferrous metal foundries, with a melting capacity exceeding 4 tonnes per day for lead and cadmium or 20 tonnes per day for all other metals.

The Applicant intends to initiate a Review of their existing Industrial Emissions Licence in accordance with the EPA Act, as amended, for the purposes of:

1. Revising the Licence to ensure conformance with the Industrial Emissions Directive (2010/75/EU), namely to ensure compliance with new Best Available Techniques Conclusions (BAT-C) for preventing or minimising emissions and impacts on the environment for the non-ferrous metal industry (Commission Implementing Decision (EU) 2016/1032) and;
2. Regularizing and accommodating a proposed site modification involving the development of a Dual Flow Drainage System. This will involve the redirection of First Flush stormwater run-off from yard/roof areas, occasionally containing elevated concentrations of lead, to public foul sewer. This will create a new emission point, thereby causing a material change in the nature of emission emanating from the site.

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It is therefore Metal Processors' intention to submit an Industrial Emission Licence Review Application to the EPA for their review considering the above changes. No changes to processing activities, plant or production capacity on-site are proposed.

It has been determined that the proposal will need to be subject to an EIA as the Lead Manufacturing activity on-site constitutes a class of activity which requires EIA under the Environmental Impact Assessment (EIA) Directive (Directive 2011/92/eu amended by 2014/52/eu) and transposing legislation. As such, the applicant is required to submit an Environmental Impact Assessment Report (EIAR), along with its Industrial Emissions Licence Review Application, for the EPA to review as Competent Authority. Environmental Efficiency Consultants have been commissioned to coordinate the completion of the EIAR. This document contains the Main Body of the EIAR developed for the proposal.

A Planning Application for the development of the Dual Flow Drainage System (also known as 'Water Retention Tank and Balancing System) has been made separately by Malone Engineering acting as an agent for Metal Processors.

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Note for the Planning Authority

This EIAR, which is intended for the purposes of an Industrial Emission Licence Review Application, will also be submitted as part of the Planning Application. The Planning Authority is asked to refer in particular to Chapter 8 of this EIAR which deals with the impact of the dual flow drainage system proposal on the water environment.

1.2 Purpose of the EIA/EIAR

The purpose of the Environmental Impact Assessment (EIA) process is to identify and describe the likely, significant impacts of the project on the environment. The main purpose of an Environmental Impact Assessment Report (EIAR) is to present the assessment of the likely, significant impacts in written form.

This EIAR has been prepared in order to facilitate the identification, characterization and assessment of potential environmental impacts associated with the proposed activities at the applicant's industrial facility situated at Station Road, Clondalkin, Dublin 22. Where it is determined that the proposed activities are likely to have significant, adverse effects on the environment, mitigation measures have been developed to prevent, minimize and control such effects.

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1.3 Scope of the EIA/EIAR

This EIAR serves to assess the potential environmental impacts associated with existing manufacturing and ancillary activities and the development of the Dual Flow Drainage System at Metal Processors industrial facility situated at Station Road, Clondalkin, Dublin 22.

The primary activity carried out by the applicant at their facility is the production of sheet and block lead. Secondary activities such as metalworking activities and product distribution activities also occur on-site. It is proposed to continue these activities on-site, ensuring that they are undertaken in a manner that conforms to the revised Best Available Techniques Conclusions (BAT-C) for the non-ferrous metal industry and any other applicable environmental standards or guidelines. The existing Industrial Emissions licence is being reviewed for the purpose of updating the licence to ensure conformance with these BAT Conclusions.

In addition, as discussed, it is proposed to develop a Dual Flow Drainage System on-site and re-direct First Flush stormwater run-off from yard/roof areas, which can contain elevated concentrations of lead, to public foul sewer, creating a new emission point on-site.

From this point onwards in the document the above site activities and proposed site drainage modification will be referred to as the 'Proposed Activity.'

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1.4 Screening, Scoping and Consultation

The start of the EIA process involves deciding whether an EIA needs to be undertaken or not. This stage is known as the EIA Screening Stage. Through consultation with the EPA, it has been determined that the proposed activity will need to be subject to an EIA as it constitutes a class of activity which requires EIA under the EIA Directive.

Following the Screening Stage, a Scoping Assessment is carried out in order to identify likely, significant impacts associated with the proposed activity and to 'scope out' environmental topics that do not need to be addressed within the EIAR. This stage is known as the Scoping Stage. The Scoping Assessment Methodology for the EIAR involved the following steps:

1. The applicant engaged with the Competent Authority, the Environmental Protection Agency, during the Scoping Phase of the EIA in order to comprehensively identify important environmental topics and potential environmental impacts that must be addressed during the EIA process.

2. A Review of relevant Environmental Legislation, the Environmental Policy Context and relevant Environmental Standards and Guidelines, took place to determine requirements from an environmental perspective that apply to the industrial activity in question.

3. A review of Best Available Techniques Conclusions (BAT-C) for the non-ferrous metal industry for preventing or minimising emissions and impacts on the environment. (Commission Implementing Decision (EU) 2016/1032) took place in order to ascertain Environmental Standards pertaining to the industrial activity in question.

4. Planning Application Files and EIAR's for similar projects in the local area and wider region were examined to identify important environmental issues and potential environmental impacts that may be relevant or that may arise as a result of the nature, location and/or characteristics of the proposed activity.

5. A Scoping Exercise was undertaken. The proposed activity and the receiving environment were assessed and characterized in order to identify project elements and processes, baseline environmental sensitivities, key emissions or threats, likely and potential environmental pathways, interactions between the proposed activity and the receiving environment and likely, potential effects on significant or sensitive environmental factors or assets. Methods for addressing potential environmental impacts in the EIAR were then identified.

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Regard was had to the following guidance documents in completing the scoping exercise:

- EPA Guidelines on Information to be contained in EIAR's (2017) (Draft)
- EPA Advice Notes for preparing Environmental Impact Statements (2015)
- European Commission Guidance on EIA Scoping, June 2001.

A Scoping Report detailing the output from the Scoping Assessment undertaken by Environmental Efficiency Consultants was then developed. (See Volume 4 of the EIAR, '*EIAR Volume 4: Scoping Report*').

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1.5 Consultants involved in the preparation of the EIAR

Environmental Efficiency Consultants have been commissioned by the applicant to complete the Industrial Emissions Licence Review Application Form and coordinate and complete the adjoining Environmental Impact Assessment Report. Third party consultants have been procured where additional knowledge and expertise in relation to certain environmental areas is required. Table 1-1 below details the consultants involved in the preparation of the EIAR, their qualifications, competencies and the EIAR tasks they carried out.

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Table 1-1 Consultants involved in the preparation of the EIAR

Company	Name and Title	Relevant Qualifications	Competency/Experience	EIAR Tasks
Environmental Efficiency Consultants	Bob Sutcliffe, Managing Director and Chartered Engineer	CEng, MIMechE, MIEI, CMIWM	Bob is a Chartered Engineer since 1980, a Member of the Institution of Mechanical Engineers, a Certified Energy Manager under the UK and Irish registers, and also a member of Engineers Ireland. Bob formed Environmental Efficiency Consultants as a broad focus environmental consultancy in 1996. As such, Bob has a vast amount of experience in Environmental Consultancy. In particular, Bob has extensive experience and in-depth knowledge and expertise when it comes to overseeing the completion of EPA Licence Applications and EIS's/EIAR's for industries and sectors.	Overview and project sign off.
	Richard Deeney, Senior Planning and Environmental Consultant.	B.Sc. Environmental Management, PIEMA, Adv. Dip. Planning and Environmental Law.	Richard is a Senior Environmental/Planning Consultant with Environmental Efficiency Consultants who holds a B.Sc. in Environmental Management, as well as an Advanced Diploma in Planning and Environmental Law with the Kings Inns. He has been with the company for seven years at the time of writing. In this role Richard has provided technical advice and services to clients in the areas of broad base Environmental Consultancy, Industrial Emission Licensing, EIA and Planning, among other areas. Richard has extensive experience scoping, planning, coordinating and executing EIS's/EIAR's for various types of industry,	Coordination and completion of the EIAR. Review of Planning and Policy Context. Examination of Alternatives. Evaluation of the Proposed Activity. Completion of the 'Population and Human Health' chapter. Completion of the 'Biodiversity' chapter. Completion of the 'Water' chapter. Completion of the 'Material Assets' chapter. Completion of the 'Cultural Heritage' chapter. Completion of the 'Landscape' chapter.

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Company	Name and Title	Relevant Qualifications	Competency/Experience	EIAR Tasks
			including metal processing facilities, waste facilities, quarries and wind farm development. Richard has a wide and in-depth knowledge of a broad range of environmental topics as well as a robust understanding of EIA requirements and legislation. Richard has extensive experience successfully completing EIAR Chapters for a broad range of environmental topics and for various types of development.	Completion of the 'Indirect Impacts, Cumulative Impacts and Interactions' chapter.
	George Byrne, Senior Environmental Consultant and Air Quality Specialists.	M.Sc. Biosystems Engineering, Cert in AERMOD/CALPUFF	George is Senior Consultant with Environmental Efficiency Consultants with academic qualifications as a Bachelor of Agricultural Science and a Master of Science in Biosystems Engineering. Serving as a senior environmental consultant in Environmental Efficiency's 'monitoring and analysis' group, George's responsibilities cover the monitoring of all environmental emissions (noise, water, air) plus occupational noise and indoor air quality. George is also a Certified AERMOD and CALPUFF dispersion modeller responsible for Environmental Efficiency's air dispersion modelling work and has extensive experience in this regard. In addition to this George has extensive experience in scoping, planning and executing Air and Climate chapters of EIS's/EIAR's for various types of project.	Completion of the 'Air and Climate' chapter.
	Ronan Sutcliffe, Senior Environmental	Dip. Environmental Protection, Environmental	Ronan is a Senior Environmental Consultant who has focused on environmental and health and safety monitoring auditing for over 16	Completion of the 'Noise' Chapter

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Company	Name and Title	Relevant Qualifications	Competency/Experience	EIAR Tasks
	Consultant and Noise Specialist.	Noise Certificate Institute of Acoustics	consecutive years (2002-2018). Ronan specializes in Environmental and Occupational noise monitoring as well as Noise Prediction modelling. Ronan has extensive experience conducting Noise Prediction Modelling and Noise Impact Assessment for the purposes of EIA.	
Bluerock Environmental	Niall Mitchell, Hydrogeologist & Chartered Engineer.	BE, MSc, CEng MIEI, PGeo	Niall is a Professional Hydrogeologist and Chartered Engineer with over 20 years' experience in the area of hydrogeological investigations and assessments, contaminated land investigations, risk assessment and remediation design and validation. He has an honours Civil Engineering degree from NUI Galway, a Master's degree in Environmental Engineering from Trinity College and a Master's degree in Applied Hydrogeology from Newcastle University. Niall has been involved with high profile projects across the island of Ireland providing hydrogeological and contamination expertise for Environmental Impact Assessments, brownfield/fuel spill/chemical spill site investigations, risk assessments and remediation design. Example projects have included the Corrib Gas Terminal Site, (Co. Mayo), Titanic Quarter Redevelopment (Belfast), Barrow Street Gasholder Site (Dublin), Poolbeg Incinerator Project (Dublin) and Haulbowline Naval Base (Co. Cork).	Completion of the 'Land and Soils chapter, (inclusive of Hydrogeology).
	Padraig Kelly	BSc, MSc	Padraig is a project Hydrogeologist who has an honours degree in Environmental Science from	Completion of the 'Land and Soils chapter, (inclusive of Hydrogeology).

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Company	Name and Title	Relevant Qualifications	Competency/Experience	EIAR Tasks
			NUI Galway and a Master's degree in Hydrogeology from University of Strathclyde, Glasgow.	

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1.6 Difficulties in Compiling the EIAR

No significant difficulties were encountered during the carrying out of any impact assessment or during the production of the EIAR.

1.7 Layout of the EIAR

The EIAR comprises four Volumes consisting of the following:

- Volume 1: EIAR Non-technical summary
- Volume 2: EIAR Main Body
- Volume 3: EIAR Appendices
- Volume 4: EIAR Scoping Report

The Non-technical summary of the EIAR presents a synopsis of the main body of the EIAR and includes an outline of the proposed activity and an outline, in clear, understandable and succinct language, of the direct and indirect environmental effects of the proposed activity.

The main body of the EIAR provides detailed, comprehensive information on the background to the proposal, the need, purpose and scope of the EIAR, the characteristics of the proposed activity and potential, direct, indirect and cumulative environmental effects of the proposed activity.

Having regard to the Scoping Assessment undertaken and the EPA Guidelines on Information to be contained in EIAR's (2017) (Draft), it was decided to format the main body of the EIAR in the following manner:

1. Preamble
2. Planning and Policy Context
3. Examination of Alternatives
4. Description of the Proposed Activity
5. Population and Human Health
6. Biodiversity
7. Land and Soils
8. Water
9. Air and Climate
10. Noise
11. Material Assets
12. Cultural Heritage
13. Landscape
14. Indirect Impacts, Cumulative Impacts and Interactions

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Sections 5 to 14 of the main body of the EIAR comprise the Environmental Topic Chapters. These chapters have been layed out in the following manner:

- Introduction
- Assessment Methodology
- Baseline Environment
- Impact Assessment
- Mitigation Measures
- Residual Impacts

Certain environmental topics have been 'scoped out' of the EIAR due to the nature and characteristics of the proposed activity. Where an environmental topic pertaining to a prescribed environmental factor has been scoped out of the EIAR, an explanation of the reasons for scoping out such environmental topics are provided in the relevant chapter.

An EIAR Appendices was developed in order to collate all supporting and supplementary information. This Appendices is cross referenced throughout the main body of the EIAR as appropriate.

The EIAR Scoping Report provides a synopsis of the EIA Scoping Assessment undertaken. This was undertaken for the purpose of identifying significant environmental effects which are likely to occur as a result of the proposed activity and scoping out environmental topics which are not deemed to be relevant considering the nature and characteristics of the proposed activity, the characteristics of the existing environment and sensitive receptors, and the overall significance of said environmental topics.

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1.8 Assessment Criteria

Impact Assessment Criteria have been established in order to accurately assess and characterize the environmental impacts of the proposed activity. The following criteria have been considered when describing environmental effects:

- Magnitude and spatial extent of the effects
- Nature of the effects
- Transboundary nature of the effects
- Intensity and complexity of the effects
- Probability of the effects
- Expected onset, duration, frequency and reversibility of the effects
- Cumulation of the effects with the effects of other existing and/or approved projects
- Possibility of effectively reducing the effects.

Detailed criteria for describing effects is shown in the table below. This criteria has been established by the EPA and is detailed in their Guidance Document *Guidelines on the Information to be contained in Environmental Impact Assessment Report.*

Where alternative criteria is used to assess and characterize environmental impacts relating to a particular environmental topic this criteria is detailed in the relevant environmental topic chapter.

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Table 1-2 Descriptions of Effects

Quality of Effects	**Positive Effects** A change which improves the quality of the environment
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse Effects A change which reduces the quality of the environment
Describing the Significance of Effects	**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.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects 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 Effects An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects	**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
Describing the Probability of Effects	**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.
Describing the Duration and Frequency of Effects	**Momentary Effects** Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day

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	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Describing the Types of Effects	**Indirect Effects (a.k.a. Secondary Effects)** 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 Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do-Nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	`Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents

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2. Planning and Policy Context

2.1 Planning and Consents History

2.1.1 Planning Permissions for the Subject Site

The applicant's Manufacturing Facility based on Station Road, Clondalkin, Dublin 22 has been in existence since before 1963. As the facility pre-dates the introduction of the Planning and Development Act of 1963 activities on-site are exempted from the need to obtain planning permission.

A number of changes have occurred on-site since 1963. As such, a number of planning permissions pertaining to the site have been obtained by the applicant since the introduction of the Planning and Development Act. The table below provides a list of all Planning Permissions obtained by the applicant at the site.

Table 2-1 Planning and Consents History

Planning Reference	Description of the Development	Decision grant Date
PP 2079	Extensions and alterations to Factory Premises	20/04/1966
PP 3990	Construction of an additional building on-site	15/12/1967
PP 4161	Proposed Extension of Factory Development	06/11/1967
PP WA1146	Variations to storage building	16/09/1981
PP SD07A0487	A single storey warehouse to the rear approx. 534 sqm in area for the storage of sheet metal, and a two storey area to the front of approx., 260 sqm in area providing a staff recreation area, meeting room and welfare facilities and associated car parking	09/10/2007

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2.1.2 Industrial Emissions Licence

The Lead Manufacturing activity on-site falls under the scope of the EPA Act, as amended. As such, in accordance with the EPA Act of 1992, the applicant applied for an Integrated Pollution Control licence on 09/03/1998. They were granted an IPC licence (Licence Ref. P0401-01) on 20/08/1998.

The licence was amended in 2005 to bring it into conformity with the provisions and requirements of the Integrated Prevention Pollution Control Directive (Council Directive 96/61/EC) by the exercise of the powers conferred by Section 82 (1 1) of the Environmental Protection Agency Acts 1992 and 2003.

The licence was updated to an Industrial Emissions Licence in 2013 and amended to bring it into conformity with the provisions and requirements of the Industrial Emissions Directive (Council Directive 2010/75/EU) by the exercise of the powers conferred by Section 82A (11) of the Environmental Protection Agency Acts 1992 and 2003.

2.1.3 Recent Planning Applications/Permission in the Local Area

A number of greenfield and brownfield sites situated in the local and wider area have been zoned Objective RES - *To protect and/or improve residential amenity,* under the South Dublin County Council Development Plan. These locations and their potential for future housing should be given appropriate consideration throughout the EIAR.

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Planning Permission (Ref SD17A/0171) was granted for 22 apartments at a site approximately 170 metres north of the site boundary on Cloverhill Road, Raheen, Dublin 22. This apartment complex has been recently constructed.

Planning Permission (Ref: SD17A/0397) has been granted for 85 dwellings comprising 65 houses and 20 apartments at a site approximately 65 metres north west of the site boundary on Cloverhill Road, Raheen, Dublin 22. At the time of writing construction has not commenced on-site however it is anticipated construction will commence on-site in the near future.

A Planning Application (Ref: SD188/0006) has been submitted for a Social Housing Development consisting of 44 units on New Nangor road approximately 400 metres south east of the site. This application has been approved by the council.

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2.2 Planning and Policy Context/The Need for the Proposed Activity

An assessment of the proposed activity in the context of national and regional plans and policy was undertaken to demonstrate how the proposed activity conforms to relevant planning and policy objectives.

The applicant's Manufacturing Activity contributes to achieving waste policy objectives detailed in the following national and regional waste policy documents:

- The national policy document *A Resource Opportunity: Waste Management Policy in Ireland,* published in 2012 by the Department of the Environment, Community and Local Government.
- *Eastern-Midlands Regional Waste Management* Plan (WMP) 2015-2021

Irish Waste Management policy, as defined in the above documents, is predicated on the EU Waste Hierarchy of prevention, preparing for re-use, recycling, energy recovery and sustainable disposal. The acceptance, refining and recovery/recycling of scrap lead at the applicant's facility contributes towards promoting waste recycling and resource efficiency, and achieving a circular economy, in accordance with European, national and regional waste management policy objectives defined in the above policy documents and EU legislation such as the Waste Framework Directive (Council Directive 2008/98/EC).

The proposed activity is also consistent with policy objectives set out in the South Dublin County Council Development Plan 2016 -2022. Policies and objectives in relation to waste management in South Dublin are reflective of overarching EU, National and Regional policy and legislation. The recovery and recycling of lead at the facility is in line with South Dublin County Council's policy to 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.

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In addition to the above, considering the planning context of the local area, the subject site in Clondalkin is deemed to be a suitable location for the Proposed Activity given that; the facility is a long-standing facility, the site is situated in a well-established industrial estate, the site is immediately surrounded by other commercial, industrial and waste facilities, and there are no sensitive receptors in close proximity to the site.

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3. Examination of Alternatives

3.1 The 'Do Nothing' Scenario

The retention of the existing stormwater drainage system on-site was considered. Ultimately, the applicant decided on developing a new Dual Flow Drainage System on-site in order to prevent the discharge of stormwater containing elevated levels of lead to the environment.

Currently, stormwater generated at non-process, roof and yard areas on-site is being directed to the public stormwater sewer before being discharged to the Gallanstown Stream. Past monitoring results indicate that, occasionally, lead concentrations in stormwater run-off arising on-site can be elevated relative to the lead Environmental Quality Standard for the surface water. As such, existing stormwater discharges from the site may be having an adverse impact upon the water quality and aquatic ecology of the receiving stream. A 'Do Nothing' scenario would result in the facility continuing to direct elevated levels of lead in stormwater to receiving surface waters.

Considering the above, the Applicant has decided to reconfigure the drainage system on-site to ensure better environmental protection. A site modification involving the development of a Dual Flow Drainage system and the redirection of First Flush stormwater generated on-site to public foul sewer is proposed. This Dual Flow Drainage proposal is discussed in further detail in Section 4.7.

In addition, it is noted that the industrial Emission Licence for the facility must be revised in order to align with latest Bat Conclusions for the non-ferrous metal industry. A 'Do Nothing' scenario would also result in activities on-site not being regularized and controlled in accordance with the Industrial Emissions Directive and BAT-C for the non-ferrous metal industry.

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3.2 Alternative Locations

The applicant's facility at Station Road, Clondalkin, Dublin 22 is a long-established manufacturing facility. It is situated within a well-established industrial estate and is deemed to be suitable for its existing location considering the history of land use on-site and in the surrounding area, the industrial character of the surrounding area generally and the buildings, services and utilities provided on-site.

At the current time it is not economically or logistically practicable to re-locate the site. Therefore, no other site locations were considered for the proposed activity.

3.3 Alternative Site Design/Layout

The design and layout of the site is deemed to be appropriate having regard to production and processing operations taking place at the facility, the location of buildings and processes on-site, the proximity of surrounding sensitive land uses, and the potential for off-site environmental impacts.

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3.4 Alternative Processes

An evaluation of existing production and processing operations was undertaken by the applicant to ensure conformance with Best Available Techniques Conclusions (BAT-C). This assessment determined that facility operations comply with BAT Requirements prescribed in the BAT-C for the non-ferrous metal industry (Commission Implementing Decision (EU) 2016/1032). As such, the applicant is not required to make any alterations to processes taking place on-site to ensure conformity with the BAT Conclusions. In addition, under the Industrial Emissions Licence Review, the applicant does not propose on carrying out any new production or processing operations or altering any existing production or processing operations on-site. As such, the use of alternative processes at the facility has not been considered.

3.5 Alternative Mitigation Measures

Consideration was given to developing a drainage system which would direct all stormwater generated on-site to foul sewer and away from receiving surface waters. This option was not considered feasible however as it would have involved the construction of an excessively large stormwater retention tank on-site in order to meet Irish Water flow limits to sewer. It was determined that there was insufficient space on-site for a tank of the required size.

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4. Description of the Proposed Activity

4.1 General Overview of Facility Operations

The primary activity carried out by the applicant at their facility situated at Station Road, Clondalkin, Dublin 22 is the production of sheet and block lead. Scrap lead is accepted by the applicant on-site before being melted and refined to 99.95% purity in accordance with the European Standard EN12588 *Lead and lead alloys - Rolled lead sheet for building purposes*. Refined lead is then cast into mouldings to produce lead blocks, which are either milled on-site to produce rolled lead sheet which is then sold to the construction industry, or dispatched directly to a sister facility abroad owned by The Calder Group for further processing.

In addition to the main lead production activity, the applicant is also involved in the distribution of roofing materials and ancillary roofing products, and on-site metalworking activities.

The facility has a maximum non-ferrous metal melting capacity of 219 tonnes per day having regard to the number of Melting Kettles used for initial smelting present on-site and their physical/technical capacity. The licensable activity therefore, under the EPA Act, as amended, is as follows:

3.4.1(b) The melting, including the alloyage, of non-ferrous metals, including recovered products and operation of non-ferrous metal foundries, with a melting capacity exceeding 4 tonnes per day for lead and cadmium or 20 tonnes per day for all other metals.

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4.2 Site Context

The applicant occupies a site situated at Station Road, Clondalkin, Dublin 22. It is situated in Clondalkin Industrial Estate and is immediately surrounded by commercial and industrial facilities in all cardinal directions. The site itself comprises of a number of industrial and administrative buildings surrounded by large areas of yard. It is bordered to the north by the Dublin to Cork Railway Line. Ronanstown lies to the north of the site and Clondalkin lies to the south and west. The M50 motorway runs to the east of the site.

The nearest residential dwellings are houses situated in James Connolly Park housing estate which is approximately 100 m to the south-west of the site. In addition, residential dwellings are located on Station Road to the south west of the site, Ballymanaggin Lane to the south of the site and in Raheen to the north west of the site.

Planning Permission (Ref: SD17A/0397) has been granted for 85 dwellings comprising 65 houses and 20 apartments at a site approximately 65 metres north west of the site boundary on Cloverhill Road, Raheen, Dublin 22. At the time of writing construction has not commenced on-site however it is anticipated construction will commence on-site in the near future.

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The Grand Canal Greenway is situated approximately 300 metres south of the site. The Gallanstown Stream, which runs alongside the canal is situated approximately 280 metres to the south of the site and the River Camac, which the Gallanstown eventually flows into, is situated approximately 760 metres to the south-east of the site.

An aerial photo showing the site and its surroundings is shown in Figure 4-1 below. A Site Location Map for the facility is shown in Appendix 1.

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Figure 4-1 Site Location and Surrounding Land Uses

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4.3 Site Infrastructure

A description of the main buildings, areas and infrastructural elements on-site is provided below.

A Site Layout Plan and a Production Building Sub-Division Flor Plan showing buildings, areas and infrastructural elements present on-site are shown in Appendix 2 and Appendix 3 respectively.

4.3.1 Site Access

Vehicles access the facility via a private entrance road connected to Crag Avenue in Clondalkin Industrial Estate. The private entrance road leads to the site entrance. Heavy Goods Vehicles travel this route to enter the site. Aside from the access road, the site boundary is closed off by boundary fencing.

4.3.2 Weighbridge

A weighbridge is situated at the site entrance in order to track and record the amount of material entering the site. All HGV traffic importing incoming material to the recovery facility is directed across the weighbridge at the site entrance before heading towards the north west of the site to a designated truck parking area.

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4.3.3 Car Parking Facilities

A staff/visitor car park is situated outside the main site in front of site reception. All staff and visitors using their personal vehicle park here before entering the site via the site reception.

4.3.1 Truck Parking Area

A large concrete yard area is present to the north west of the site. This area is used for truck parking. HGV's entering the site are directed to this parking area to await being directed to deposit materials inside the Refining Building.

4.3.2 Site Offices (Buildings A & B)

Office buildings (Building A & B) housing the site reception, various offices and staff welfare facilities is located adjacent to the site entrance. This office buildings is used by staff engaged in non-manual commercial, technical and administrative work.

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4.3.3 Concrete Yard Areas

A large portion of the site consists of a sealed concreted yard area in order to facilitate HGV/Forklift traffic movements. Sections of the yard are also used for the storage of plant and equipment. It is also proposed to install kerbing of 30 cm in height along the southern boundary of the site, and the south eastern and south western boundaries of the site and carry out some repairs of yard cracking in order to convert the southern portion of the site into a firewater containment area (The yard area slopes gently from north to south with the highest point on the yard being at the northern site boundary at 55.043 OD and the lowest point on-site being at the southern boundary at 54.282 OD).

4.3.4 Refining Area (Building D Area 5)

The Main Refining Area is housed in Building D on-site and accommodates the main Lead Production process. The area consists of a material intake/store area, a waste (dross) storage area and a processing area housing a smelt kettle, a refine kettle and a moulding area, otherwise labelled as the 'New Refinery'. A designated self-contained area for the storage of chemicals and a small office facility are also situated in the Refining Building.

4.3.5 Engineering Works Area (Building D Area 4)

The Engineering Works Area housed in Building D accommodates the carrying out of general metalworking activities relating to the working roofing materials and related ancillary products. A number of smaller melting kettles are also situated in the Engineering Works. This building also houses designated storage areas and racking for the storage of processed materials and product.

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4.3.6 Old Refinery (Building D Area 3)

Refining operations were previously carried out at this location. Refining operations have been moved to the New Refining Area (Area 5). This area is no longer in use.

4.3.7 Warehousing/Store Areas (E.g. Areas 2, 7, 10, 11 & 14)

A number of buildings/areas situated on-site serve to provide warehouse space for material, products and wastes brought on-site or manufactured or generated on-site.

4.3.8 Chemical Stores (Area 12)

Sodium hydroxide, Calcium hydroxide and Sodium nitrate (which poses an explosive hazard) are stored in a cool, dry place in a segregated, contained storage area in Building D and are protected from heat sources and mechanical impact.

4.3.9 Laboratory (Building D Area 8)

A Laboratory Facility is situated in a separate room adjacent to the Engineering Works Area in Building D. This laboratory facility is used for the purposes of testing processed Lead and verifying that processed Lead meets relevant specifications.

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4.3.10 Milling Area (Building D Area 1)

The Milling Area situated in Building D houses Milling Plant used to produce rolled lead sheet. The building also houses storage racking for the purposes of storing rolled lead sheet.

4.3.11 Maintenance Workshop Building (Building E Area 15)

A Maintenance Workshop is situated to the south east of the site (Building E). This area is used for the purposes of maintaining vehicles, plant and equipment. A small volume of hazardous materials (oils, vehicle additives) are situated in sump pallets in this building.

4.3.12 Diesel Storage Area (Building F)

Fuel for vehicles used in for the carriage of materials is situated in a designated Diesel Storage Area on-site (Building F). The Diesel Storage Area comprises two diesel tanks. These tanks are constructed on sealed concrete surfaces and bunded to provide a storage volume equivalent to 110% of the tank storage volume. A refuelling area underlain by a sealed concrete surface is situated adjacent to this bund.

4.3.13 Staff Recreation Area, Meeting Room and Welfare Facilities (Building C Area 16)

A newer building housing a staff recreation area, a meeting room and welfare facilities is situated to the north of the site (Building C). A warehouse is also situated within this building.

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4.3.14 Site Services

Electric power, lighting and space heating are all currently provided to the facility via the electricity network. A sub-station (Building G) is present on-site.

Gas is supplied to the site from the gas mains for the purposes of powering gas burners used for process heating.

Domestic wastewater generated at the facility is served by on-site foul drainage which is connected to the public foul sewer. Domestic wastewater eventually ends up being treated at Ringsend Wastewater Treatment Plant.

Currently, stormwater generated on-site is discharged to the public stormwater sewer serving the Clondalkin Industrial Estate. As discussed, under the proposal, the applicant intends on making alterations to the drainage system on-site and re-directing First Flush stormwater to foul sewer. Under the proposal, subsequent stormwater run-off, occurring after the First Flush during a prolonged or intense rainfall event, will still be discharged to the public stormwater sewer serving the industrial estate.

A potable water supply is provided to the facility via a Local Authority water mains.

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4.4 Plant and Equipment

The following main processing plant and equipment is present on-site:

- Smelt Kettle (90 tonne per batch capacity)
- Melting Kettle 1 (30 tonne per batch)
- Melting Kettle 2 (5 tonne per batch)
- Melting Kettle 3(2 tonne per batch)
- Melting Kettle 4 (2 tonne per batch)
- Refine Kettle (80 tonne per batch technical capacity)
- Block Moulding Plant
- Milling Plant (Electric Oven, Decoiler, Saw & Roller)

The following ancillary plant and equipment is used on-site to support facility operations:

- Mobile plant for handling and transport of materials.
- Gas burners - to heat melting kettles situated on-site.
- Pumping systems - for transferring molten metals.
- Cooling tower system - to cool exhaust emissions from smelting/refining operations.
- Air cyclone system - to remove large particulates from exhaust emissions.
- Baghouse filters - to remove fine and smoke particulates from exhaust emissions.
- Emission stack (Emission Point Ref. AE-1) (40 m high) - for dispersal of treated exhaust emissions.
- Palletization equipment – for packaging and palletization of finished product.
- Compressed Air system - for powering hydraulic systems and tools.

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4.5 Construction Phase Activities

The proposed activity involves alterations to the existing drainage system, namely the development of a Dual Flow Drainage System on-site. This will involve the construction of a retention tank system and the connection of this system to existing public foul and storm sewer systems. The Dual Flow Drainage System will ensure that First Flush stormwater run-off is directed to foul sewer and subsequent stormwater run-off, occurring during a prolonged or intense rainfall, is directed to public storm sewer.

The retention tank will be situated in the south eastern corner of the site. A Site Layout Plan and design specifications showing the location, layout and detailed design of the Dual Flow Drainage System can be found in Appendix 2 and Appendix 4of this EIAR respectively. These drawings also show the land use requirement associated with the retention tank and connecting pipelines.

It is expected that the construction of this drainage system will take place over short term period and will involve the following construction processes.

- The breaking and excavation of concrete yard and its removal from the site.
- The excavation and trenching of soils to required depths.
- The temporary storage of soil in skips prior to backfilling or removal from the site
- The laying of a concrete base for the retention tank.
- The construction of a GRP overground tank and a concrete underground tank.
- The construction of manholes and inspection chambers.
- The laying and connection of drainage pipework
- Backfilling, compaction and grading of soils
- Laying of new impermeable concrete yard to restore the yard area.

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Construction operations shall only be carried out during designated construction operating hours, which are proposed to be as follows:

- Monday to Friday: 8 a.m. to 7 p.m.
- Saturdays: 8 a.m. to 2 p.m.

In addition to the above, it is proposed to install two oil interceptors before the outlets of the existing surface water and proposed foul drainage systems in order to prevent the discharge of hydrocarbons from the site going forward. Further to this, it is proposed to install kerbing of 30 cm in height along the southern boundary of the site, and the south eastern and south western boundaries of the site. At the same time, it is also proposed to repair cracking that occurs in a small number of locations on-site. This will convert the southern portion of the site into a firewater containment area. (The yard area slopes gently from north to south with the highest point on the yard being at the northern site boundary at 55.043 OD and the lowest point on-site being at the southern boundary at 54.282 OD). This will provide a substantial amount of additional retention capacity on-site. It is anticipated that this will provide sufficient firewater retention capabilities for any major fire that may occur on-site.

Potential environmental impacts associated with the construction phase activities have been identified, evaluated and characterized within this EIAR. Mitigation Measures have been developed in order to minimize construction impacts.

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A Construction and Demolition Waste Management Plan for the proposed Dual Flow Drainage System is shown in Appendix 5.

4.6 Operational Phase Activities

The primary activity on-site is the Manufacture of Lead to the European Standard EN12588. The main raw material for the production process is scrap lead and this is purchased from suppliers in Ireland and abroad. Lead is manufactured on-site through a batch production process. It is then subsequently supplied either to a sister facility in the form of lead blocks or to customers after being milled into rolled sheet.

In addition to the manufacture and distribution of lead, the applicant also carries out the following activities on-site:

- The distribution of roofing materials and related ancillary products.
- The carrying out of metalworking on-site for the purposes of making products suitable for roofing applications.
- The carrying out of laboratory testing for the purposes of quality control.
- The provision of specialist advice and consultation in relation to products supplied.
- The carrying out of administrative activities relevant to the business.

Further detail on the operational phase activities listed above is provided in the Sections 4.6.1 and 4.6.2 below.

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4.6.1 Lead Production

The Lead Production process on-site consists of the following stages:

1. Material Intake
2. Smelting
3. Refining
4. Production of Lead Blocks
5. Milling of Lead into Rolled Sheets

Each stage of Lead Production is described in further detail in the sections below.

4.6.1.1 Material Intake

Scrap lead is the raw material used in Lead Production on-site. It is transported to the site on Heavy Goods Vehicles and is received, weighed and initially checked at the site weighbridge before being deposited at a stockpile in the Material Intake Store in Building D to await processing. A thorough inspection of incoming materials takes place in the Material Intake Store prior to processing.

4.6.1.2 Smelting

The first stage of the Lead Production process is the smelting of scrap lead.

Initially, scrap lead is loaded into a Smelt Kettle situated in the Refining Area to semi-purify the lead. This Smelt Kettle is heated by a gas burner. The Smelt Kettle melts the scrap and separates out the impurities as dross. When metals melt, oxides tend to form and accumulate on the surface while involatile impurities also float combining with the oxides to form a dry dusty layer called dross. This is removed from the molten metal surface by scraping it off into a dross tray. In addition, mixed metals are extracted during the process and put into a bin. Lead ash and mixed metals removed during smelting are ultimately dispatched from the site to third party, authorized waste facilities for recovery.

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The Smelt Kettle situated in the Refining Area in Building D has a 90 tonne per batch melting capacity. Approximately 80 tonnes of smelted lead can be produced from the process, with approximately 10 tonnes of lead ash and mixed metals being taken off the process. Currently, the facility operates between the hours of 06:00 – 16:00, Monday to Friday. One batch of scrap lead can be processed in the Smelt Kettle during these hours having regard to the Smelt Kettles physical/technical capacity. The company has however previously operated from 06:00 – 12:00 midnight, Monday to Friday, over a several year period under the terms of its existing licence. Two batches of scrap lead can be processed in the Smelt Kettle per day during these operating hours. As such, the Melting Capacity at the Smelt Kettle is 180 tonnes per day. There are no plans to increase production capacities on-site.

In addition to the main Smelt Kettle, four smaller Melting Kettles (heated by gas burner) are situated in the Engineering Works Area in Building D. These kettles consist of a 30 tonne capacity kettle, a 5 tonne kettle and two 2 tonne kettles. They are operated intermittently producing a maximum of one batch of output per day each (regardless whether operating hours are between 06:00 – 16:00 or 06:00 – 12:00 midnight) and in total have a Melting Capacity of 39 tonnes per day.

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In all, combining the main Smelt Kettle and the four smaller Melting Kettles, the Melting Capacity per day at the facility would be 219 tonnes per day. This Melting Capacity dictates the throughput capacity per day for subsequent stages of processing.

4.6.1.3 Refining

The next stage in the lead manufacturing process is the Refining stage. Lead which has been put through the Smelting process is transferred in its molten state to a Refine Kettle (heated by gas burner) in the Refining Area where it is further refined.

Molten lead is pumped from the Smelt Kettle into the Refining Kettle and chemicals (sodium hydroxide, calcium hydroxide and sodium nitrate) are added to remove tin and antimony. Caustic tin dross (CTD) and caustic antimony dross (CAD) are removed from the surface of the Refining Kettle and collected in bins. This dross is shipped as hazardous amber listed waste under controlled conditions to waste facilities in the UK, Germany and Poland.

This refining process removes unwanted elements of input material thereby purifying the lead to the required standard.

Occasionally, where demand necessitates it, a second, smaller Refine Kettle is used in conjunction with the main Refine Kettle.

A Process Flow Diagram depicting the Smelting/Refining process at the facility is shown in Figure 4-2.

Exhaust emissions from smelting and refining processes are directed via duct channels to an abatement system and subsequently discharged to air via a 40 metre high stack (Emission Point Ref: AE-1).

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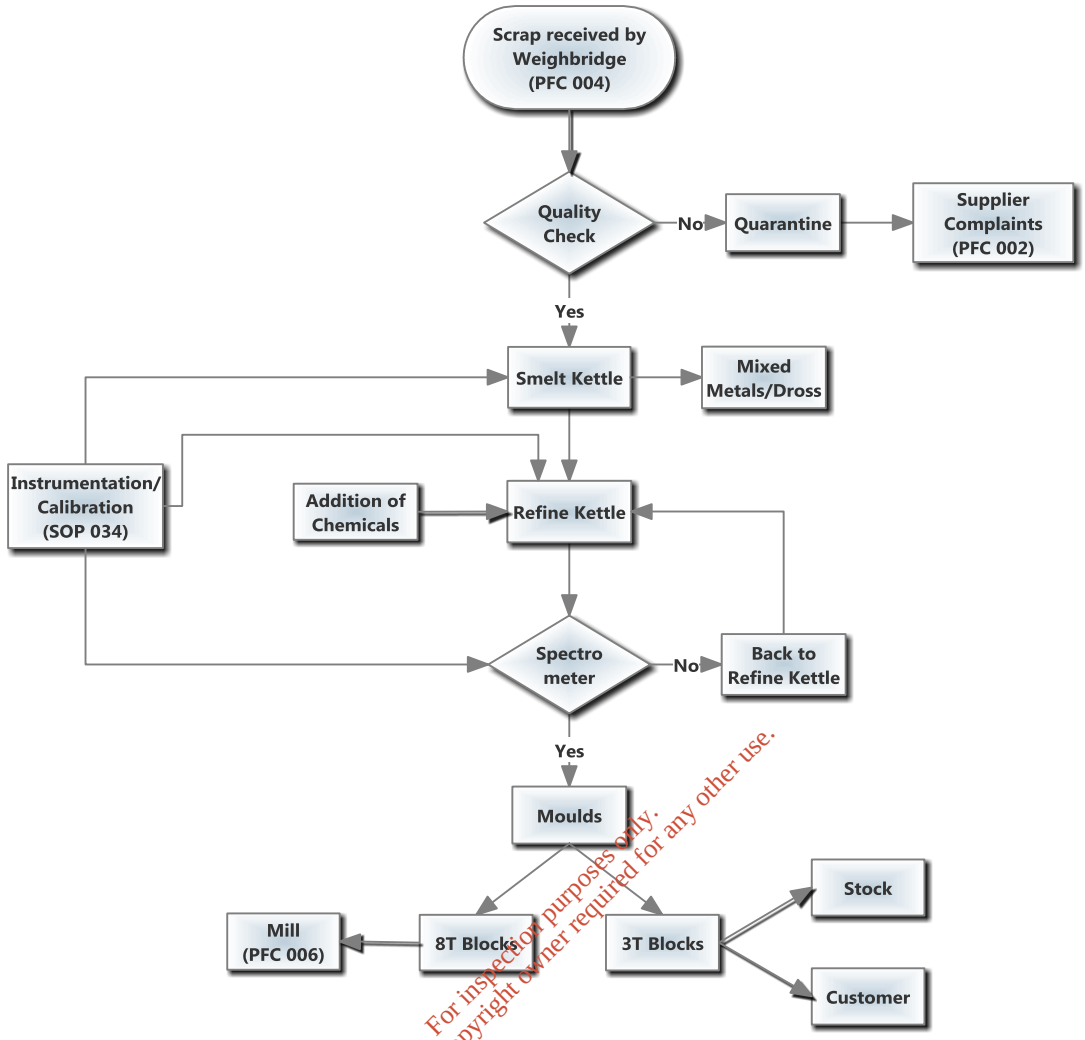

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Figure 4-2 Overview of Refining Process

4.6.1.4 Production of Lead Blocks

After the refining process, purified, molten lead is pumped and cast into block moulds to produce either 3.2 tonne or 8 tonne lead blocks. 3.2 tonne lead blocks are stored on-site prior to being dispatched to a sister facility owned by the Calder Group for further processing. 8 tonne blocks are milled on-site to produce rolled lead sheeting.

4.6.1.5 Milling of Lead into Rolled Sheets

8 tonne lead blocks are brought to the Milling Area in Building D and initially heated up by electric oven before being milled to the desired thickness and width to form sheet lead. The sheet lead is passed through a decoiler and a sawing processes before being formed into rolled lead sheets. Rolled lead is packaged, palletized and stored on racking in the milling area prior to dispatch to customers in the construction industry as per demand.

A Process Flow Diagram depicting the Milling Process is shown in Figure 4-3.

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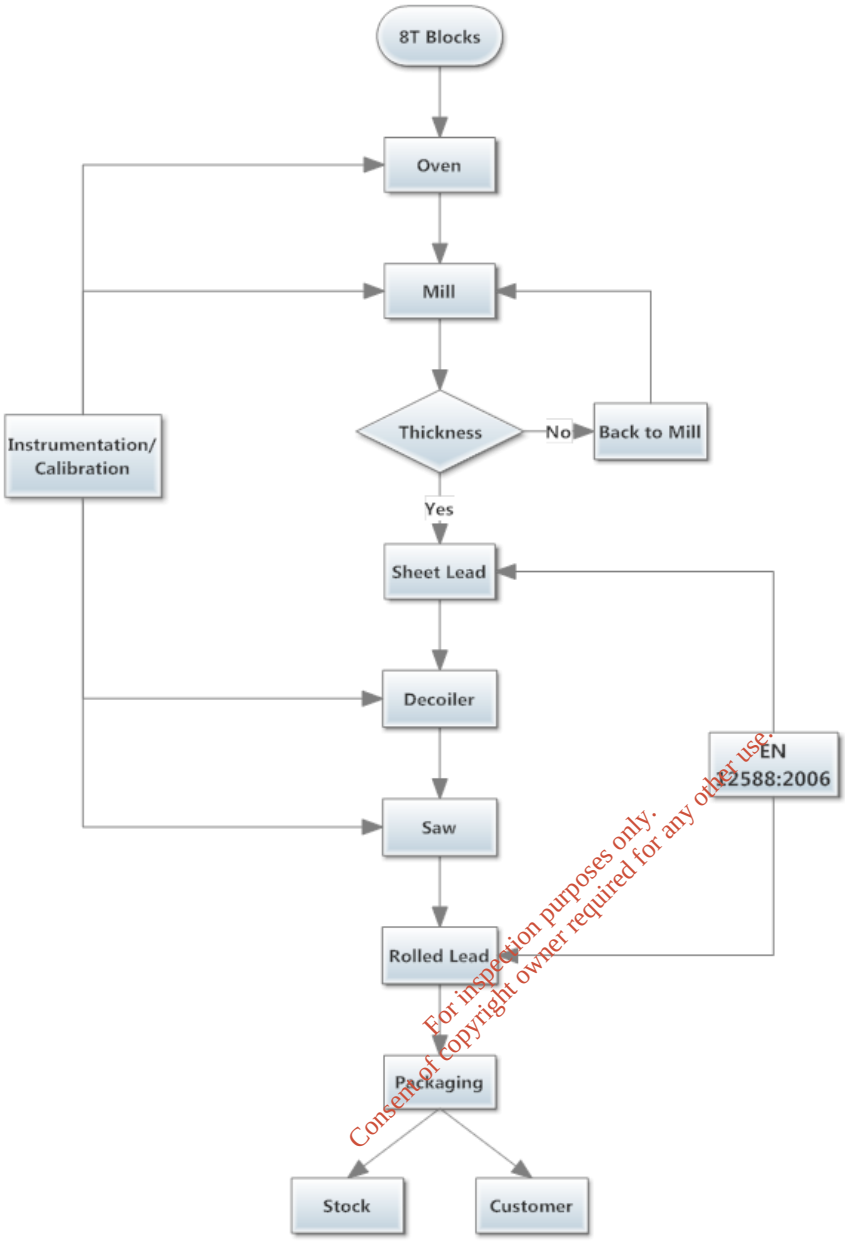

Figure 4-3 Overview of the Milling Process

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4.6.2 Other Activities On-site

4.6.2.1 Distribution of Products

The applicant is involved in the distribution of lead materials manufactured on-site, and roofing products and materials purchased from third parties such as cavity trays, chimney trays, patination oil, copper, zinc, aluminium and ancillary roofing products.

The applicant has warehousing facilities in a number of buildings/areas on-site for the storage of materials and products pending onward distribution to customers. In addition, they have material handling equipment in the form of a number of forklifts and equipment for the packaging and palletization of materials.

4.6.2.2 Metal-Working Activities

The applicant has an Engineering Works Area on-site where manufactured and sourced products and materials may undergo general metalworking processes where needed for the purposes of producing more bespoke roofing products that are fit for specific intended purposes.

4.6.2.3 Laboratory operations

A laboratory facility is located on-site for the purposes of material testing and verifying manufactured lead meets standards.

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4.6.2.4 Specialist Advice and Consultation

The applicant provides specialist advice on the specifications and installation of products and materials they manufacture and supply. The applicant has site offices to cater for this service.

4.6.2.5 Administrative Activities

The offices on-site also serve to accommodate staff members responsible for non-manual commercial, technical and administrative work (e.g. management of the business, sales and marketing, design, accounts).

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4.7 Proposed Dual Flow Drainage System

The applicant proposes on making alterations to the existing drainage system on-site. Currently, all stormwater generated in roof and yard areas is directed to the public stormwater sewer before being discharged to the Gallanstown Stream. These stormwater discharges on occasion can have elevated levels of lead. The applicant proposes on constructing a Dual Flow Drainage System on-site (otherwise known as the 'Water Retention Tank and Balancing System' in adjoining engineering drawings) to ensure stormwater discharges containing elevated levels of lead are discharged to foul sewer.

It is proposed to direct initial 'First Flush'[1] stormwater run-off containing elevated concentrations of pollutants to an on-site retention tank where it will discharge gradually from the tank to foul sewer at a rate of 2 litres/second. 'First flush' is a well explored phenomenon in which the first portion of stormwater runoff in a storm event has a higher concentration of pollutants.

This treatment storage tank is 202 m3 in size. During an exceptional rainfall event where there is prolonged or intense rainfall stormwater run-off will eventually fill the retention tank before by-passing the tank and being directed to the public stormwater sewer and then onto the Gallanstown Stream. It is expected that stormwater run-off being discharged to the Gallanstown Stream will have negligible levels of pollutants due to the occurrence of the First Flush effect. This is explored further in the Water Chapter of this EIAR.

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The development of the dual flow drainage system will be in accordance with best management practices for stormwater and sustainable drainage systems as defined in the Greater Dublin Strategic Drainage Study, namely the concept of retaining and treating initial first flush stormwater run-off defined in Section E1.1.4 of Appendix E of Volume 2 (New Development) of the Regional Drainage Policies Technical Document. The Dublin Greater Strategic drainage Study guidance can be paraphrased as follows:

- The quality of storm water runoff is an issue for frequent small events. This is due to the flush of debris and sediment (e.g. lead dust) from the catchment surface compounded with the fact that the receiving waters are still flowing a base flow conditions (i.e. little dilution). With large rainfall events or high river flow there is less impact on the receiving water.
- The Dublin Greater Strategic drainage Study proposes that retention storage be provided for the equivalent rain runoff from a rainfall depth of 10 mm or 15 mm in order to prevent the discharge of first flush stormwater run-off containing elevated levels of pollutants to receiving waters flowing under base flow conditions.

The retention tank in question is sized to cater for a 10 mm rainfall event occurring on-site in accordance with the guidance. The dual flow system will ensure the initial part of stormwater run-off will be retained and directed to foul sewer and then onto Ringsend Wastewater Treatment Plant. The applicant has been informed by Irish Water through their authorized agent South Dublin County Council that they will accept discharges to foul sewer at a rate of 2 L/sec with a maximum lead concentration of 500 µg/l.

[1] First Flush is defined as *'the discharge of a larger mass or higher concentration in the early part of a storm relative to the later part of the storm. The term can be applied to any contaminant. The magnitude of the first flush will depend on site specific conditions, but the term first flush is applicable.'* (First Flush Phenomenon Characterization, California Department of Transportation, Division of Environmental Analysis, August 2005)

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A Site Layout Plan showing the location on-site and layout of the proposed dual flow drainage system are shown in Appendix 2. Design specifications showing the location, layout and detailed design of the Dual Flow Drainage System are shown in Appendix 4.

4.8 Site Management

4.8.1 General

The facility employs 25 people. Current operating hours for the facility are between 06:00 – 16:00, Monday to Friday. The company has however previously operated from 06:00 – 12:00 midnight, Monday to Friday, over a several year period under the terms of its existing licence. It is hoped that business levels will increase going forward and the company will return to operating during these extended hours, although this is dependent on business and economic factors.

4.8.2 Management Systems

The applicant carries out their facility operations in accordance with a Quality Management System certified to ISO 9001: 2015, an Environmental Management System certified to ISO 14001: 2004, and a Health and Safety Management System certified to OHSAS 18001:2007.

They have identified Risks and Opportunities relating to the Quality, Environmental and Health and Safety aspects of their operations have established policies, procedures and processes to manage and control their operations, meet the requirements of the standards and ensure conformance with their compliance obligations.

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They actively promote leadership engagement, employee training and staff awareness within the organization. They have established Quality, Environmental and Health and Safety objectives for the organization and management programmes to achieve goals and objectives. They periodically audit, review, evaluate and improve their management systems and internal practices.

They have a system for recording and correcting/preventing any non-conformances raised pertaining to their management systems, their legal requirements or the requirements of their EPA Industrial Emissions Licence. They have monitoring and measuring resources in place to track their company performance in Quality, Environmental and Health and Safety management.

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4.8.3 Operating Procedures

The company has the following procedures in place to manage and control operational processes:

- EHS Guidelines for Site Contractors – SOP 014
- Control of Sub-contractors/Suppliers – SOP 016
- Waste Management – Non-hazardous Waste – SOP 031
- Maintenance of Equipment – SOP 032
- Calibration of Equipment – SOP 034
- Waste Management – Hazardous Waste – SOP 037
- Manufacture of Window Weights – SOP 042
- Manufacture of Sheet Lead – SOP 044
- Customer Complaints Procedure – SOP 046
- Weighbridge – SOP 047
- Purchasing – SOP 048
- Sales Order – SOP 053
- Supplier Complaints Procedure – SOP 055
- Calibration and Use of Spectrophotometer – SOP 056

4.8.4 Environmental Management

The applicant operates under an Environmental Management System (EMS) accredited to ISO 14001: 2015. The scope of the applicant's EMS covers activities occurring at its Clondalkin facility, namely metal processing and the warehousing and distribution of metal products. The EMS was set up by the company to ensure the continual improvement of their environmental performance and to ensure conformance with their compliance obligations, including the requirements of their existing Industrial Emissions Licence.

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Under their EMS, the applicant has identified and evaluated their significant environmental aspects and environmental impacts associated with their facility operations. On the back of this, the company has established, implemented and continually maintain environmental controls and mitigation measures at its facility to prevent and minimize environmental impacts associated with its significant environmental aspects. Environmental controls and mitigation measures in place at the facility are discussed in further detail in the sections below and in Section 4.9 of this document.

In addition to the above, having considered the company's environmental risks and opportunities, significant environmental aspects and compliance obligations (including conditions of their existing Industrial Emissions Licence), the applicant has established a number of Environmental Objectives and an Environmental Management Programme (EMP) for the purposes of managing their significant environmental aspect and impacts. The company's Environmental Objectives and EMP are reviewed and updated every 6 months.

The applicant proposes updating their EMS to take account of any new conditions relating to environmental management or emission control that may be included in their revised Industrial Emissions licence.

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4.8.5 Waste Management

The applicant carefully manages the various waste streams that are generated from on-site activities. Standard Operating Procedures for the management of non-hazardous waste and hazardous waste have been established under the company's EMS to ensure waste is properly identified, packaged, stored and dispatched to treatment facilities.

The main raw material for the refining process is scrap lead. The import of scrap lead is regulated by legislation EU Regulation 1013/2006 on Shipments of Waste. The applicant is registered with the National TFS Office under the Broker and Dealers Regulations. From an environmental perspective, scrap lead is considered as a green listed waste and controls are in place to ensure that an Annex VII accompanies each load and that the hauliers involved in the transport of such material hold the appropriate permits. A Process Flow diagram showing how imported scrap lead is managed by the company is shown in Figure 4-4 below.

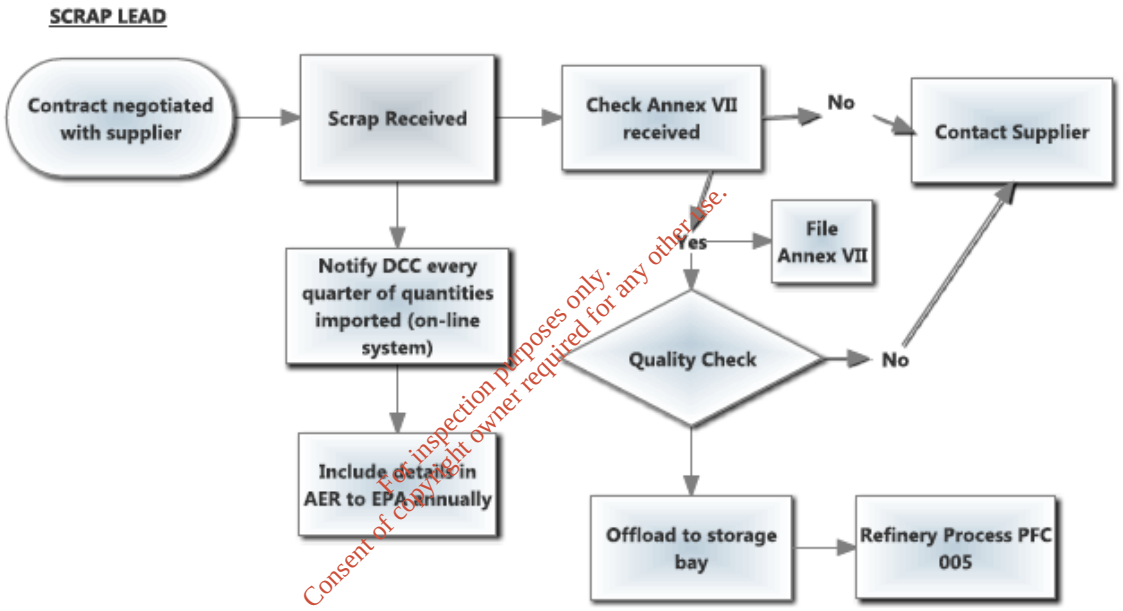

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Figure 4-4 Overview of how Imported Scrap Lead is managed

Wastes generated during the refining process include mixed metals, and hazardous wastes such as lead ash, lead dross, caustic tin dross, caustic antimony dross, pump dross and bag house dross. All of these waste streams are carefully packaged and sent off-site to various waste facilities abroad for recycling. The transport of all such waste is regulated by EU Regulation 1013/2006 on Shipments of Waste. Process Flow diagrams showing how mixed metal and dross waste is managed by the company is shown in Figure 4-5 and Figure 4-6 below.

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Figure 4-5 Overview of how Mixed Metals Waste is managed

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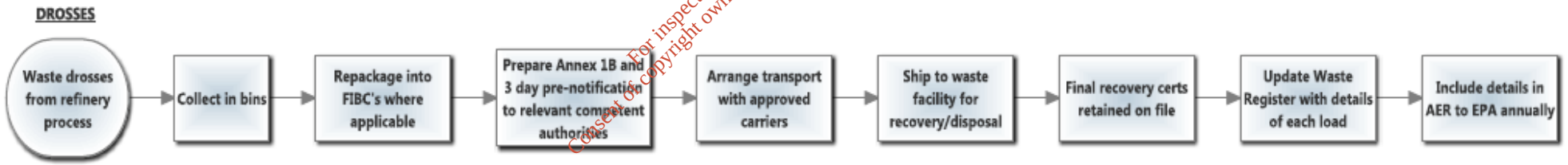

Figure 4-6 Overview of how Drosses are managed

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Off-cuts and metal sawdust generated during milling operations are collected and reprocessed in the refining process.

Non-hazardous waste types which arise regularly during on-site storage and distribution activities include cardboard, paper, plastic, aluminium, wood, steel and mixed municipal waste. A Process Flow Diagram showing how non-hazardous waste is managed on-site is shown in Figure 4-7 below.

Figure 4-7 Overview of how non-hazardous waste is managed

Small quantities of other hazardous waste types such as waste oils, WEEE, fluorescent lights, aqueous waste and filter bags arise intermittently on-site. A Process Flow diagram showing how other hazardous waste is managed on-site is shown in Figure 4-8 below.

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Figure 4-8 Overview of how Other Hazardous Wastes are managed

The quantity of waste that was generated on-site in the last reporting year (2018), as well as the name and licence number of waste destination facilities, is shown in the table below.

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Table 4-1 Quantity of Waste Generated (2018)

EWC Code	Hazardous (Yes/No)	Description of waste	Quantity (Tonnes)	Waste Treatment Operation	Destination Facility	Permit Ref Number
10 04 02*	Yes	Dross and skimmings from primary and secondary production	402.93	R4	H.J Enthoven & Sons, Darley Dale Smelter, Matlock, Derbyshire DE4 2LP, United Kingdom	BL5598
10 04 02*	Yes	Dross and skimmings from primary and secondary production	422.6	R4	Fenix Metals Sp.z o.o, Ul. Strefowa 13, 39-442 Chmielów, Poland	SR.IV-6618/20/05
10 04 02*	Yes	Dross and skimmings from primary and secondary production	61.87	R4	Feinhütte Halsbrücke GmbH, Krummenhennersdorfer Strasse 2, D-09633 Halsbruecke, Germany	SC0730008
13 02 08*	Yes	Waste Oil	0.4	R1	Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois	WCP-DC-08-1116-01
15 02 02*	Yes	Waste Filters	1.377	R3	Rilta Environmental Ltd, 402 Greenogue Business Park, Rathcoole, Co. Dublin	W0192-03
16 05 07*	Yes	Adsorb contaminated with oil	0.392	R3	Rilta Environmental Ltd, 402 Greenogue Business Park, Rathcoole, Co. Dublin	W0192-03
20 01 21*	Yes	Fluorescent Tubes	0.025	R5	Irish Lamp Recycling Co Ltd., Woodstock Industrial Estate, Athy, Co. Kildare	WFP-KE-14-0072-01
15 01 03	No	Wood	9.7	R3	Thorntons Recycling, Kileen Road, Ballyfermot, Dublin 22	W0044-02

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EWC Code	Hazardous (Yes/No)	Description of waste	Quantity (Tonnes)	Waste Treatment Operation	Destination Facility	Permit Ref Number
20 01 01	No	Paper and Cardboard	3.4	R3	Thorntons Recycling, Kileen Road, Ballyfermot, Dublin 22	W0044-02
20 03 01	No	Mixed Municipal Waste	16.78	D1	Thorntons Recycling, Kileen Road, Ballyfermot, Dublin 22	W0044-02
20 01 01	No	Paper	0.62	R3	Pulp Recycling Ltd., Riverside, Tallaght, Dublin 24	WCP-DC-09-1218-01
20 01 36	No	Waste Electrical and Electronic Equipment	0.304	R4	Recycle IT, Unit 14/2 Crag Terrace, Clondalkin Industrial Estate, Dublin 22	WFP-DS-10-0010-04
17 04 07	No	Mixed Metals	128.5	R4	Metallo Chimique, Nieuwe Dreef 33, B-2340 Beerse, Belgium	BL5598

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4.8.6 Natural Resource Usage

Scrap lead is the main raw material input that goes into the Lead Manufacturing process at the facility. A summary of the quantity of scrap lead accepted and processed at the facility in the last three years is shown in the table below.

Table 4-2 Quantity of Scrap Lead Accepted and Processed 2016 - 2018

	Quantity of Scrap Lead Accepted on-site, (tonnes)	Quantity of Scrap Lead remaining On-site at the end of the year, (tonnes)	Quantity of Scrap Lead Processed in the Year (tonnes)
2016	18,113	926	17,681
2017	17,300	830	17,396
2018	17,089	1,214	16,705

A summary of natural resources used at the facility for the last three years is shown in the table below.

Table 4-3 Resource Usage 2016 - 2018

	Total Energy Used (MWh)	Electricity Consumption (MWh)	Water Use (m3)
2016	3,180	526	1,616
2017	3,046	527	1,610
2018	2,927	519	1,610

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4.8.7 Hazardous Material Storage

The following table provides an overview of the quantity of hazardous materials typically stored on-site:

Table 4-4 Hazardous Materials Stored On-site

Material/ Substance	CAS Number	Danger Category	Amount Stored (tonnes)	Annual Usage (tonnes)	Nature of Use	Hazard Statement
Lead (scrap/ingot)	7439-92-1	N	2,500	18,000	Used to produce refined lead	H360FD, H362, H372
Tin	7440-31-5	N/A	1	1	Used in solders	N/A
Caustic Soda pearl	1310-73-2	C	24	96	Refining process	H290, H314
Sodium Nitrate	7631-99-4	O	24	24	Refining process	H272, H319
Calcium Hydroxide	1305-62-0	C	1	2	Refining process	H315, H318, H335
Linseed Oil	8001-26-1	N/A	0.1	0.2	Lubricant during sheet lead milling process	N/A
Gas Oil	68814-87-9	F, Xn, N	2.5	7	Fuel for fork trucks	H226, H304, H332, H373, H411
Diesel	68334-30-5	F, Xn, N	2.5	7	Fuel for company cars	H226, H304, H332, H373, H411
Argon	231-147-0	N/A	0.2	0.25	Gas for Spectrometer	H280
Acetylene	74-86-2	F+	0.024	0.036	Welding	H220, H230, H280

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Material/ Substance	CAS Number	Danger Category	Amount Stored (tonnes)	Annual Usage (tonnes)	Nature of Use	Hazard Statement
Oxygen	7782-44-7	O	0.05	0.1	Welding	H270, H280
Propane	74-98-6	F+	0.5	1	Heat shrinking packaging	H220
Lead Dross (EWC 10 04 02*)	69029-52-3	T, Xn, C, N	100	1,200	Waste from refining process - recycled abroad	H300, H317, H318, H341, H360FD, H372, H410
Mixed Metals (EWC 17 04 07)	N/A	N/A	30	130	Waste from refining process - recycled abroad	N/A
Hydraulic Oil 46	N/A	N/A	0.4	0.6	Oil used for maintenance	N/A
Synthetic Oil 5/30	N/A	N/A	0.04	0.06	Oil used for maintenance	N/A

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4.8.8 Environmental Monitoring

The applicant proposes on undertaking a schedule of Environmental Monitoring at its facility to measure the type, nature, quantity and composition of emissions to the environment. It is proposed to undertake the following types of Environmental Monitoring on-site:

- Stack Emission Testing on a biannual basis at stack emission point 'AE-1' (Baghouse filter exhaust).
- Quarterly monitoring of stormwater discharges at proposed emission point 'SE1' (which directs 'first flush' stormwater from roof/yard areas to foul sewer).
- Biannual monitoring of by-pass stormwater discharges at existing emission point 'SW4' (which directs stormwater run-off, occurring after the 'first flush' during a prolonged and/or intense rainfall period, to the public stormwater drainage system).
- Environmental Noise Monitoring, upon receipt of a noise complaint.

Emission point location are shown on the Site Layout Plan adjoining this EIAR contained in Appendix 2.

4.8.9 Emergency Preparedness and Response

The applicant has identified and planned for potential emergency situations that may occur on-site having regard to hazards and risk present on-site.

A procedure has been developed to deal with potential emergency situations and potential accidents that can have an impact on the environment and how the company will deal with them. The procedure covers action in the event of fire and other emergency situations. The procedure also incorporates spill response training for dealing with hazardous liquid spills that may pose a threat to the environment.

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Fire drills are carried out every 6 months. The emergency preparedness and response procedure is reviewed at a minimum every 12 months and will be revised in light of issues arising after the occurrence of accidents or emergency situations.

Training in the emergency preparedness and response procedure is provided to all employees during Induction.

In addition, an Environmental Liability Risk Assessment has been prepared for the proposed activity. All Environmental Risks associated with the site have been evaluated as being of a low risk. A Risk Management Programme has been established to facilitate further management and mitigation of Environmental Risk. This ELRA is shown in Appendix 6.

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4.8.10 Fire Prevention and Control

In addition to the Emergency Preparedness and Response measures detailed in Section 4.8.9 above, the following measures are in place on-site to assist with the prevention and control of fires on-site:

- A programme of inspection and preventative maintenance for equipment that poses a risk such as gas burners and melting kettles has been established and will be implemented on an ongoing basis at the facility.
- Standard Operating Procedures to ensure the effective and safe operation and control of processes have been established for working activities at the facility that pose risk.
- Flammable liquids are stored on-site in designated bunded storage areas away from heat sources.
- Sodium hydroxide, Calcium hydroxide and Sodium nitrate (which poses an explosive hazard) are stored in a cool, dry place in a segregated, contained storage area in Building D and are protected from heat sources and mechanical impact. Sodium nitrate is stored in accordance with national explosives legislation. The facility is a licensed factory/magazine with the Department of Justice under this legislation.

4.8.11 Firewater Retention

In a fire scenario shut off valves will be shut at the existing storm sewer and proposed foul sewer outlets. Initially, the underground tanks and the water retention tank, which will be constructed on-site as part of the Dual Flow Drainage System proposal, will be capable of retaining 112 and 202 m3 of potentially contaminated firewater which may arise during a fire scenario on-site respectively. In a fire scenario firewater will make its way to these tank by way of the drainage network on-site.

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Further firewater retention facilities will be provided on-site in the unlikely event the capacity of the above mentioned tanks is exceeded by the volume of contaminated firewater generated in a fire scenario. Overspill from the tank will flow into the sites water tight drainage system, which will be sealed through the use of the aforementioned shut off valves, before overflowing to the sites concreted, yard area. As part of this proposal, it is proposed to install kerbing of 30 cm in height along the southern boundary of the site, and the south eastern and south western boundaries of the site in order to convert the southern portion of the site into a firewater containment area. This will provide a substantial amount of additional retention capacity on-site. It is anticipated that this will provide sufficient firewater retention capabilities for any major fire that may occur on-site.

In summary, the proposed underground tanks, the proposed water retention tank, the existing site drainage network and the proposed kerbed, southern section of the site yard area will provide firewater retention capabilities on-site.

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4.8.12 Decommissioning and Closure

A non-costed Closure Plan has been submitted as part of this application. This Closure Plan identifies and plans for closure tasks and residuals management (i.e. known environmental liabilities) at the time of facility closure and decommissioning and aims to ensure that the necessary measures are taken to prevent environmental pollution occurring at the site during or after closure and decommissioning of the facility.

Generally, the Closure Plan covers the following aspects of closure and decommissioning of the facility:

- Plant and Equipment Decontamination
- Plant and Equipment Decommissioning
- Demolition
- Raw Material, Finished Product and Waste Disposal and/or Recovery
- Programme/Timeframe for Delivery

The following criteria have been established to set the benchmark for the successful closure of the site:

- All buildings/working areas, plant and equipment on-site should be safely cleaned decontaminated using standard procedures and authorised contractors.
- The site and all buildings on-site shall be safely secured from trespassers.
- All potential health and safety risks on-site should be adequately controlled.
- All plant and equipment remaining on-site as a fixed asset shall be stored on-site in a secure location.
- All hazardous materials present on-site shall be removed the site.
- All wastes generated during closure should be handled, stored and disposed of/recovered in a manner that complies with regulatory requirements.
- All documentation relating to waste and materials management and removal during the closure process should be retained.
- All documentation relating to plant resale/decommissioning during the closure process should be retained.
- The site, inclusive of underlying soil and groundwater, should not be affected by contamination. This should be verified using environmental monitoring data (e.g. soil, GW and/or SW testing) and a soil/groundwater assessment at the time of closure (if required).
- The company shall comply with all the conditions of its IE Licence during the closure scenario.
- Sufficient funds should be available to cover the full cost of closure
- A Closure Audit should be carried out in accordance with EPA guidelines at the time of closure.
- The EPA should be satisfied that Clean Closure has been achieved on-site.

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The full Closure Plan can be found in Appendix 7.

4.9 Emission and Environmental Control and Mitigation Measures

4.9.1 Air Emissions

Waste gases arise on-site from the operation of Melting Kettles during smelting and refining operations. As such, the main environmental discharges from the plant are air emissions from

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smelting and refining operations containing lead and other metal dusts. An Air Pollution Abatement System has been set up on-site to reduce the level of pollutants in air emissions.

Metal-dust laden emissions are channelled to and pass through a cyclone filter, where the larger particles are separated from the air flow. Subsequently the emissions pass through a series of bag filters which remove the fine particulates. The bag filter system is periodically injected with lime, which absorbs heavy smoke particulates. After passing through the bag filter waste gases are emitted via a 40 m high stack which allows for dispersal.

There are a number of minor emission sources on-site also in the form of gas burners. These are for the purpose of energizing Melting Kettles used for the melting of metals. These burners will result in the release of minor levels of combustion gases associated with natural gas combustion (e.g. CO and NOx). Given their size they are not considered to be significant sources of emissions to air according to EPA Criteria on minor emission sources (rated thermal input is <1MW for each).

4.9.2 Fugitive Dust Emissions

Fugitive metal dust can arise on-site due to the storage, handling, transport and processing of metals. In order to minimize fugitive dust emissions to ambient air, all raw material, intermediates and finished product is stored indoors and processing operations (smelting/refining, milling and metal working activities) take place indoors. In addition, all trucks are off-loaded inside Building D in the Material Intake Store to reduce lead dust emissions to the environment. A roadsweeper cleans the yard area on a weekly basis to further minimize the amount of dust generated in the yard

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A number of additional measures have recently been implemented to reduce fugitive dust emissions to the non-process yard area on-site. These are as follows:

1. A water spray is used during loading of scrap lead into hopper/conveyor belt to suppress lead dust in the refining area.
2. Internal floors in processing areas in the Refining Area, Engineering Works Area and Milling Area are cleaned using a vacuum sweeper on a daily basis.
3. Water misters are used during offloading of incoming raw materials to dampen down dust in the Material Intake Store.

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4.9.3 Noise Emissions

Sources of noise on-site include site compressors, extractor fans and conveyors, material handling, loading and unloading operations, the operation of forklifts, the movement of heavy goods vehicles on-site, metal working activities, the operation of processing plant and equipment involved in production activities on-site and the operation of ancillary equipment.

Noisy plant and processes are situated within buildings on-site in order to ensure the minimization of noise emanating from the site. Processing operations associated with Lead Production (Smelting, Refining, Casting and Milling), metal working operations, and the loading and unloading of material takes place indoors.

4.9.4 Aqueous Emissions

No process effluent arises on-site as the lead production activity is a dry process. A very small volume of water is only used occasionally to wet the lead presses and this typically evaporates. Any excess that does not evaporate is collected and reused in the process. Sanitary and canteen effluent is discharged via the public sewerage system.

The site stormwater drainage system currently serves non-process areas including yard areas and roof areas. Currently, stormwater generated in these areas is discharged to the public stormwater sewer via the existing emission point SW4. As discussed in Section 4.7, the development of a Dual Flow Drainage System and the redirection of 'first flush' stormwater to public foul sewer is proposed under this Licence Review. The purpose of the Dual Flow System is to ensure better environmental protection by re-routing 'first flush' run-off, which typically contains elevated levels of pollutants to foul sewer. During exceptional rainfall events involving intense or prolonged rainfall by-pass stormwater, which is expected to contain negligible levels of pollutants, will be discharged to public storm sewer and then onto the Gallanstown.

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A number of other controls/measures will be in place on-site to prevent the build-up of lead dust on the yard and the subsequent run-off of stormwater containing elevated levels of lead. These are as follows:

- No outdoor metal storage takes place on-site in order minimize the build-up of lead dust in the yard. All incoming scrap metal deliveries are unloaded and stored indoors in the Material Intake Store in Building D to protect against stormwater lead contamination
- A roadsweeper sweeps the yard weekly to reduce lead dust levels in the yard.
- A series of existing settlement tanks are present on-site. In the event of the development of the dual flow system these settlement tanks will be retained to treat any by-pass stormwater discharging from the site to public storm sewer and then onto the Gallanstown Stream. These settlement tanks will minimize the amount of suspended particles in stormwater emanating from the site.
- Silt traps are present along site surface water lines to capture suspended particles.
- The drainage system is cleaned out on a yearly basis by a service provider to ensure functionality and to keep lead concentrations in stormwater run-off low.

In addition to the above, a number of measures are in place to reduce the generation of fugitive lead dust, which are already discussed in Section 4.9.2.

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Other measures are in place to prevent the release of hazardous substances to the environment. A reinforced mass concrete bund is situated on-site to act as secondary containment for two diesel primary storage tanks, in order to prevent the release and run-off of hazardous materials to the drainage system. In addition, oils (e.g. motor oil, hydraulic oil) are stored on-site in pre-fabricated plastic bunds in the Maintenance Workshop Building. The integrity and water tightness of all of these bunds are tested every three years in accordance with the requirements of the licence.

A spill response procedure is in place on-site and spill containment kits are provided on-site to ensure any spills or releases of hazardous materials are a promptly responded to and adequately dealt with.

It is proposed to install two oil interceptors before the outlets of the foul and surface water drainage systems in order to prevent the discharge of hydrocarbons. This will be serviced on annual basis to ensure functionality.

Fire prevention and control systems are in place on-site in order to minimize the likelihood and prevent a major fire scenario which could result in the release of contaminated firewater to the environment. These are discussed in Sections 4.8.9 and 4.8.10. Underground tanks and a water retention tank, which from part of the dual flow drainage system, will be present on-site which will serve to retain any firewater that may be generated on-site. In addition, the sites stormwater drainage system and the southern section of the area, which will act as a firewater containment area on-site, will provide additional firewater retention capabilities.

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4.9.5 Emissions to Ground

There are no direct discharges to ground. The entire site has been rendered with a hard surface to ensure there is no potential for the leaching of contaminants to ground.

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5. Population and Human Health

5.1 Introduction

This section of the EIAR covers the existence, activities, wellbeing and health and safety of people and addresses the potential impacts of the proposed activity upon the surrounding human environment, communities and individuals.

The proposed activity has the potential to impact human beings in a number of ways and may have impacts upon population, health and safety, tourism, recreation, air quality, noise, traffic and economic activity.

Some aspects related to the human environment are addressed in other sections of this EIAR. These sections are cross referenced in this section where appropriate.

5.2 Assessment Methodology

The study of how the human environment will be impacted by the proposed activity involved carrying out the following tasks:

1. Conducting a walkover survey of the site and the local area.
2. Carrying out a review of historic and existing mapping and aerial photography for the local area and wider region.
3. Reviewing population information from the Central Statistics Office for the relevant geographical area
4. Reviewing socio-economic information for the local area and wider region contained within South Dublin County Council's Development Plan 2016-2022.
5. Evaluation, analyzing and assessing the proposed activity and its impacts upon aspects relating to Population and Human Health.
6. Preparation of a Population and Human Health chapter for the EIAR.

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The above was carried out by a Senior Environmental/Planning Consultant with many years' experience carrying out and coordinating EIS's/EIAR's and assessing the impact of existing and proposed development upon population and human receptors.

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5.3 Baseline Environment

The applicant's facility is situated in Clondalkin Industrial Estate in the townland of Ballymanaggin, Dublin 22. The site is situated approximately 1 km north of Clondalkin Town Centre and is immediately surrounded in all cardinal direction by commercial and industrial facilities. The broader area in which the facility is situated is distinctly urban in character.

5.3.1 Land Use and Zoning

The site is situated at 6 Station Road in Clondalkin Industrial Estate in the townland of Ballymanaggin, Dublin 22. Clondalkin Industrial Estate is a well-established industrial area set within the broader urban environment of Clondalkin. The Dublin to Cork railway line traverses directly north of the site. The M50, traversing in a north-south direction, runs approximately 720 metres to the east of the site at its nearest point.

Under the South Dublin County Council Development Plan 2016 – 2022 the site, as well as Clondalkin Industrial Estate as a whole, is zoned Objective EE – To provide for enterprise and employment related use. It is the policy of the Council to facilitate and support the growth of the economy of South Dublin County and the Greater Dublin Area through strengthening and renewing existing employment centres such as Clondalkin Industrial Estate.

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5.3.2 Potential Receptors

5.3.2.1 Housing

James Connolly Park housing estate is situated south-west of the site with the nearest dwelling in the estate situated approximately 100 m from the site boundary. A number of detached, semi-detached and terraced dwellings are situated approximately 140 metres to the south west of the site just west of the Clondalkin Industrial Estate boundary in an area bounded by the estate, Station Road, Ninth Lock Rock and the Grand Canal. A newly built residential estate is situated approximately 150 metres north west of the site off Cloverhill Road the other side of the Dublin to Cork Railway Line. These residential areas constitute the most vulnerable receptors to noise emissions from the facility due to their proximity to site. It is noted that a parcel of land north-west of the site on the Cloverhill Road has received planning permission for the development of houses and apartments (Planning Ref: SD17A/0397), therefore potential exists for new housing to be located here.

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5.3.2.2 Hospitals and Community Facilities

The nearest hospital to the site is the Cherry Orchard Hospital in Ballyfermot which is situated 1.8 km to the north-west of the site. Clondalkin Town Centre is situated approximately 1 km to the south of the site. Clondalkin/Fonthill Train Station is situated approximately 800 metres to the north-west of the site whilst Park West and Cherry Orchard train station is situated approximately 950 metres to the north east of the site. Clondalkin Leisure centre is situated approximately 1.2 km to the south west of the site.

5.3.2.3 Schools

The nearest schools and education centres to the site are St Peters the Apostle Junior National School, Our Lady Queen of Apostles, Gaelscoil na Camoige, Rowtrees pre-school and The Yes Centre, Clondalkin. These schools and education centres are all situated less than 1 km from the site.

5.3.2.1 Commercial Enterprise

The site is situated within the Clondalkin Industrial Estate and is immediately surrounded by commercial and industrial premises. Weatherwell Business Park is situated directly west of the site opposite Station Road. Cloverhill Industrial estate is situated directly north of the site the other side of the Dublin to Cork Railway Line. Park West Business Park is situated approximately 1 km east of the site the other side of the M50 motorway.

Hammond Land Metal Processing facility is situated in Clondalkin Industrial Estate 290 metres south east of the site. The facility has a Waste Facility permit with South Dublin County Council (Permit Ref: WFP-DS-14-0012-02).

Greyhound Household Recycling's Waste Management Centre is situated in Clondalkin industrial Estate approximately 450 metres east of the site. This facility has a Waste Licence with the EPA (Licence Ref: W0205-01)

Tender Meats Meat Processing facility is situated 400 metres to the south east of the site.

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5.3.3 Tourism and Recreational Amenity

The Grand Canal Greenway is situated approximately 300 metre to the south of the site. A walkway runs along its southern stretch which is in regular use. This constitutes a local amenity. The Grand Canal constitutes a part of the County's Green Infrastructure Network. It is the policy of South Dublin County Council to promote the Grand Canal as a key component of the County's Green Infrastructure network and to protect and enhance the visual, recreational, environmental, ecological, industrial heritage and amenity value of the Grand Canal (pNHA) and its towpaths, adjacent wetlands and associated habitats.

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Other amenities in the broader area include Clondalkin Round Tower just south of Clondalkin Town Centre, The Camac River which is approximately 750 metres south west of the site at its nearest point and Collinstown Park which is situated approximately 780 metres north of the site.

The site lies within a landscape characterized as urban in SDCC's Landscape Character Assessment. The site does not lie within any identified sensitive Landscape Character Area. No views or prospects that are identified for protection or preservation in the County Development Plan are situated in the local area in which the site is located.

5.3.4 Population

The smallest geographical unit distinguished by the CSO in the Republic of Ireland is the Electoral Division. The site lies within the Clondalkin Moorfield Electoral Division. A summary of national, regional and local population data and trends is shown in the table below

Table 5-1 Population Trends

Jurisdiction	2011	2016	Change 2006 – 2011 %
State	4,588,252	4,761,865	3.78%
Dublin City and Suburbs	1,110,627	1,173,179	5.63%
South County Dublin	265,205	278,749	5.11%
Clondalkin	45,012	46,813	4.00%
Clondalkin Moorfield	6,251	6,313	0.99%

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It is noted that there has been a relatively small level of population growth in the local area and that population growth in the electoral division in which the site is situated has been slower than population growth in Clondalkin and the wider region.

A number of greenfield and brownfield sites in the local and wider area are zoned Objective RES - To protect and/or improve residential amenity, under South Dublin County Council's Development Plan. Given the current demand for housing in the region at the time of writing, there is a significant possibility that housing will be built on this land in the near future. Consequently, it can be expected that population within the Clondalkin Moorfield Electoral Division will increase.

5.3.5 Employment

The number of people on the Live Register in County Dublin is 47,122 as of April 2019. This is down from 55,001 in April 2018 and 64,348 in April 2017. This figure is still not as it was in April 2006, prior to the recession, when the figure was 40,280.

A breakdown of employment for the electoral division and county is shown in the table below. Most people in Clondalkin Moorfield are employed in commerce and trade and Professional Services, with significant numbers employed in manufacturing and transport and communications. Proportionally, this aligns with the breakdown employment by sector in South Dublin generally.

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Table 5-2 Employment by Sector

Sector	Clondalkin Moorfield		South Dublin	
Agriculture, forestry and fishing	2	0.08%	236	0.20%
Building and construction	129	5.37%	6,084	5.10%
Manufacturing industries	212	8.82%	10,494	8.80%
Commerce and trade	595	24.75%	33,303	27.94%
Transport and communications	270	11.23%	12,600	10.57%
Public administration	102	4.24%	6,931	5.81%
Professional services	528	21.96%	27,565	23.12%
Other	566	23.54%	21,997	18.45%
Total	2,404		119,210	

5.4 Impact Assessment

5.4.1 Construction Impacts

5.4.1.1 Population

Construction activities associated with the dual flow proposal will have a negligible impact on population trends given the duration and scale of the proposed construction works.

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5.4.1.2 Employment

The construction works associated with the dual flow proposal will result in the requirement for a number of construction workers across all skill levels for the duration of the works.

5.4.1.3 Residential Amenity

The construction of the dual flow drainage system on-site will involve some concrete breaking, excavation works and construction works. It is expected that such construction activities will give rise to some levels of noise and dust emissions. Given that construction activities will be limited in scale and duration, temporary and intermittent in nature and given construction works will be taking place at a location on-site that is a considerable distance away from any sensitive receptor, it is not anticipated they will give rise to significant noise and dust impacts upon sensitive receptors. In addition, construction operations shall only be carried out during designated construction operating hours, which are proposed to be as follows:

- Monday to Friday: 8 a.m. to 7 p.m.
- Saturdays: 8 a.m. to 2 p.m.

Concrete breaking may be give rise to local ground borne vibration, but this is unlikely to be of nuisance given the considerable distance to any sensitive receptor, and is unlikely to result in cosmetic or structural damage to buildings.

As is typical for a construction project such as this, it is anticipated there will be a small number of truck movements associated with the construction works. This is determined to be negligible in terms of noise impact and impact upon local roads.

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It is not anticipated that the construction works will not have any significant visual impact upon sensitive receptors as views onto the site from surrounding residential receptors are fully blocked. Hoarding will also be placed around the construction area.

5.4.1.4 Health and Safety

The health and safety of human beings may be impacted during the construction phase. In addition to noise, dust and traffic, there is the potential risk of on-site plant and equipment having a mechanical or electrical fault and causing a fire. Risk to human health and well-being will be reduced through safety inspections and the implementation of safe operating procedures during construction. All construction staff will be suitably trained in order to ensure safe operations.

Construction phase activities are subject to Safety, Health and Welfare at Work (Construction) Regulations. Under this legislation all risks associated with construction processes will be identified and minimized during a Project Supervisor Design Phase and Project Supervisor Construction Stage.

5.4.1.5 Tourism and Recreational Amenity

There will be no direct impact on tourism or recreational amenity as a result of the proposed construction works associated with the dual flow proposal given the nature, scale, duration and location of construction works and the lack of any recreational amenities in the vicinity of the site.

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5.4.1.6 Visual Effects

The construction activities on-site are anticipated to give rise to temporary short term slight negative visual impacts upon commercial premises in close proximity to the site. It is not anticipated that the construction works will have any visual impact upon sensitive receptors as views onto the site from surrounding residential receptors are fully blocked. Hoarding will also be placed around the construction area.

5.4.2 Operational Impacts

5.4.2.1 Population

There will be no significant increase in employment levels or population in the local area as a result of the continuation of production and ancillary activities at the facility.

5.4.2.2 Employment

The facility currently employs 25 personnel. These jobs will be secured in the event production and ancillary activities continue at the facility under a revised Industrial Emissions licence.

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5.4.2.3 Residential Amenity

It is anticipated the proposed activity will have no significant impact upon residential amenity in the local area.

The Noise Impact Assessment, shown in Section 10, has determined that noise emanating from site activities has no significant impact on noise sensitive receptors in the local environment.

The Air and Climate Impact Assessment, shown in Section 9, has determined that stack emissions from smelting and refining processes on-site will not cause any reduction in local, ambient air quality. Fugitive lead dust emissions associated with production processes will be minimized and controlled through the adoption of various mitigation measures, as defined in the Air and Climate Chapter.

5.4.2.4 Health and Safety

As discussed in Section 5.4.1.3, it has been determined that noise, stack and dust emissions emanating from the site will be minimized and controlled in manner that will ensure there are no adverse impacts upon human health, safety or well-being.

Potential exists for the occurrence of a fire on-site. A fire may occur on-site due to the malfunction of a Melting Kettle (e.g. overheating) or Gas Burner (e.g. gas leak) on-site, or due to the accidental ignition of flammable substances present on-site. The occurrence of a major fire on-site may lead to a temporary reduction in local, ambient air quality through the release of high levels of particulates and combustion gases, however it is considered that the risk of such an occurrence is extremely low considering the fire safety control measures, material storage protocols and mitigation measures in place at the facility, as well as the low volumes of flammable material present on-site. A major fire on-site may cause a temporary, significant impact upon local air quality, however the likelihood of a major fire occurring on-site is extremely low given measures in place for preventing such an incident.

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The applicant has a Health and Safety Management System accredited to OHSAS18001 and have developed procedures to control environmental, fire and health and safety hazards on-site and for preventing and responding to emergency situations.

5.4.2.5 Tourism and Recreational Amenity

As discussed in Section 5.4.2.3, it has been determined that noise and air emissions emanating from the site will be minimized and controlled in manner that will ensure there are no significant, adverse effects on the Grand Canal Greenway 300 metres to the south of the site or any other amenity area in the wider area. It is expected that noise from the site will not be discernible at this location due to how noise is minimized and controlled on-site, and due to the presence of intervening, more dominant noise sources and road traffic on the nearby Ninth Lock Road.

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5.4.2.6 Visual Effects

As the facility in question is already in existence and as the facility is situated within a well-established urban industrial area it has been determined that there will be no perceptible impact upon visual amenity in the vicinity of the site or wider area. For further information on this please see the Landscape and Visual Impact Assessment undertaken in Section 13.

5.5 Mitigation Measures

5.5.1 Construction Phase Mitigation Measures

Mitigation measures to reduce noise impacts during the construction phase are detailed in Section 10.5.1. Mitigation measures to reduce dust impacts during the construction phase are detailed in Section 9.5.1. Mitigation measures to reduce visual impacts upon the receiving environment are dealt with in Section 13.5.

5.5.2 Operational Phase Mitigation Measures

Mitigation measures to prevent noise emanating from the facility having a significant adverse impact upon any existing or potential sensitive receptors are detailed in Section 10.5.2

Mitigation measures to prevent and reduce emissions to air from the smelting/refining process causing a deterioration of local ambient air quality are detailed in Section 9.5.2.

The following Mitigation Measures will be in place at the facility for preventing and adequately responding to accidents and incidents on-site that may have an impact upon off-site receptors:

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- A Health and Safety Management System for the facility will be maintained to ensure the proactive management and control of hazards and risk on-site and the prevention and adequate response to accidents or incidents that have the potential to have off-site effects. The H&SMS is based on principles of risk management and continual improvement. This H&SMS is currently accredited to ISO18007: 2007. It is proposed to transition the H&SMS to ISO's new Occupational Health & Safety standard ISO 45001 in the coming years.
- An Environmental, Health and Safety Manager has been designated and is responsible for the implementation of the H&SMS
- A programme of inspection and preventative maintenance for equipment that poses a risk such as gas burners and melting kettles has been established.
- Standard Operating Procedures to ensure the effective and safe operation and control of processes have been established for working activities at the facility that pose risk.
- An Emergency Preparedness and Response Procedure has been established for managing and controlling emergency situations at the facility that may pose off-site risks. Fire drills are carried out every 6 months. The emergency preparedness and response procedure is reviewed at a minimum every 12 months. Training in the Emergency Preparedness and Response procedure is provided to all employees.
- Diesel is stored in a bunded diesel fuel storage tank away in the yard area away from heat sources.
- Sodium hydroxide, Calcium hydroxide and Sodium nitrate (which poses an explosive hazard) are stored in a cool, dry place in a segregated, contained storage area in

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Building D and are protected from heat sources and mechanical impact. Sodium nitrate is stored in accordance with national explosives legislation. The facility is a licensed factory/magazine with the Department of Justice under this legislation.

5.6 Residual Impacts

With the adoption of the above mitigation measures, it is anticipated there will be no likely, significant direct or indirect impacts upon Population or Human Health expected as a result of the proposed activity occurring at the site in question.

5.6.1 Cumulative Impacts

The facility is situated in a well-established and well serviced industrial area and is surrounded on all sides by other commercial and industrial premises. No other significant existing or proposed development have been identified in the area which would result in a significant cumulative impact on population and human health.

5.6.2 Indirect Impacts

The potential deterioration of water quality in receiving water bodies as a result of construction or operational phase activities could result in indirect in adverse impacts on the aquatic ecology of the water bodies and consequently amenity value for people associated with such. The Water Chapter of the EIAR (Section 8) concludes that the proposed activity will have no significant adverse impact on receiving water bodies given mitigation measures in place, in particular the proposal to redirect 'first flush' stormwater to foul sewer.

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It is anticipated that the development of the Dual Flow Drainage System will have a slight to moderate positive impact on water quality in receiving water bodies and therefore potentially a positive impact on receiving water body ecology and amenity value.

Noise and Dust generated during the construction phase could potentially affect local population and human health. The deterioration of air quality as a result of stack emission and fugitive emissions associated with the proposed operational phase activity has the potential have an impact on property and human health and well-being in the locality. Noise emanating from the site during the operational phase could also potentially impact property and human health and well-being locally. Given construction phase and operational phase mitigation measures in place in relation to the control of air, dust and noise emissions, it is not anticipated that will be any discernible adverse impacts on human health or well-being.

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6. Biodiversity

6.1 Introduction

This chapter of the EIAR describes the baseline ecology of the receiving environment at the applicant's site, assesses the potential impacts of the proposed activity upon ecology and, where necessary, recommends measures to minimize such impacts.

Environmental Efficiency Consultants were commissioned by the applicant to prepare this chapter. As there are no plans to materially change the size or layout of the facility or processes on-site, and given the site is located in area that is industrial in character, a desk top study involving a review of published information on local ecology and a walkover survey of the site and surrounding areas carried out by a suitably experienced Senior Environmental/Planning Consultant were deemed appropriate for evaluating the baseline ecological environment and assessing the ecological impacts of the proposed activity.

6.2 Assessment Methodology

The assessment of impacts of the proposed activity upon ecology and biodiversity consisted of the completion of the following steps:

1. Desk Study
2. Site Walkover Survey
3. Ecological Impact Assessment

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6.2.1 Desk Study

The desk study involved conducting a review of ecological and designated area data held by the National Parks and Wildlife Services and Biodiversity Ireland. In addition, the following sources were looked at to determine the characteristics of the site and surrounding environment from an ecological perspective.

- Ordnance Survey Ireland Mapping
- Aerial Photography
- An Ecological Survey of the Grand and Royal Canals in Dublin, Ecoserve, prepared for Waterways Ireland (2011)
- 'Flora and Fauna' Chapter of an 'Environmental Impact Statement' for the nearby Hammond Lane facility completed in 2013.

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6.2.2 Site Survey

A walkover survey of the site, the site boundary and the surrounding area took place, with a focus on areas of potential ecological interest including the Grand Canal and the Gallanstown Stream situated to the south of the site. The purpose of the survey was to identify and characterize habitats in the area surrounding the site and develop an understanding of the ecological value of these habitats. This survey was carried out having regard to the following Guidance Documents:

- Heritage Council's *Best Practice Guidance for Habitat Survey and Mapping* (2010).
- Heritage Council's *A Guide to Habitats in Ireland* (2000).

6.2.3 Ecological Impact Assessment

The Ecological Impact Assessment was carried out having regard to Chartered Institute of Ecology and Environmental Management's *Guidelines for Ecological Impact Assessment in the UK and Ireland* (2016) and the EPA's Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Draft), 2017, and consisted of the following stages:

1. Determine the importance of ecological features affected, through desk top research and walkover survey;
2. Assess impacts potentially affecting important features;
3. Characterise the impacts by describing their extent, magnitude, duration, reversibility, timing and frequency;
4. Identify cumulative impacts; and
5. Identify significant effects of impacts in the absence of any mitigation.

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In order to evaluate the ecological value of habitats on-site and surrounding the site Transport Infrastructure of Ireland's (formerly the 'National Roads Authority)' criteria for valuing ecological resources as defined in their Guidelines for Assessment of Ecological Impacts of National Roads Schemes was referred to (outlined in Table 6-1 below)

In order to describe ecological effects and assess the significance of impacts the EPA's guidance on Describing Effects and Impact Assessment Criteria contained in Sections 3.7.3 and 3.7.4, respectively, of their document 'Guidelines on Information to be contained in Environmental Impact Assessment Reports'(2017), and outlined in Section 1.8 of this document, was referred to.

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Table 6-1 Criteria for Valuing Ecological Resources (Transport Infrastructure of Ireland)

Ecological Valuation
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. • 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. • 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)5 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).
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) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. • Site containing 'viable areas' of the habitat types listed in Annex I
County Importance: • Area of Special Amenity. • 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) 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

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Ecological Valuation
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, 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) 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.

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6.3 Baseline Environment

6.3.1 Site Description

The facility is situated at Station Road in the townland of Ballymanaggin, Clondalkin, South County Dublin. It is approximately 1.85 hectares in size. The site consists of a number of administrative, production and warehouse buildings surrounded by large areas of concrete yard. It is situated in Clondalkin Industrial Estate in what can be described as a well-established industrial area and is surrounded on all sides by commercial and industrial premises.

Sections of scrub border the north of the site (running along the Dublin to Cork railway line) and can be found in pockets in areas north west of the site opposite the train line and south of the site around Ballymanaggin Lane and near to and bordering the Grand Canal greenway. Recolonizing bare ground can be found on a disused brownfield site to the north west of the site. A landscaped treeline runs along the southern border of the site. The surrounding area predominantly consists of the local built environment however.

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The Grand Canal Greenway running in a west-east direction is situated approximately 300 metres south of the site. The Gallanstown Stream, which runs alongside the canal is situated approximately 280 metres to the south of the site and the River Camac, which the Gallanstown eventually flows into, is situated approximately 760 metres to the south-east of the site.

6.3.2 Designated Conservation Areas

The site is not located within or adjoining any designated conservation areas. The nearest designated area is the Grand Canal proposed Natural Heritage Area (pNHA), which is situated 300 metres to the south of the site.

Special Areas of Conservation (SAC's), Special Protection Areas (SPA's) and proposed Natural Heritage Areas (pNHA's) situated within 15 km of the site are detailed in Table 6-2 below and shown in the Figure 6-1, Figure 6-2 and Figure 6-3 below.

Table 6-2 Designated Areas within 15 km of the site

Site Name and code	Distance and direction to the site
Special Areas of Conservation (SACs)	
Rye Water Valley/Carton (001398)	7.1 km NW
North Dublin Bay SAC (000206)	14.7 km E
South Dublin Bay (00210)	12.0 km E
Wicklow Mountains (002122)	11.8 km SE
Glensamole Valley (001209)	8.2 km SE
Special Protection Areas (SPAs)	
South Dublin bay and Tolka Estuary (004024)	12.0 km NE
North Bull Island (004006)	14.7 km NE
Wicklow Mountains (004040)	13 km SE
Proposed Natural Heritage Areas (pNHAs)	
Grand Canal (001398)	0.3 km S
Lugmore Glen (001212)	8.2 km S
Liffey Valley (000128)	3.3 km NE
Royal Canal (002103)	6.2 km N
South Dublin Bay (000210)	12.0 km E
Dodder Valley (000991)	6.5 km SE
Glensamole Valley (001209)	8.2 km SE
Slade of Saggart and Crooksink (000211)	8.6 km SW
Booterstown Marsh (001205)	13.3 km E
Fitzsimmons Woods (001753)	12.3 km SE
Rye Valley/ Carton (001398)	7.1 km NW
North Dublin Bay (000206)	14.7 km E
Santry Demesne (000178)	11.8 km NE

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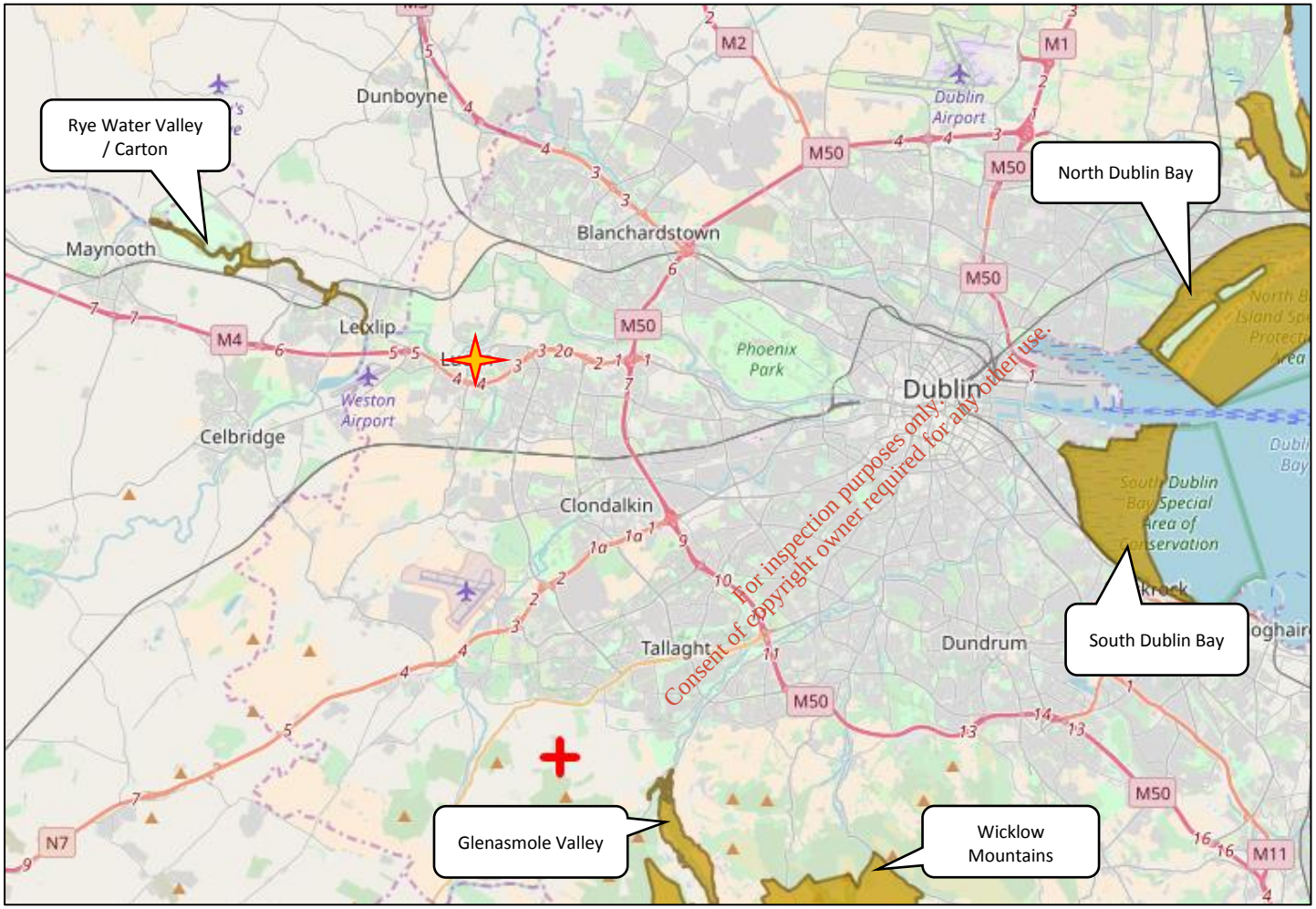

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Figure 6-1 SACs within 15 km of the site

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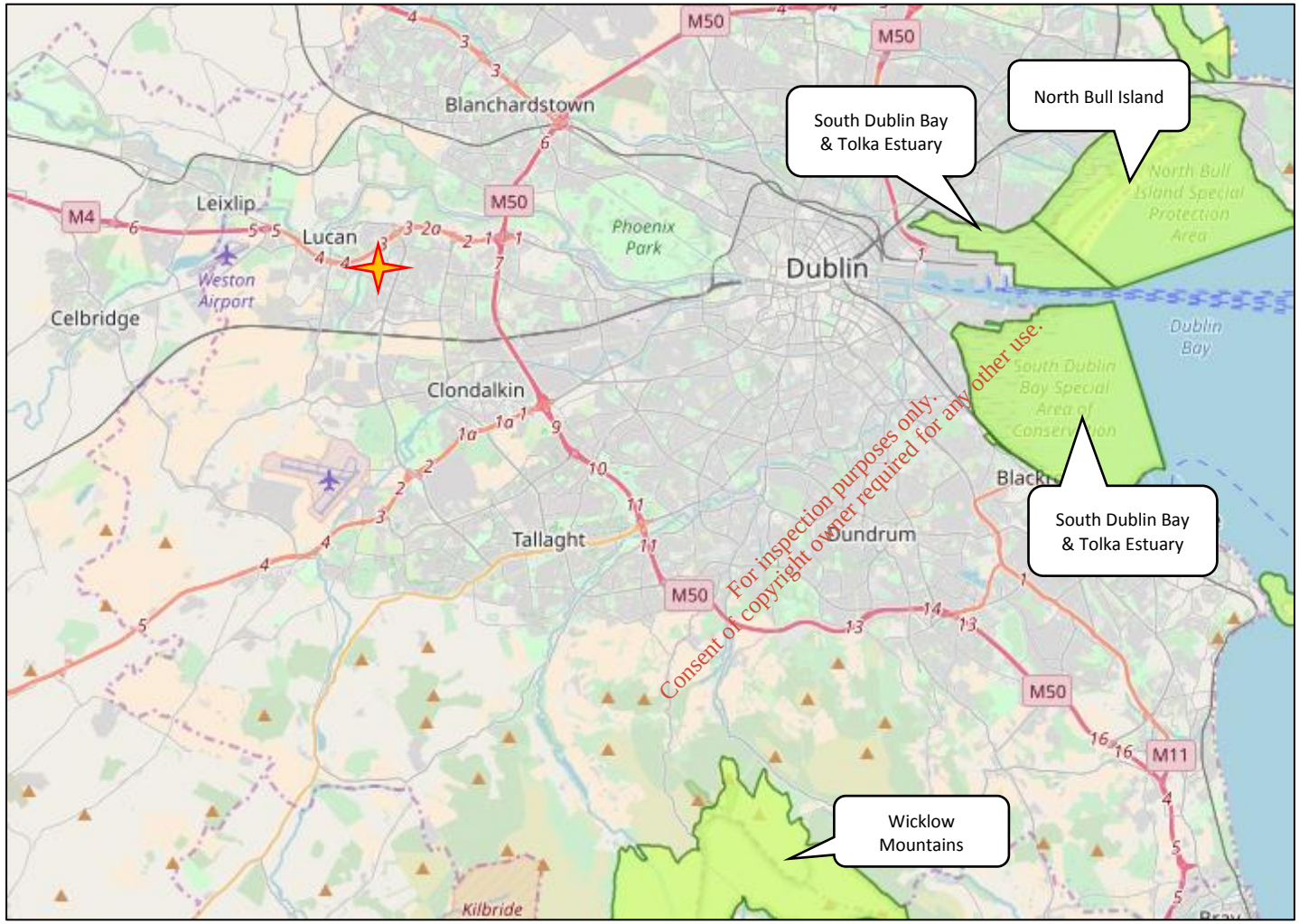

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Figure 6-2 SPAs within 15 km of the site

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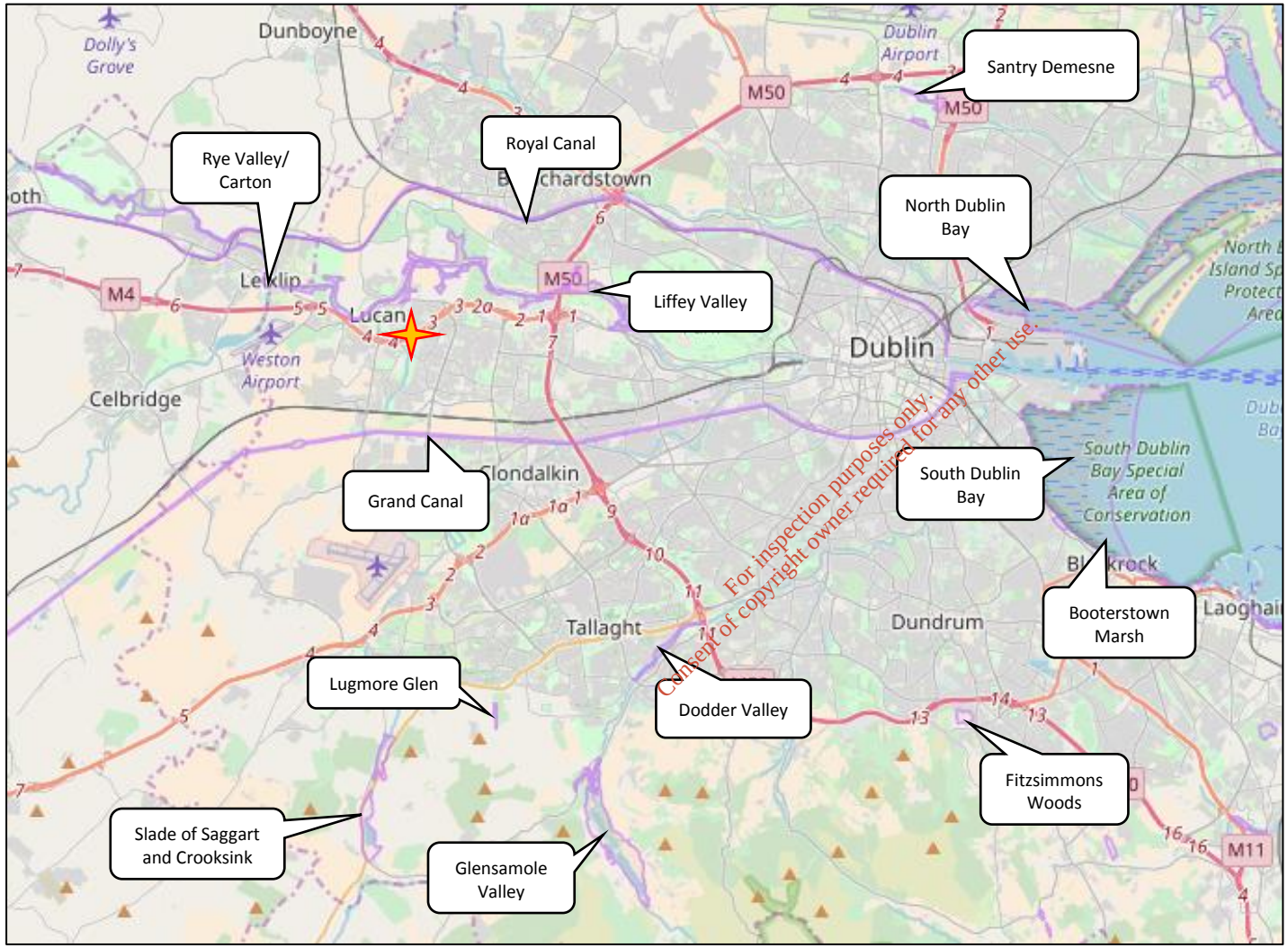

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Figure 6-3 pNHAs within 15 km of the site

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6.3.3 Habitats and Species

6.3.3.1 Habitats occurring on-site and in surrounding areas

All habitats occurring within or adjacent to the site or within the local area surrounding the site have been defined in accordance with the Heritage Council's *A Guide to Habitats in Ireland* (2000) and are shown in Figure 6-4 below.

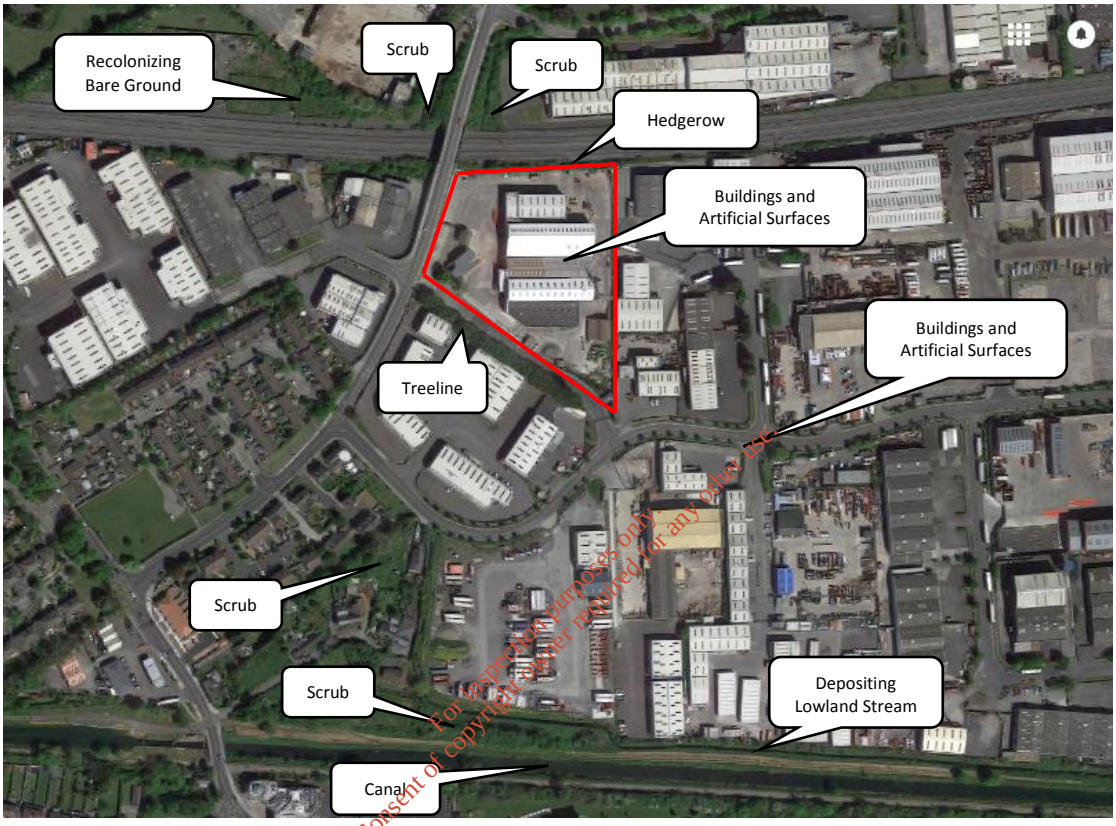

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Figure 6-4 Site and Local Area Habitat Map

Buildings and Artificial Surfaces (BL3)

The site and most of the surrounding area is distinctly urban in character and consists of industrial, commercial and residential land uses. As such Buildings and Artificial Surfaces (BL3) are the dominant habitat type in the local area. These are have low ecological value.

Hedgerows (WL1)

The site is bordered to the north by the Dublin to Cork Railway Line. A linear hedgerow runs along the site border to the north separating the site from the railway line. Hedgerows commonly support a high proportion of spinose plants such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Gorse (*Ulex europaeus*), Holly (*Ilex aquifolium*), Dog-rose (*Rosa canina*) or Bramble (*Rubus fruticosus agg.),* in addition to many other native and non-native trees and shrubs including, for example, Ash (Fraxinus excelsior), Hazel (*Corylus avellana*), Beech (*Fagus sylvatica*), Elder (*Sambucus nigra*), elms (*Ulmus spp.*) and willows (*Salix spp.*). Some of these may occur as scattered tall trees. Fuchsia (*Fuchsia magellanica*), an introduced shrub, is a common component of hedgerows in parts of the south and west of Ireland. Hedgerows frequently support climbing plants such as Ivy (*Hedera helix*), Honeysuckle (*Lonicera periclymenum*), Hedge Bindweed (*Calystegia sepium*), Cleavers (*Galium aparine*) and

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Bush Vetch (*Vicia sepium*). Tall grasses, including False Brome (*Brachypodium sylvaticum*) and Hairy-brome (*Bromopsis ramosa*), ferns, and woodland herbs are characteristic.

Scrub (WS1)

Areas of Scrub are situated in disused areas surrounding the site to the north west, south and south east of the site. Common components include spinose plants such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Gorse (*Ulex europaeus*), Juniper (*Juniperus communis*), Bramble (*Rubus fruticosus agg.)* and erect or scrambling roses (*Rosa spp.),* in addition to a number of willows (*Salix spp.),* small birches (*Betula spp.)* and stunted Hazel (*Corylus avellana*). Scrub may also contain Bog-myrtle (Myrica gale) and Broom (*Cytisus scoparius*).

Tree Line (WL2)

A well landscaped treeline runs along the southern border of the site and separates the site with commercial premises directly south.

Recolonizing Bare Ground (ED3)

An area of Recolonizing Bare Ground exists to the north west of the site. This area comprises a derelict site that would have previously been used as railway station in the mid 19th century. This area is dominated by herbaceous plants. Common examples of Flora species found in these locations in Ireland include Colt's Foot (*Tussilago farfara*), Nettle (*Urtica dioica*), Dandelion (*Taraxacum spp.),* willow-herbs 63 (*Epilobium spp.)* and ragworts (*Senecio spp.).* In urban areas, recolonising bare ground can be important for wildlife and may support a diverse flora, typically with a high proportion of non-native species, including Butterfly-bush (*Buddleja davidii*), Japanese Knotweed (*Reynoutria japonica*) and many other garden escapes.

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Depositing/Lowland Stream (FW2)

The Gallanstown Stream is situated 280 metres to the south of the site. This is a small stream that could be more aptly characterized as a drainage ditch due to its low flow rate. It is likely that the water quality of the stream is negatively affected by run-off from surrounding urban areas.

Canal (FW3)

The Grand Canal is situated approximately 300 metres to the south of the site. It is separated from the site by a number of roads and buildings. It is the only designated area in close proximity to the site. The Grand Canal pNHA supports a number of different habitats such as hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland.

The canal is fringed along its banks by established tall reed and herb marginal vegetation. An established treeline occurs either side of the canal. Scrub habitat occurs between the canal and the Gallanstown Stream south of the site. A tow-path with a grass verge runs along the southern bank of the canal south of the site.

Canals in Ireland are readily colonised by aquatic plants and frequently support floating, submerged or emergent vegetation. Typical aquatics include water-milfoils (*Myriophyllum spp.),* water-lilies (*Nuphar lutea, Nymphaea alba*), Amphibious Bistort (*Polygonum amphibium*), bur-reeds (*Sparganium spp.),* duckweeds (*Lemna spp.),* Canadian pondweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*), rigid hornwort (*Ceratophyllum demersum*), common reed (*Phragmites australis*), reed sweet-grass (Glyceria maxima), yellow iris (*Iris pseudacorus*), yellow water-lily (Nuphar lutea), branched bur-reed (*Sparganium erectum*) and common club-rush (*Schoenoplectus lacustris*).

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The diversity of species along the section of the canal south of the site from the Ninth Lock to the M50 motorway is quite high with Arrowhead (*Sagittaria sagiltifolia*), Hemlock water dropworth (*Oenanthe crocata*) and Watercress (*Nasturtium officinale*) being more common here than along other stretches of the canal. The protected opposite-leaved pondweed (*Groenlandia densa*) has also been recorded here.

It is noted that the canal is an important ecological corridor in the region which can support the movement of fauna.

6.3.3.2 Terrestrial Fauna

Species that may be present within the local area generally include the field mouse (*Apodemus sylvaticus*), pygmy shrew (*Sorex minutus*), red and grey squirrel (*Sciurus vulgaris and S. carolinensis*), rabbit (*Oryctolagus cuniculus*), hedgehog (*Erinaceus europaeus*) and fox (*Vulpes vulpes*).

There are no habitats on-site or in the vicinity of the site that are suitable for notable protected fauna species such as badgers and burrowing species, otters or reptiles and amphibians.

A review of the National Bat Database of Ireland held by the National Biodiversity Data Centre has shown that there are no records of bat roosts or bat activity on-site or within close proximity of the site. The Grand Canal provides both roosting and feeding opportunities for bats. Many species of flies and midges have aquatic larvae, therefore foraging opportunities for bats in the vicinity of the canal are good. Hedgerows and treelines present along some sections of the canal provide transit routes for bats from more distant roosts to the canal.

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A variety of protected bird species have been recorded in the surrounding region however the site nor its environs are deemed suitable habitats for roosting, feeding or breeding.

Again, there are no habitats on or adjacent to the site that are deemed particularly suited to the presence of invertebrates. As such, it is likely that the abundance and diversity of invertebrates is limited and only more common invertebrates may be found in the environs of the site.

6.3.3.3 Aquatic Fauna

There are no aquatic habitats on or adjacent to the site. The Grand Canal is situated 300 metres to the south of the site at its nearest point. It is separated by a number of roadways and buildings from the site. The Gallanstown stream is situated 270 metres to the south of the site. This eventually runs into the River Camac at Bluebell, east the M50 motorway.

Notable aquatic fauna that have been recorded along the Grand Canal include salmonid and cyprinid fish species, Otters, White Clawed Crayfish, the *Vertigo moulinsiana* and *Myxas glutinosa* snails. Otters have been recorded in the stretch of the canal between Ninth Lock Bridge and the M50 to the south of the site.

Vertigo moulinsiana and Myxas glutinosa snails have been recorded along the Grand Canal within 1 km of the site.

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The canal also supports a range of waterbirds and a range of duck species. The most frequently recorded species was the Feral Pigeon (*Columba livia*), followed by Moorhen (*Gallinula chloropus),* Black-headed Gull (*Chroicocephalus ridibundus*), Mallard (*Anas platyrhynchos*) and Magpie (Pica pica). Water-dependent birds such as the Moorhen, Mallard and Mute Swan (Cygnus olor) are clearly the species that are most intimately linked with the canal itself and its habitats, depending on it for feeding, roosting, nesting and rearing their young.

The Gallanstown Stream is likely to have potential to support similar species as described above, however its ecological potential is likely to be much reduced due to pressures and impacts on the stream affecting water quality caused by urban run-off.

6.3.3.4 Rare and Protected Species

Records of Rare and Protected species situated within the vicinity of the site were identified using NPWS and National Biodiversity Data Centre data sources.

The Rare and Protected plant Opposite-leaved Pondweed (*Groenlandia densa*) is known to occur along the Grand Canal south of the site, namely within the 1 km grid unit 00732.

Otters have been record along stretches of the Grand Canal south of the site as well as upstream and downstream of the site.

A range of bat species have also been recorded foraging along the stretch of the Grand Canal situated to the south of the site.

Rare and Protected Fauna within the 2km grid unit 003R in which the site is located are detailed in the Table 6-3 below.[2]

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[2] A full list of Rare and Protected Fauna found within the 10 km grid unit 003 can be found via National Biodiversity Data Centre Records. These records are deemed too lengthy to include in this EIAR.

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Table 6-3 Record of Rare and Protected Fauna Species within 2 km Grid Unit 003R (National Biodiversity Data Centre)

Species Name	Legal Status
Common Kestrel (Falco tinnunculus)	• Protected Species: Wildlife Acts • Threatened Species: Birds of Conservation - Amber List
Common Starling (*Sturnus vulgaris*)	• Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Wood Pigeon (*Columba palumbus*)	• Protected Species: Wildlife Acts • Protected Species: EU Birds Directive
Herring Gull (*Larus argentatus*)	• Protected Species: Wildlife Acts • Threatened Species: Birds of Conservation Concern - Red List
House Sparrow (*Passer domesticus*)	• Protected Species: Wildlife Acts • Threatened Species: Birds of Conservation Concern - Amber List
Mallard (*Anas platyrhynchos*)	• Protected Species: Wildlife Acts • Protected Species: EU Birds Directive
Mute Swan (*Cygnus olor*)	• Protected Species: Wildlife Acts • Threatened Species: Birds of Conservation Concern - Amber List
Rock Pigeon (*Columba livia*)	• Protected Species: Wildlife Acts • Protected Species: EU Birds Directive
Tufted Duck (*Aythya fuligula*)	• Protected Species: Wildlife Acts • Protected Species: EU Birds Directive • Threatened Species: Birds of Conservation Concern - Amber List
Daubenton's Bat (M*yotis daubentonii*)	• Protected Species: EU Habitats Directive • Protected Species: Wildlife Acts
European Otter (*Lutra lutra*)	• Protected Species: EU Habitats Directive • Protected Species: Wildlife Acts
Lesser Noctule (*Nyctalus leisleri*)	• Protected Species: EU Habitats Directive • Protected Species: Wildlife Acts
Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	• Protected Species: EU Habitats Directive • Protected Species: Wildlife Acts
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	• Protected Species: EU Habitats Directive • Protected Species: Wildlife Acts
West European Hedgehog (*Erinaceus europaeus*)	• Protected Species: Wildlife Acts
Common Kestrel (*Falco tinnunculus*)	• Protected Species: Wildlife Acts • Threatened Species: Birds of Conservation Concern - Amber List
Common Starling (*Sturnus vulgaris*)	• Protected Species: Wildlife Acts • Threatened Species: Birds of Conservation Concern - Amber List

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Rare and Protected Flora Species within the 10 km grid unit in which the site is located is shown in the Table 6-4 below.

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Table 6-4 National Record of Rare and Protected Flora Species within 10 km Grid Unit 003 (National Biodiversity Data Centre)

Species Name	Legal Status
Red Hemp Nettle (Galeopsis angustfolia)	• Protected Species: Wildlife Acts
Meadow Barley (Hordeum secalinum)	• Protected Species: Wildlife Acts
Hairy Violet (Viola hirta)	• Protected Species: Wildlife Acts
Hairy St. John's Wort (Hypericum hirsutum)	• Protected Species: Wildlife Acts
Basil Thyme (Acino arvensis)	• Protected Species: Wildlife Acts
Opposite-leaved Pondweed (Groenlandia densa)	• Protected Species: Wildlife Acts
Betony (Stachys officinalis)	• Protected Species: Wildlife Acts

6.3.4 Site Evaluation

An evaluation of habits on-site and in the local area took place with reference to the Transport Infrastructure of Ireland's (formerly the 'National Roads Authority)' criteria for valuing ecological resources as defined in their Guidelines for Assessment of Ecological Impacts of National Roads Schemes.

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The site and surrounding commercial and industrial area consist of habitats defined as Buildings and Artificial Surfaces in Fossitt's '*A Guide to Habitats in Ireland*' (2000) and, as such, are deemed to be areas of low ecological value and conservation importance (Classification E).

Hedgerows, scrub, treelines and recolonizing bare ground surrounding the site are all deemed to be habitats of low ecological value (Classification E). These are semi-natural habitats of some local importance for wildlife.

The Grand Canal to the south of the site is the only example of a habitat of significant ecological value in the wider area surrounding the site. An Ecological Survey prepared for Waterways by Ecoserve in 2011 An Ecological Survey of the Grand and Royal Canals in Dublin, Ecoserve, prepared for Waterways Ireland (2011)), concluded that the Grand Canal is an important refuge for wildlife. As discussed, the Grand Canal supports a wide variety of flora and fauna species. The Grand Canal is also a designated pNHA. As such the Grand Canal and associated habitats are classed as habitats of National Importance (Classification B).

The Gallanstown Stream, which runs adjacent to the Grand Canal is an area that may contain a high level of biodiversity in a local context. As such, the stream and associated habitats are classed as having Local Importance (Classification D).

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6.4 Impact Assessment

6.4.1 Construction Phase Impacts

Give the limited scale, and temporary nature of construction works, given that construction works do not require any vegetative stripping and given that such works are taking place at a site based in an industrial estate and a considerable distance away from any area that may be considered to be ecological interest, it is not anticipated construction activities will have any impact upon flora or fauna.

6.4.2 Operational Phase Impacts

6.4.2.1 Impacts upon Habitats and Species in the surrounding area

6.4.2.1.1 Impacts upon Terrestrial Habitats and Species

The proposed activity has the potential to have impacts upon localized terrestrial habitats and species due to fugitive dust emissions and noise emissions.

The impacts of operational noise at the facility have been detailed in Section 10 of the EIAR. It has been determined that noise emanating from the facility will have no significant impact upon the surrounding environment.

Fugitive dust arises on-site due to the storage, handling and processing of lead. An assessment of fugitive dust emissions detailed in Section 9 of the EIAR has concluded that fugitive dust impacts will not be significant given mitigation measures in place on-site.

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It is noted that the habitats of significant ecological value do not occur on or adjacent to the site. The Gallanstown Stream (local importance) is situated 280 metres to the south of the site. The Grand Canal (national importance) occurs 300 metres to the south of the site. The site and these water bodies are separated by a number of roads and buildings. In addition, there is no hydrological pathway between the site and the Grand Canal. No other habitats of significant ecological value occur within the local area.

It has been determined that emissions to air from smelting/refining processes at emission point AE-1 (baghouse filter exhaust), which could potentially have an impact on local ecology, will have an imperceptible impact upon local ambient air quality (See Air Dispersion Modelling referred to in Section 9).

6.4.2.1.2 Impacts upon Aquatic Habitats and Species

The proposed activity has the potential to have an impact upon aquatic eco-systems and fauna due to aqueous emissions. Activities that have the potential to impact upon receiving surface waters include:

- Stormwater run-off containing elevated levels of pollutants
- Spills and leaks of hazardous materials (e.g. diesel and oils)
- Firewater run-off

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Stormwater Emissions

There is no trade effluent associated with facility operations. Stormwater generated on-site emanating from non-process areas can contain elevated levels of lead however. This lead originates from fugitive dust emissions associated with storage, processing and handling of lead on-site. Fugitive lead dust makes its way from indoor storage and processing areas to the concrete yard area outdoors where it settles. From there it can become entrained in stormwater run-off. This stormwater may have a detrimental impact on the aquatic ecology of downstream, receiving surface waters.

Under the Dual Flow Proposal, 'first flush' stormwater, containing elevated lead concentrations, will be discharged to a retention tank before gradually draining to foul sewer. 'First flush' stormwater run-off which is directed to foul sewer will be treated at the Ringsend WWTP before being discharged to the environment. During a prolonged or intense rainfall stormwater run-off will eventually fill the retention tank before by-passing the tank and being directed to the public stormwater sewer and then onto the Gallanstown Stream. This by-pass stormwater un-off will contain negligible concentrations of lead due to the occurrence of the 'first flush' effect.

As such, anticipated stormwater discharges to receiving surface waters are not expected to have a significant, adverse impact upon the water quality or aquatic ecology of the receiving water body, the Gallanstown Stream. An Assimilative Capacity Assessment has been undertaken demonstrating that the anticipated stormwater discharges to the Gallanstown Stream will not result in an exceedance of the Environmental Quality Standard for Lead in surface waters of 1.2 µg/l, as defined in the Surface Water Regulations. This assessment is shown in Appendix 8.

As 'first flush' stormwater discharges are being re-directed from entering surface waters to foul sewer, it is expected there will be a slight to moderate positive impact on the water quality of the Gallanstown Stream.

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Spills and Leaks of Hazardous Materials

Hazardous liquids stored and in use on-site, namely diesel and oil, have the potential to spill or leak and subsequently cause pollution affecting the aquatic ecology of receiving surface waters. Mitigation measures in the form of hazardous material bunding and emergency spill response procedures/equipment are in place to ensure the risk of such an occurrence is unlikely.

Firewater Run-off

A risk exists that a major fire could occur on-site as a result of a plant malfunction or accidental explosion. This could result in the release of hazardous substances and the generation of contaminated firewater. In the absence of Control and/or Mitigation Measures, contaminated firewater arising on-site may be released to the receiving water environment via the public storm drainage system. Such a worst-case scenario occurrence could have a severe, adverse impact upon receiving waters and their aquatic ecology.

The risk of such an occurrence is considered very low however considering fire prevention and control systems in place on-site as discussed earlier in this document (See Sections 4.8.9 and 4.8.10). In addition, firewater retention capabilities have been provided on-site to prevent the run-off of contaminated firewater to the environment (See Section 4.8.11 for details on Firewater Retention Capabilities on-site). It is therefore considered highly unlikely that contaminated firewater would be discharged to the receiving environment.

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6.4.2.2 Impacts upon Designated Conservation Areas

The nearest designated area to the site the Grand Canal pNHA which is situated approximately 300 metres to the south of the site. As there is no hydrological pathway between the site and the canal there will be no impact upon the canal as a result of aqueous emissions from the facility. It is not expected that the Grand Canal will be adversely impacted by noise and dust originating from the facility as noise and dust generated on-site site are predicted to have no significant off-site impacts.

A Stage 1 Appropriate Assessment Screening Assessment has taken place. This is a detailed assessment of the potential for the proposed activity having an impact upon European Sites (i.e. SPA's and SAC's). Having carried out an evaluation of the subject industrial activity, the surrounding environmental pathways and Natura 2000 sites within 15 km of the site, as well as having regard to the assessment criteria, the AA Screening Assessment objectively concluded that the proposed activity is not likely to have significant effects on the Natura 2000 sites identified. As such a Stage 2 Appropriate Assessment is not required to be submitted under the Licence Review. The Stage 1 Appropriate Assessment undertaken can be found in Appendix 9.

6.5 Mitigation Measures

The following Mitigation Measures will be implemented on-site to prevent and minimize the potential for adverse environmental impacts upon sensitive ecological receptors in the surrounding area:

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- The storage, handling and processing of materials will take place indoors to minimize noise and dust emissions emanating off-site which may impact upon ecology in the local area.
- Roadsweeping of the yard will take place on a weekly basis to minimize the levels of fugitive dust contained in the yard area.
- An air pollution abatement system comprising an air cyclone and a baghouse filter will reduce hazardous air emissions from smelting/refining processes that may contribute to reduced ambient air quality affecting local ecology.
- The construction of a Dual Flow Drainage System to ensure that stormwater containing elevated concentration of lead will be directed to foul sewer rather than towards the Gallanstown Stream.
- Hazardous liquids, namely diesel and oil, which may cause pollution affecting aquatic ecology, will be stored in bunds in accordance with EPA Guidance on the Storage and Transfer of Hazardous Materials.
- A spill response procedure will be in place for responding to spills or leaks of hazard liquids on-site. Spill containment equipment is provided on-site for this purpose.
- Fire prevention and control systems are in place on-site in order to ensure the prevention of a major fire scenario which could result in the release of contaminated firewater to the environment. These have been discussed already in See Sections 4.8.9 and 4.8.10.
- Underground tanks, a water retention tank, the stormwater drainage system and the kerbed, southern section of the yard will provide retention capabilities on-site ensuring any contaminated firewater generated during a fire scenario would not be discharged to the receiving environment.

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6.6 Residual Impacts

The Mitigation Measures detailed above, relating to noise, dust, air and aqueous emissions, will prevent and minimize the potential for adverse impacts upon sensitive ecological receptors in the surrounding area such as the Gallanstown Stream or the Grand Canal. As such, it is predicted that there will be no significant, adverse impact upon terrestrial or aquatic ecology in the surrounding area as a result of the proposed activity.

The redirection of stormwater containing elevated concentrations of lead to foul sewer will likely have a slight to moderate positive impact upon water quality and aquatic ecology contained in the receiving water body, the Gallanstown Stream.

6.6.1 Cumulative Impacts

The site is located in Clondalkin Industrial estate which is home to other commercial and industrial activities. In particular, Greyhound Recycling's Material Recovery Facility and Hammond Lanes Metal Recycling facility, which both pose environmental risk, are situated in the industrial estate. The area is distinctly industrial in character. Generally, it is not anticipated the continued operation of the subject facility and other facilities in the industrial estate when considered together will have a significant impact on important ecological features.

Stormwater run-off from the industrial estate is directed to the Gallanstown Stream and then onto to River Camac. This run-off could potentially have an adverse impact on the water quality of receiving waters and consequently aquatic ecology.

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Given that both of the aforementioned facilities are controlled under an IPC licence and a Waste Facility Permit respectively and given that stormwater discharges from these sites are monitored, controlled and appropriately treated where necessary under these authorizations, it is not anticipated that any significant polluting discharges will be discharged from these sites under normal circumstances. It is therefore deemed there will be no significant, cumulative effect upon aquatic ecology as a result of stormwater discharges from Metal Processors site in combination with these other sites in the estate. Given the redirection of first flush stormwater generated on-site to foul sewer, it is anticipated there will be a slight to moderate positive effect on receiving waters and aquatic ecology as a result of the proposal.

6.6.2 Indirect Impacts

As discussed above, the proposed activity has potential to affect receiving water body water quality and consequently aquatic ecology. The Impact Assessment study contained in the Water Chapter has concluded that the proposed activity will not have a significant, adverse impact on water quality in receiving waters however.

As there are no sensitive habitats within the vicinity of the site, it is not anticipated dust or noise emanating from the proposed activity site will adversely affect sensitive ecological receptors.

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7. Land, Soils & Hydrogeology

7.1 Introduction

This chapter of the EIAR describes the geological environmental of the site and its general environs and assesses the potential impact by the existing and proposed development on this environment. It also provides appropriate mitigation measures in relation to identified impacts, if deemed necessary.

7.2 Assessment Methodology

The assessment was undertaken by undertaking the following:

1. A desktop study of soils, subsoils and bedrock underlying the site and the general environs; The following sources of information were used in the compilation of this assessment:
   - Ordnance Survey of Ireland, Discovery Series, Sheet 50;
   - Ordnance Survey of Ireland (OSI) online historical maps and aerial photographs;
   - Geology of Kildare-Wicklow, Geological Survey of Ireland (GSI) (1:100,000), Sheet 16;
   - GSI On-line Geology Database. Aquifer Classification, Aquifer Vulnerability;
   - GSI Dublin Groundwater body (GWB);
   - Soil Map of Ireland (Second Edition, 1980), National Soil Survey of Ireland, An Foras Talúntais.
   - National Parks and Wildlife Service on-line database www.npws.ie;
   - EPA online water quality mapping; https://gis.epa.ie/EPAMaps/
   - OPW hydro-data (http://www.opw.ie/hydro-data);
   - Met Eireann - met.ie – monthly climatological data;
   - Dublin County Council online planning files and County Development Plan;
   - Landslides in Ireland. G.S.I. Irish Landslides Working Group (2006); and,
   - Directory of Active Quarries, Pits and Mines in Ireland (3rd Edition) G.S.I. 2002.
2. A walkover of the site and local area
3. Supervision of an intrusive site investigation comprising borehole drilling and trial pitting.
4. A review of all existing site investigation data across the site; and
5. An evaluation of all potential impacts on the soils and geology underlying the site and its immediate environs in accordance with EPA's impact criteria.
6. Interpretation of all data and reporting.

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This chapter was undertaken in accordance with the following:

- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002),
- Geology in Environmental Impact Statements a Guide, (IGI, 2002),
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes, NRA Document.
- Guidelines for the preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013),
- Draft EPA revised Guidelines on information to be contained in Environmental Impact Statements; and Advice Notes for preparing EIS, 2015.

7.3 Baseline Environment

7.3.1 Site Location and Context

The Metal Processors Limited facility comprises a number of industrial buildings located on Station Road, Clondalkin, Dublin 22, to the west of Dublin City centre and adjacent to the M50. The current landholding is situated in Clondalkin Industrial Estate and is immediately surrounded by commercial and industrial facilities. The total area of the site is approximately 1.85 hectares.

It is bordered to the north by the Dublin to Cork Railway Line, to the west the Station/Cloverhill road and to the east and south by industrial and commercial facilities.. The M50 motorway runs approximately 650 metres to the east of the site.

The majority of the site is utilised by Metal Processors Limited for the overall production operation, storage warehouses, access roads and car parking requirements.

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7.3.2 Historical Land Use

Metal Processors site operations were established at the Clondalkin site in 1998 operating under EPA licence no: P0401-01. However Metal Processors Limited was established in 1970 consolidating two companies, the 'Mining Company' and the 'Metal Processors', both of which were operating at the site before 1963. Earlier maps show the area to be agricultural/greenfield site.

7.3.3 Topography

Metal Processors Limited facility is located on a flat, concreted site and lies at an approximate elevation of 60.0 m above Ordnance Datum (mOD).

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7.3.4 Soils

The Geological Survey of Ireland (GSI) soil maps created by Teagasc, indicate that the soils across the site are classified as Made Ground. A small pocket of shallow well drained mineral (BminSW) exists north of the site. Areas of well drained mineral soil (BminDW), and poorly drained mineral soil (BminPD) are mapped in the general area. Mineral Alluvial (AlluvMIN) soils also exist adjacent to the Grand Canal southeast of the site. Lands to the northeast, east and southeast of the site are mapped as peaty soils (BktPT) while Ronanstown north of the proposed site is mapped as Made Ground.

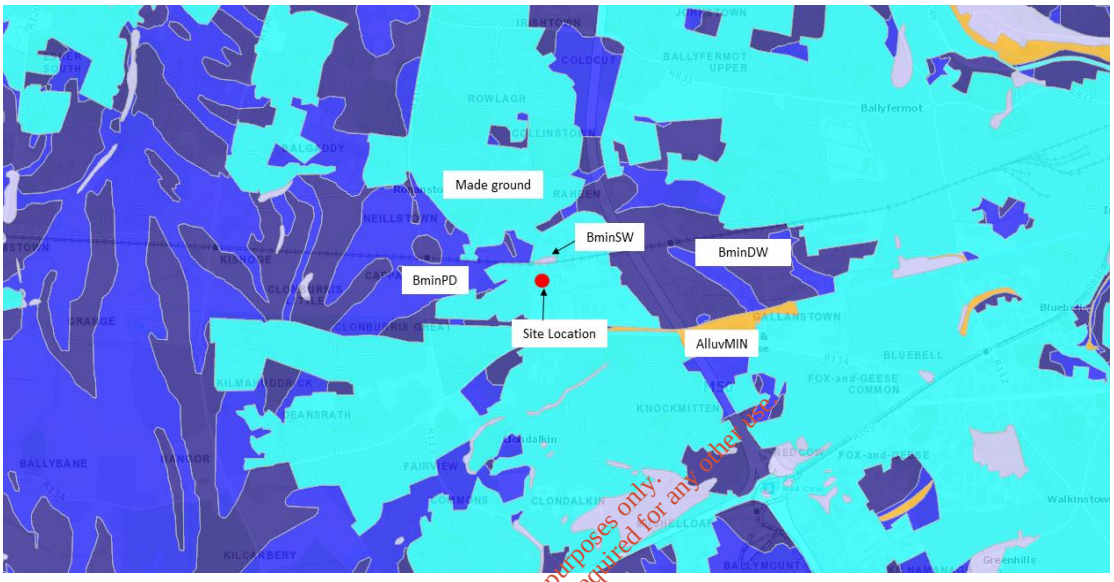

Figure 7-1 Topsoils

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7.3.5 Subsoil (Quaternary) Geology

The quaternary period is the most recent stage of the geological time period. It marks the period of the Ice Age and the postglacial period which extends to the present day. Most surface deposits were deposited in the Quaternary Period and provide the parent materials for the soils in the area.

Most sediments of the Quaternary period were deposited during the Ice Age itself either directly from the huge ice sheets or by meltwater from the sheets as they melted. Ice sheets would have slowly eroded the underlying bedrock producing sediment. This sediment may include particles of all sizes ranging from clay to boulder and which when spread over the surface by glacial ice, takes the form of till (boulder clay). Alternatively, sediment may be carried and sorted by meltwater and deposited as sand and gravel, with silt and clay deposited separately in lake systems or carried away to the sea. Glacial deposits therefore contain fragments of the type of bedrock over which the ice originally passed.

The GSI maps indicate that the Made Ground at the site is underlain by “Till” derived from limestones (Carboniferous), deep well drained mineral soil which is derived from mainly calcareous parent materials.

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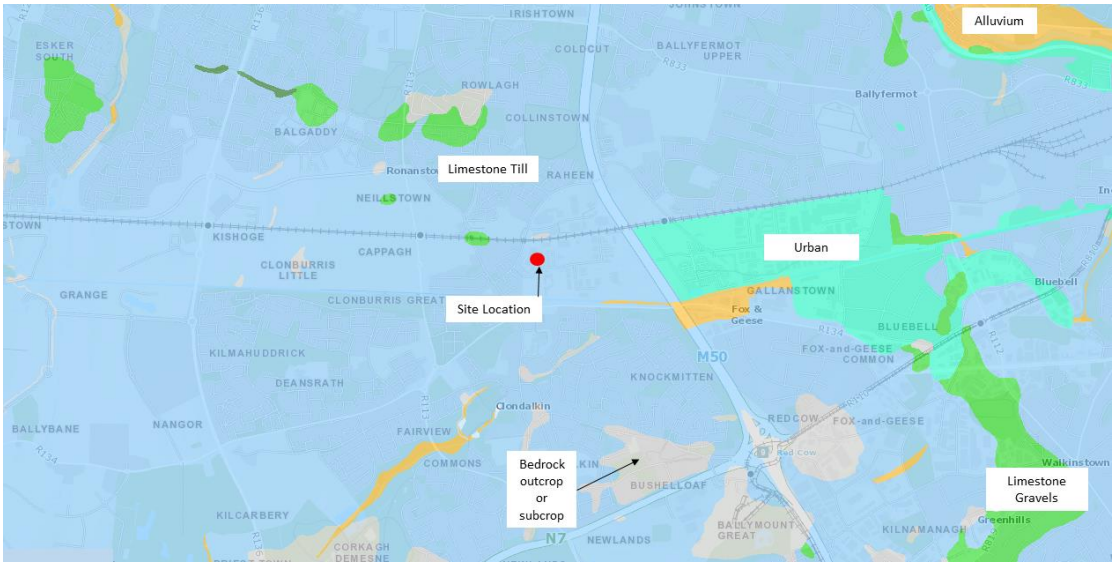

Figure 7-2 Subsoils

7.3.6 Bedrock Geology

According to the Geology of Kildare-Wicklow, Geological Survey of Ireland (GSI) (1:100,000), Sheet 16, the bedrock geology underlying the site consists of dark limestone and shale (Calp) bedrock of the Lucan Limestones. This formation comprises dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey.

No karst features have been mapped across or in the vicinity of the site by the GSI.

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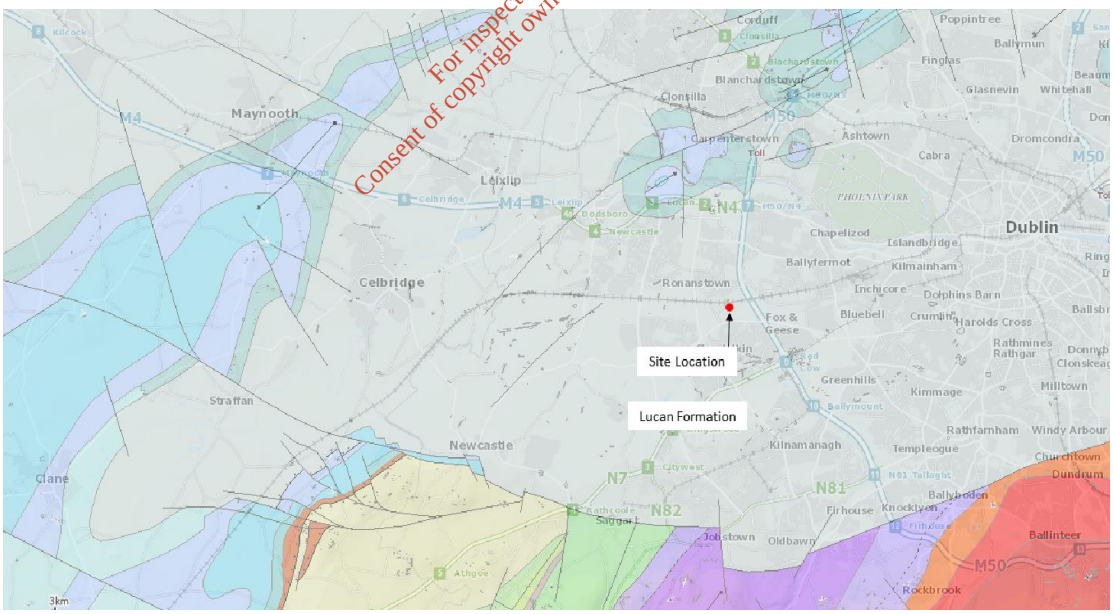

Figure 7-3 Bedrock Geology

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7.3.7 Site Investigation

No historical investigation reports were provided or reviewed during the compilation of this EIAR Land and Soils chapter.

A recent site investigation was undertaken across the site from 12th to 14th November 2018 to facilitate the recording of baseline ground conditions and the collection of soil samples for representative chemical testing.

The site investigation locations are presented in shown in Figure 7-4. The cross section is shown in Figure 7-5. The site investigation is summarised as follows:

- A total of six (6 no.) shallow boreholes (WS1 to WS6) were drilled to depths ranging between 1.25 and 3.0 mbgl using a window sample percussive drill rig. Two (2 no.) soil samples were collected from each borehole for chemical testing. Three (3 no.) deeper boreholes were drilled into bedrock ranging in depth between 9.0 and 13.0 mbgl. Each rotary borehole was installed with a 50 mm diameter monitoring well installation within the bedrock aquifer.
- WS1 to WS5 recorded made ground (i.e. a concrete slab and general fill material with a thickness of up to 0.25 m) overlying a soft to stiff brown/grey occasional green boulder clay (ranging between 0.25 and 3.0 metres in thickness) occasionally overlying thin bands of sands and gravels. WS6 comprised topsoil and grass over brown soft clay with pieces of broken slate, red brick and mixed gravels.
- Weathered bedrock was encountered at depths ranging between 3.5 and 3.8 mbgl (i.e. RH1 and RH3 respectively). Competent bedrock was encountered at depths ranging between 1.8 and 5.5 mbgl across the site.
- The soil analysis results indicated that the soil conditions across the Metal Processors site are consistent with natural background levels of such parameters in soils across Ireland and do not indicate any notable presence of contamination.
- A cross-section of the site is provided in Figure 7-5.

All driller's borehole logs are summarised in Table 7-1.

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Table 7-1 Summary of Window Sample Borehole Logs

WS ID	Thickness (m)	Description	Sample depths (m)
WS1	0	MADE GROUND - Concrete slab.	
	0.18	MADE GROUND - Limestone fill in a soft brown clayey matrix with traces of red brick.	
	0.25	Orange/Brown/Grey soft slight gravelly sandy CLAY. Sand fine to medium grained. Soft to firm with depth with occasional angular gravel. Dry (possibly made ground)	WS1-1 (0.1 - 0.5m)
	0.8	Brown fine slightly silty SAND. Fine to medium grained at 1.35m. Dry. Becoming wet between 1.0 - 1.2 m.	
	1.78	Brown soft to firm gravelly CLAY. Dry	WS2-1 (1.0 - 1.2m)
	2.1	Brown medium grained gravelly SAND. Moist	
	2.6	Black hard CLAY (Dublin Boulder Clay).	
	3	EOBH	
WS2	0	MADE GROUND - Concrete	
	0.2	MADE GROUND - - Limestone fill in a soft brown clayey matrix with traces of red brick.	
	0.25	Grey soft to firm CLAY with occasional gravel. Becoming light brown/greyish brown and stiff with depth. Occasional traces of red brick	WS2-1 (0.1 - 0.4m)
	1.35	Grey/green/brown soft to stiff CLAY. Dry.	WS2-2 (1.0 - 1.3m)
	1.8	Grey/brown sandy CLAY. Moist.	
	1.9	Grey/brown fine SAND. Moist.	
	2	Grey silty SAND. Wet.	
	2.75	Grey loose SAND and GRAVEL. Sand medium to coarse. Gravel subangular. Wet.	
	2.9	EOBH	
WS3	0	MADE GROUND - Tarmac	WS3-1 (0.1 - 0.4m)
	0.15	MADE GROUND - Gravel with granular limestone fill.	
	0.3	MADE GROUND - Grey/brown stiff CLAY with brick and pebbles. Dry	WS3-2 (1.0 - 1.3m)
	2	Dark grey stiff CLAY with sub angular gravels. Wet.	
	2.2	Broken rock - dark limestone	
	2.45	EOBH	
WS4	0	MADE GROUND - Concrete slab	
	0.2	MADE GROUND - Gravel with granular limestone fill.	
	0.4	Brown/green stiff gravelly CLAY. Dry.	WS4-1 (0.2 - 0.4m)
	1	Brown/green stiff gravelly CLAY. Gravel coarse and subrounded. Dry.	WS4-2 (0.8 - 1.0m)
	1.5	Brown firm to stiff CLAY with subrounded to subangular gravel. Moist.	
	1.6	Dark brown stiff CLAY/weathered bedrock. Moist.	
	1.65	EOBH	
WS5	0	MADE GROUND - Concrete slab	
	0.15	MADE GROUND - Gravel with granular limestone fill.	
	0.2	MADE GROUND - Grey/brown stiff clay with occasional gravel and red brick fragments. Dry.	WS5-1 (0.2 - 0.4m)
	0.6	Grey brown stiff CLAY. Dry.	
	0.8	Dark brown soft to stiff CLAY. Moist.	
	0.87	Black SAND & GRAVEL. Moist.	
	0.94	Brown firm to stiff CLAY.	
	1.0 - 1.15	Void – no recovery	
	1.15	Brown soft to stiff CLAY with iron staining. Dry.	WS5-2 (1.1 - 1.3m)

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WS ID	Thickness (m)	Description	Sample depths (m)
	1.4	Brown/grey firm to stiff gravelly CLAY. Gravel lense at 1.6m. Moist.	
	2.1	Brown stiff CLAY. Moist.	
	2.8	Wet broken limestone	
	2.9	EOBH	
WS6	0	MADE GROUND. Topsoil and grass over brown soft clay with broken slate, red brick and mixed gravels. Dry.	WS6-1 (0.7 - 0.9m)
	1.25	EOBH	WS6-2 (1.0 - 1.2m)

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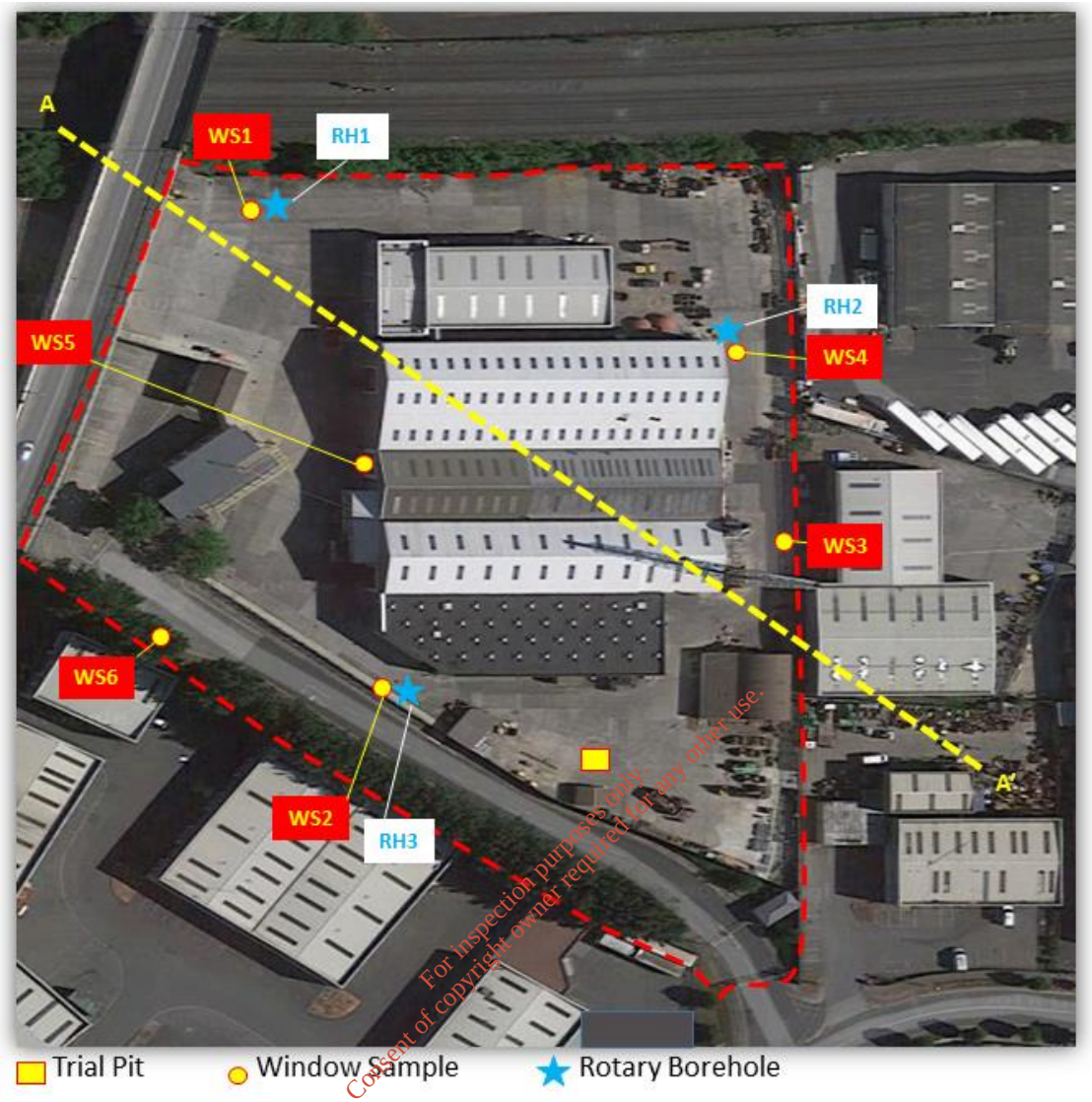

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Figure 7-4 Site Investigation Locations

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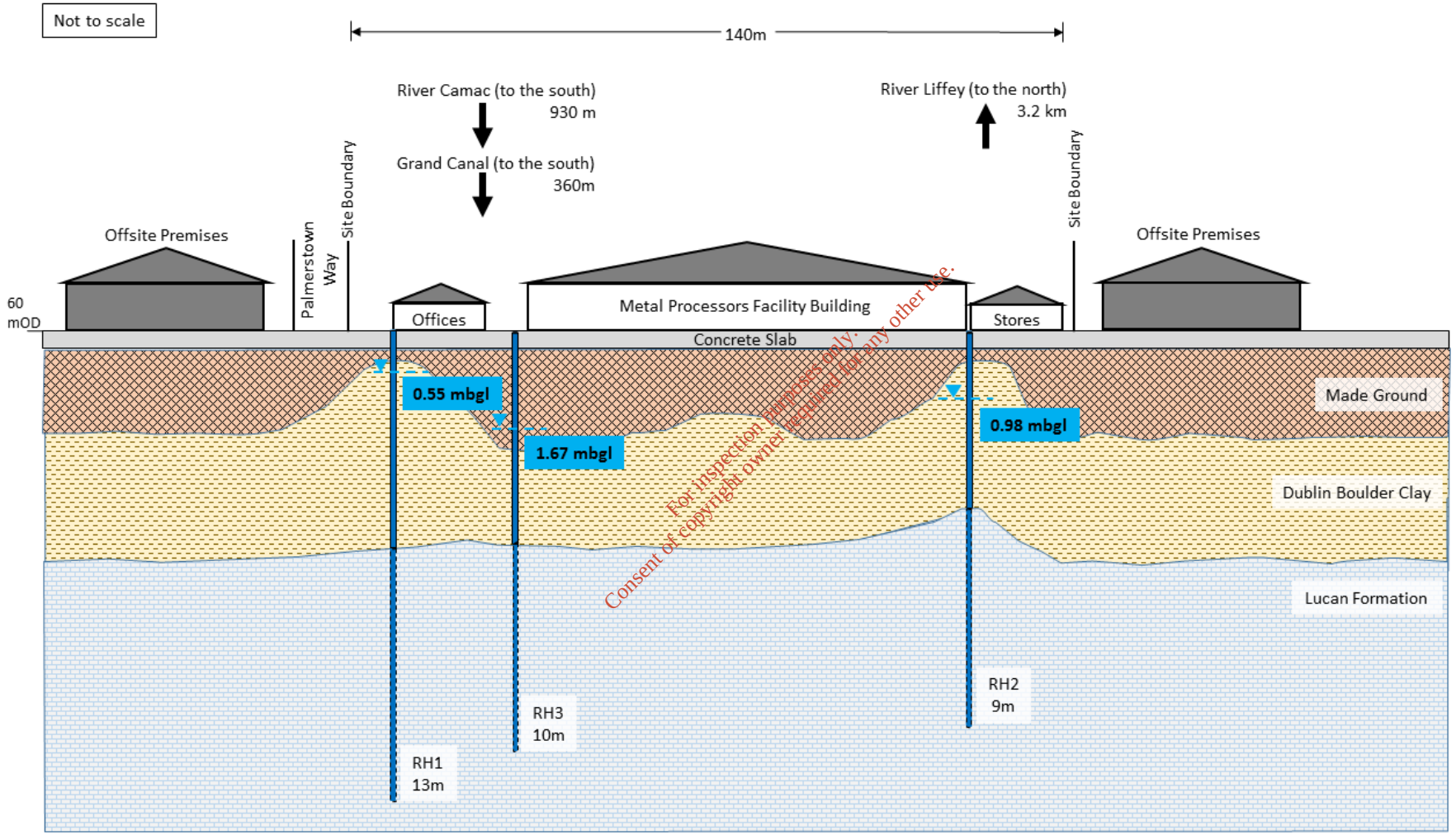

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Figure 7-5 Cross Section A_A'

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7.3.8 Designated Protected Areas

The National Parks and Wildlife Services online mapping does not show any designated areas within 5 km of the site. The Rye Water Valley/Carton SAC (northwest), the South Dublin Bay SAC (east) and the Glenasmole Valley SAC (southeast) are within 10 km of the site.

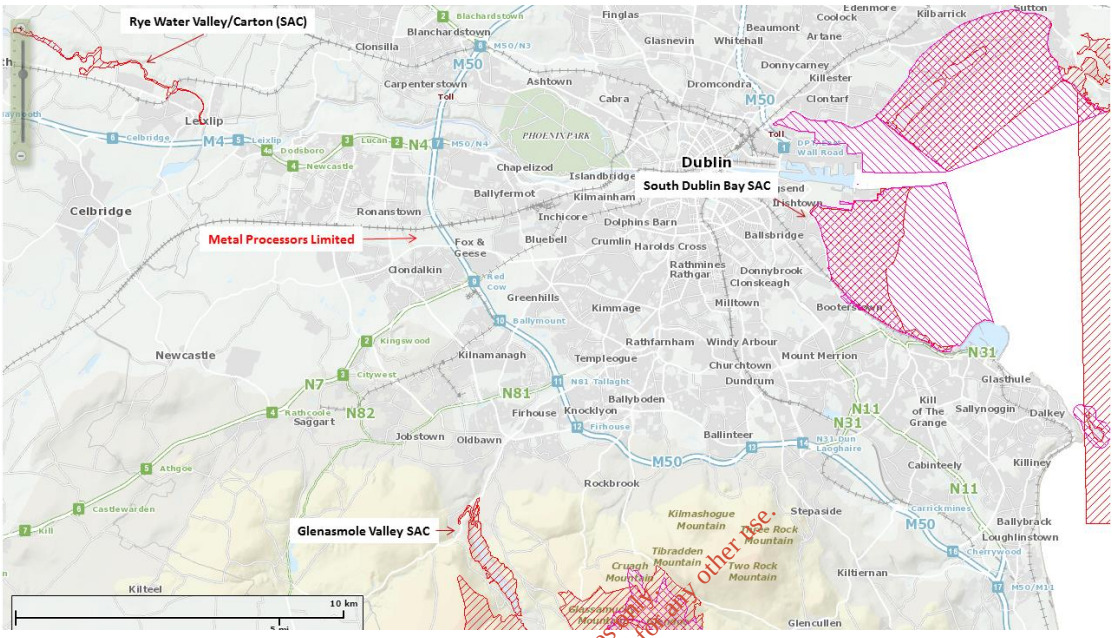

Figure 7-6 Designated Sites

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7.3.9 Radon

The EPA radon mapping indicates that the site lies within a low radon risk area where it is predicted that less than 10 per cent of homes will exceed the Reference Level of 200 bequerel per cubic metre (Bq/m3).

7.3.10 Hydrogeology

Groundwater can be defined as water that is stored in, or moves through, pores and cracks in sub-soils. The potential of rock to store and transport water is governed by permeability of which there are two types, inter-granular and fissure permeability. Intergranular permeability is found in sediments, sands, gravels and clays as are also present at the subject site, and fissure permeability which is found in bedrock, where water moves through (and is stored in) cracks, fissures, fracture planes and solution openings for example. Aquifers are generally classified as rocks or other matrices that contain sufficient void spaces and which are permeable enough to allow water to flow through them in significant quantities.

7.3.11 Aquifer Classification

The Geological Survey of Ireland has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the areal extent (km^2), well yield (m3 /d), specific capacity (m3 /d/m) and groundwater throughput (mm3 /d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-

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division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are subdivided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

According to the GSI Aquifer Map the Metal Processors site is underlain by a Locally Important (Ll) aquifer which is moderately productive only in local zones.

This aquifer has a limited and relatively poorly connected network of fractures, fissures and joints, giving a low fissure permeability which tends to decrease further with depth. A shallow zone of higher permeability may exist within the top few metres of more fractured/weathered rock, and higher permeability may also occur along fault zones. These zones may be able to provide larger 'locally important' supplies of water. In general, the lack of connection between the limited fissures results in relatively poor aquifer storage and flow paths that may only extend a few hundred metres.

Due to the low permeability and poor storage capacity, the aquifer has a low 'recharge acceptance'. Some recharge in the upper, more fractured/weathered zone is likely to flow along the relatively short flow paths and rapidly discharge to streams, small springs and seeps. Groundwater discharge to streams ('baseflow') can significantly decrease in the drier summer months.

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7.3.12 Aquifer Characteristics and Water Framework Directive Status

The site is located within the Dublin Groundwater Body (GWB) [Site Code: IE_SH_G_110]. Groundwater flow in this groundwater body occurs along fractures, joints and major faults. Most flow in this aquifer will occur near the surface. In general, the effective thickness of this aquifer is likely to be about 10 m, comprising a weathered zone of a few metres and a connected fractured zone below this. However, deep water strikes are commonly found in more isolated faults/ fractures at depths of 30 – 50 mbgl. Flow path lengths are not considered to be on a regional scale, and are typically less than 1km in length. There are no mapped groundwater karst features in the general locality. The Dublin GWB currently has a Water Framework Directive Score of "Good".

7.3.13 Aquifer Regional Vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures, the main feature that protects groundwater from contamination, and therefore the most important feature in protection of groundwater, is the subsoil (which can consist solely/ or of mixtures of peat, sand, gravel, glacial till, clays or silts).

Groundwater vulnerability is dictated by the nature and thickness of the material overlying the uppermost extent of the saturated zone. The GSI maps indicate that the groundwater vulnerability at the site is rated as E (Extreme) which is suggestive of shallow bedrock in this area. Exposed bedrock or rock near surface is mapped immediately to the north of the site (see Figure 7-7).

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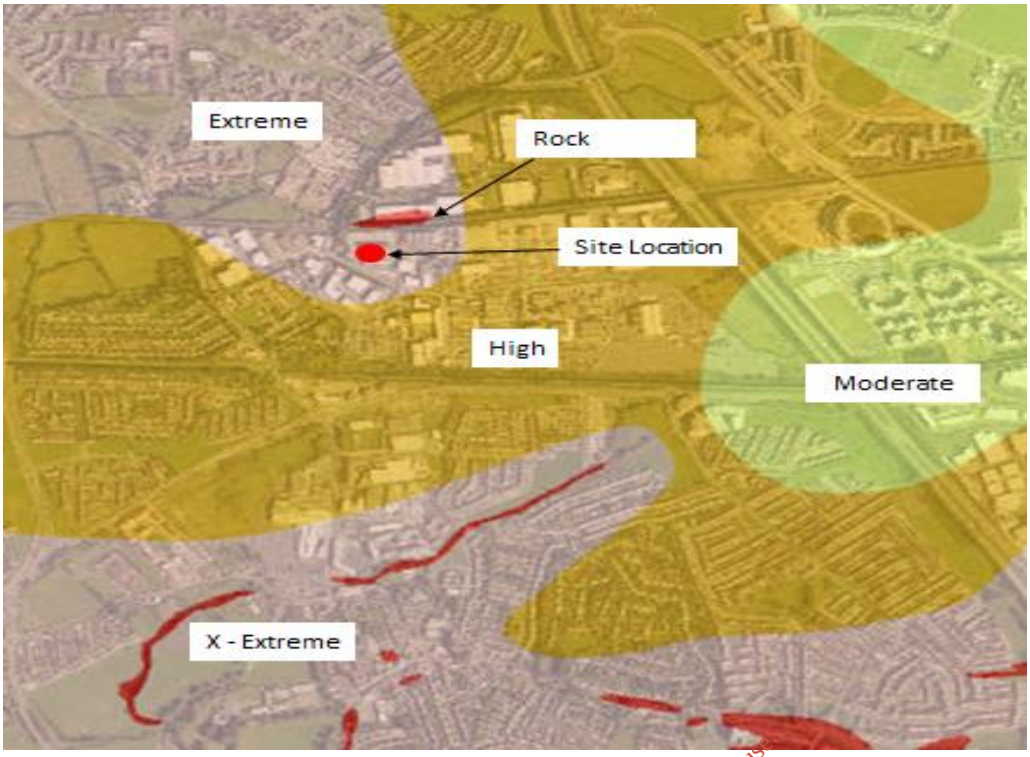

Figure 7-7 Groundwater Vulnerability

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7.3.14 Groundwater levels and Flow Directions

Three (3 no.) rotary boreholes were drilled in November 2018 and installed within groundwater monitoring well installations (see Figure 8-4). Monitoring well RH1 and RH3 are located upgradient of the facility and well RH2 is located downgradient of the facility. The three monitoring wells are screened within the dark limestone and shale (Calp) bedrock of the Lucan Limestones.

Groundwater levels recorded on the 27th November 2018 recorded groundwater levels ranging between 0.55 and 1.67 meters below ground level (mbgl) across the site. The water is recorded within the weathered bedrock although the water strikes indicate the boulder clay appears to be providing a confining layer above this water body forcing it to rise within the wells.

Groundwater levels suggest that groundwater flow direction is to the south towards the River Camac.

7.3.15 Groundwater Recharge

Groundwater recharge will be low due to the cement cap over much of Dublin City. It is estimated that 10% of the land area is available for recharge. According to the GSI groundwater data viewer the effective rainfall for the locality of the facility is estimated to be 349 mm/yr.

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7.3.16 GSI Well Database

A review of all abstraction wells within 2km of the site is outlined below. Both wells are located to the south of the site as per Table 7-2.

Table 7-2 Groundwater Sources within 2 km of the site

GSI Name	Well Type	Depth (meters)	Easting	Northing	Well Use	Yield m^3d	Yield Class
2923SEW005	Borehole	72.8	306850	231350	Industrial	185	Good
2923SEW006	Borehole	53.3	307320	231530	Industrial	157.1	Good

7.3.17 EPA/GSI Source Protection Zones

According to the Groundwater Source Protection Zone Map, the site is not located within a groundwater Source Protection Zone (SPZ).

7.3.18 Regional Hydrology

The site is located within the Liffey and Dublin Bay Catchment of the Eastern River Basin District. The principal hydrological feature in the area is the River Liffey located approximately 3.2 km to the north of the site. The Grand Canal is situated approximately 360 metres to the south of the site and the River Camac is situated approximately 930 metres to the south of the site. The River Camac rises in Mount Seskin 9 km southwest of Metal Processors facility and flows northwards through Rathcoole and Clondalkin to its confluence with the River Liffey at Heuston Station.

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The site is located in the surface water body catchment of the Camac Lower, which is a River Water Body contained in the IE_EA_Cammock Water Management Unit. The Gallanstown is a small stream that could be characterized as a drainage ditch due to its low flow. The stream merges into the River Camac approximately 760 metres south east of the site. The River Camac (sometimes spelled Cammock, or, historically, Cammoge or Cammoke) is one of the larger rivers in Dublin, and one of four main tributaries of the River Liffey.

The Grand Canal is situated approximately 300 metres to the south of the site. The Canal discharges to the River Liffey approximately 4 km east of the site. The site is not hydrologically connected to the Grand Canal.

The current Water Framework Directive Score for the Liffey River and the River Camac was checked though the EPA Maps (https://gis.epa.ie/EPAMaps/). The current score classifies the River Liffey and its tributaries as “At Risk”. The River Liffey monitoring station at Chapelizod Bridge (Lynch's Lane) indicates that the River Q value was 3-4 ‘Moderate’ in the last Q-year (2016) The closest operational monitoring station to Metal Processors on the River Camac is Riverdale Estate Bridge (RS09C020310) and the River Q value was designated as 3 ‘Poor’ in the last Q-year (2016).

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7.3.19 Site Drainage

The site is entirely paved. Currently, stormwater run-off on-site is directed by the site stormwater drainage system, via a series of settlement tanks, to the public stormwater sewer serving Clondalkin Industrial Estate. From there, stormwater run-off is directed to the Gallanstown Stream via an outfall pipe south of Crag Terrace situated approximately 380 metres to the south east.

7.3.20 Previous Site Investigations

No historical groundwater investigation reports were provided or reviewed during the compilation of this EIAR Land and Soils chapter.

- As described in Section 7.3.7, a site investigation was undertaken across the site from 12th to 14th November 2018 to facilitate the recording of groundwater conditions across the site. Three (3 no.) deeper boreholes were drilled into bedrock ranging in depth between 9.0 and 13.0 mbgl. Each rotary borehole was installed with a 50 mm diameter monitoring well installation within the bedrock aquifer.
- Three (3 no.) rotary boreholes were drilled during the site investigation and monitoring wells were installed within the dark limestone and shale (Calp) bedrock. Groundwater levels recorded on the 27th November 2018 ranged between 0.55 and 1.67 meters below ground level (mbgl).
- A single round of groundwater level monitoring and sampling was subsequently undertaken. The water levels recorded suggest that the overburden is providing a confining influence on the flow of groundwater within the bedrock underlying the site with groundwater flowing in a southerly direction towards the River Carmac (See Figure 7-8).

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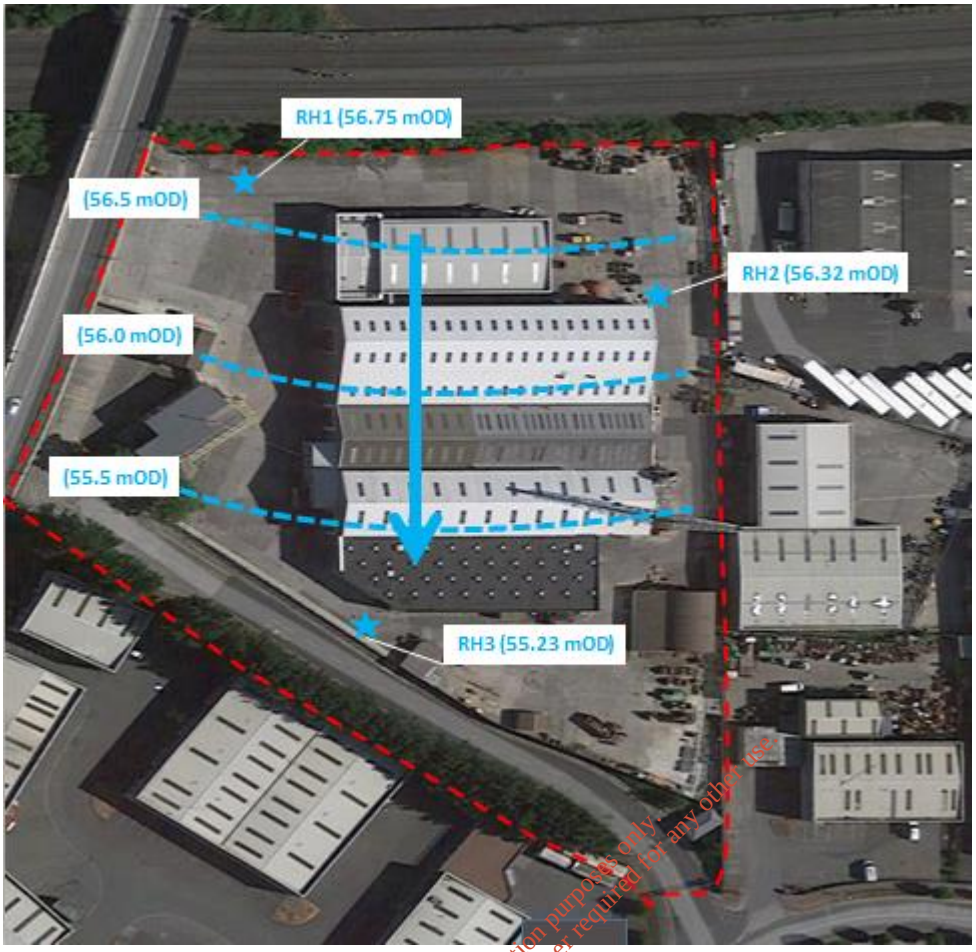

Figure 7-8 Groundwater Flow Direction

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- The groundwater monitoring results recorded levels of particular parameters slightly above the 2016 GTVs but generally indicate that groundwater quality underlying the Metal Processors facility is generally of a good quality. Very slight exceedances of Lead above the GTV (7.5 µg/l) were recorded within well RH1 and well RH3. Slightly elevated levels of Aluminium, Arsenic, Lead and Potassium were also recorded in upgradient well RH1. Based on groundwater flow direction these results are representative of upgradient conditions from the site. It is noted that similar levels of Lead were also recorded in downgradient monitoring well RH3 which confirms that the activities at the Metal Processors facility are not impacting on groundwater quality.

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7.4 Impact Assessment

7.4.1 Criteria for Determination of Impacts

The significance of potential impacts on geological and hydrogeological sensitive receptors was estimated by implementing an IGI, 2013 style of assessment using geological type attributes and IGI measures to determine the magnitude of the impact on the attribute. Table 7-3 illustrates the criteria for determining the importance of the geological and hydrogeological sensitive receptors at the site, Table 7-4 demonstrates the criteria for estimating the magnitude of the impact on an attribute and Table 7-5 presents the resulting estimation of significant potential impacts.

Table 7-3 Estimation of Importance of Sensitive Attributes

Importance	Criterion	Typical Examples
Very High	Attribute has a high quality, significance or value on a regional or national scale Degree or extent of soil contamination is significant on a national or regional scale Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale Degree or extent of soil contamination is significant on a local scale Volume of peat and/or soft organic soil underlying route is significant on a local scale	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale Volume of peat and/or soft organic soil underlying route is small on a local scale	Large historical and/or recent site for construction and demolition wastes Small historical and/or recent landfill site for construction and demolition wastes Poorly drained and/or low fertility soils Uneconomically extractable mineral resource

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Table 7-4 Estimation of the Magnitude of a Potential Impact on an Attribute

Importance	Criterion	Typical Example
Large Adverse	Results in loss of attribute and/or quality and integrity of attribute. Severe.	Loss of high proportion of future quarry or pit reserves Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate Adverse	Results in effect on integrity of attribute, or loss of part of attribute. Major.	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Irreversible loss of moderate proportion of local high fertility soils Requirement to excavate / remediate significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in some measurable change in attributes quality or vulnerability. Minor.	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity. Not significant.	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature

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Table 7-5 Estimation of the Significance of Potential Impact

Importance of Attribute	Magnitude of Potential Impact			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Very high	Imperceptible	Significant/Moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/Moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight / Moderate

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The procedure for the determination of potential impacts on the receiving environment was to identify potential receptors within the site boundary and surrounding environment and use the information gathered during the field work and desk study to assess the degree to which these receptors will be impacted upon. The application site is considered to be an integrated unit and has been assessed as such, such that the concept of cumulative impacts is not considered to apply to the components making up the overall site.

7.4.2 Potential Impact Risks

The prediction of potential impacts from the existing and proposed development are summarised in the Table 7-6, using the headings discussed under the criteria for determination of impacts.

Table 7-6 Potential Impacts

Construction Activity	Attribute	Character of Potential Impact	Importance of Attribute (see Table 8.3)	Magnitude of Potential Impact (see Table8.4)	Significance of Potential Impact (see Table 8.5)
Fuel storage/usage on site	**Subsoils**	Accidental spillage of contaminants during site activities may cause short to long term, moderate to significant impacts to subsoils, if not stored and used in a an environmentally safe manner.	Low	Small Adverse	Imperceptible
Fuel storage/usage on site	**Groundwater**	Accidental spillage of contaminants during site activities may cause short to long term, moderate to significant impacts to groundwater, if not stored and used in a an environmentally safe manner.	Medium	Moderate Adverse	Moderate
Vandalism	**Subsoils**	Pollution due to vandalism of stores, fuel tanks or plant poses a risk to soils and groundwater and to surface waters.	Medium	Moderate Adverse	Moderate
Historical Contamination	**Subsoils Groundwater**	Disturbance and release of pollutants during future construction site works. Although contaminated subsoils or groundwater or illegally deposited waste material is not anticipated nor was it detected during previous investigations, there exists a low residual risk of encountering unexpected contamination.	Medium	Moderate Adverse	Moderate

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Construction Activity	Attribute	Character of Potential Impact	Importance of Attribute (see Table 8.3)	Magnitude of Potential Impact (see Table8.4)	Significance of Potential Impact (see Table 8.5)
Surface water drainage system	**Subsoils Groundwater**	Leakages within the storm water drainage system could potentially result in an impact to the underlying subsoils and groundwater due to the potential presence of heavy metals within the rainfall runoff resultant from the 'first-flush' effect from the site.	Medium	Small Adverse	Slight

There is no likely impact on the geological heritage, sensitive groundwater receptors or groundwater supplies in the vicinity of the proposed development site as none are present in the immediate vicinity of the site.

7.4.3 Remedial & Mitigation Measures

The significant predicted impacts detailed under Table 8.6 are resolved under the mitigation measures set out under Table 7-7 (see below).

Table 7-7 Mitigation Measures

Construction Activity	Attribute	Character of Impact	Mitigation	Residual Impact
Fuel storage/usage on site	**Subsoils Ground water**	Accidental spillage of contaminants during construction works may cause short to long term, moderate to significant impacts to soils, if not stored and used in a an environmentally safe manner.	• Waste fuels and materials are currently stored in designated areas that are isolated from surface water drains or open waters (*e.g.* excavations). Hazardous wastes such as waste oil and chemicals are stored in sealed containers. Fuelling, lubrication and storage areas and site offices are not located within 30m of drainage ditches or surface waters. • All waste containers (including all ancillary equipment such as vent pipes and refuelling hoses) are stored within a secondary containment system (*e.g.* a bund for static tanks or a drip tray for mobile stores and drums). The bunds are capable of storing 110% of the tank capacity. Drip trays used for drum storage are capable of holding at least 25% of the drum capacity. Where more than one drum is stored the drip tray is capable of holding 25% of the aggregate capacity of the drums stored. • Regular monitoring of water levels within drip trays and bunds due to rainfall shall be undertaken to ensure sufficient capacity is maintained at all times.	Neutral

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Construction Activity	Attribute	Character of Impact	Mitigation	Residual Impact
			• Regular monitoring and maintenance of silt traps are be undertaken in accordance with the manufacturer's specifications. • Oil which accumulates within the petrol interceptor shall be regularly removed by an appropriately licensed contractor. In addition, the petrol interceptor shall be appropriately maintained in accordance with the manufacturer's specification. • Back-up plans to deal with the possibility of contamination, *e.g.* are included in an overall Environmental Management Plan (EMP) and Emergency Operation Plan (EOP) for the site. A contingency plan for pollution emergency shall address the following: • Containment measures; • Emergency discharge routes; • List of appropriate equipment and clean-up materials; • Maintenance schedule of equipment; • Details of trained staff; • Details of staff responsibilities; • Notification procedures to inform the relevant environmental protection authority; • Audit and review schedule; and, • List of specialist pollution clean-up companies and their telephone numbers.	
Vandalism	**Subsoils**	Pollution due to vandalism of stores or plant poses a risk to soils at the site.	• Adequate security measures shall be installed on the site. Security measures will include secure fencing, secure site access, securing site plant and equipment, secure storage of materials and sufficient warning signage.	Neutral
Historical Contaminated land / waste Import of Fill Material	**Ground water Subsoils**	Although contaminated land or illegally deposited waste material is not anticipated or previously detected during site investigation works, there exists a slight residual risk of encountering unexpected contamination or waste material.	• Special environmental and human health contingency plans and procedures, following best-practice guidance, shall be developed in the event of the unexpected and unlikely discovery of contaminated subsoils during any future redevelopment of the sites. These may include detailed site investigation, contamination delineation, risk assessment and appropriate remediation under the design and supervision of an	Neutral

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Construction Activity	Attribute	Character of Impact	Mitigation	Residual Impact
			experienced contaminated land engineer/hydrogeologist.	
Surface water drainage system	**Subsoils Ground water**	Leakages from the existing storm water drainage system could potentially result in heavy metal contaminated waters infiltrating to ground during the 'first-flush' event only.	• The existing storm network is regularly tested for leaks with no detected leaks recorded to-date. The proposed upgrade to the system will provide additional protection to the possibility of leaks occurring thereby ensuring no risk to the underlying subsoils and groundwater.	Neutral

7.5 Residual Impacts

There are no anticipated residual impacts on soils, geology and hydrogeology as a result of the existing facility development and proposed dual flow drainage system development given the site specific mitigation measures implemented onsite.

7.5.1 Potential Cumulative Impacts

The existing development is located in a well-established industrial estate. No other significant projects have been identified in the area of the existing development which would result in a significant cumulative impact on soils, geology or groundwater during the existing operations at the Metal Processors site.

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7.5.2 'Do-Nothing' Impacts

Due to the existing site operations and the presence of a concrete hard-standing across the site it is anticipated that there will be no impact on the soils, geology and hydrogeology underlying the site in the "Do Nothing" scenario.

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8. Water

8.1 Introduction

This chapter describes the baseline surface water hydrology in the local area and wider region and assesses the impacts the proposal may have on the characteristics and quality of receiving surface water bodies.

8.2 Assessment Methodology

The assessment of impact upon surface water hydrology features in the receiving environment involved the following steps:

1. A desk-based study, consisting of a review of available hydrological data on the site, the local environment and wider region, took place. The following sources of information were referred to:

    a. River Basin Management Plan 2018-2021
    b. Met Éireann Meteorological Database
    c. Ordnance Survey Ireland Map Viewer
    d. Water Framework Directive - WaterMaps Map Viewer
    e. Environmental Protection Agency (EPA) Envision public viewer
    f. National Parks and Wildlife Services Map viewer
    g. Construction Industry Research and Information Association (CIRIA) – "Control of water pollution from linear construction projects" (2006).

2. A walkover survey of the local area was undertaken in order to identify and characterize hydrological pathways and receiving surface water bodies.

3. Past emissions monitoring results were obtained and reviewed to assess the characteristics of past stormwater discharges from the site.

4. A stormwater/surface water body monitoring programme was established and implemented to assist in the evaluation and characterization of anticipated stormwater discharges from the site and the water quality of the receiving surface water body.

5. An Assimilative Capacity Assessment was undertaken in order to ascertain the effects anticipated aqueous discharges from the site would have been receiving surface waters.

6. An evaluation of the potential impacts the Proposed Activity may have upon the Water environment took place, having regard to the EPA's Impact Assessment criteria. Finally, the EIAR Chapter on Water reporting on the above was completed in accordance with EPA Guidelines on EIAR's.

The above steps were carried out by a Senior Environmental Consultant with many years' experience in Hydrological assessment and the assessment existing and proposed development may have upon the water environment.

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8.3 Baseline Environment

8.3.1 Surface Water Catchment

The site is located in the surface water body catchment of the Camac Lower, which is a River Water Body contained in the IE_EA_Cammock Water Management Unit. The site is entirely paved. Currently, stormwater run-off on-site is directed by the site stormwater drainage system, via a series of settlement tanks, to the public stormwater sewer serving Clondalkin Industrial Estate. From there, stormwater run-off is directed to the Gallanstown Stream via an outfall pipe south of Crag Terrace situated approximately 380 metres to the south east.

The Gallanstown is a small stream that could be characterized as a drainage ditch due to its low flow. The Gallanstown rises in Ronanstown and flows to Neilstown following a meandering course south eastward until it joins a canal ditch at Cappaghmore. It heads north of the ninth lock of the Grand Canal in Clondalkin before turning eastward and travelling closely alongside the Grand Canal. It then passes the M50 before flowing around the eight lock waterworks 'canal' reservoir at Gallanstown. It continues eastward passing the Killeen Road Bridge over the Grand Canal before making its way to beyond the sixth lock and joining its twin the Blackditch Stream east of the Killeen Road. The joint stream, now called the Galback Stream flows in an open channel between the Killeen Road and the Kylemore Road, before being culverted under the Kylemore Road and then the Grand Canal. It crosses southwards to Bluebell Lane and heads directly south to join the River Camac approximately 100 metres downstream of the Kylemore Road culvert crossing.

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The stream merges into the River Camac approximately 760 metres south east of the site. The River Camac. The River Camac (sometimes spelled Cammock, or, historically, Cammoge or Cammoke) is one of the larger rivers in Dublin, and one of four main tributaries of the River Liffey. The Camac forms from a flow from Mount Seskin (to the southwest of Dublin City) and other mountain streams, and an 18th century diversion from the Brittas River tributary of the River Liffey. It flows through a mountain valley, the Slade of Saggart, southwest of the broad Tallaght area and east of Newcastle, then past Saggart, through Corkagh Park and then Clondalkin. The Camac then continues on to Inchicore where it is tunnelled under the Grand Canal before a bridge crossing at Golden Bridge, and Kilmainham. From there it runs behind the jail museum, before entering the Liffey alongside Heuston Station, a little upstream of Sean Heuston Bridge. The river was tunnelled underneath the railway station when it was built in 1846.

The Grand Canal is situated approximately 300 metres to the south of the site. The Canal discharges to the River Liffey approximately 4 km east of the site. The site is not hydrologically connected to the Grand Canal.

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8.3.2 Surface Water Quality

The stretch of the River Camac running to the south and south east of the site has suffered from deterioration due to pressure and impacts associated with point and diffuse pollution sources. Past monitoring under the Water Framework Directive Monitoring Programme has shown that this stretch of the river has a poor biological status. Physico/chemical monitoring has also shown that this stretch of the river has high nutrient levels, namely high levels of Nitrate, Ammonium and Orthophosphate.

Table 8-1 Summary of Past Biological Monitoring on the River Camac (Camac 040)

Station ID	RS09C020400	RS09C020500
Station Name	Camac - Kylemore Rd Br	Camac Close Emmet Rd
Description of location	Kylemore Road - 100 metres upstream of where the Gallanstown Stream meets the River Camac	Camac Close - 2 km downstream of where the Gallanstown Stream meets the River Camac
Year of Last Monitoring	1998	2013
Biological status	Q3, Poor, Unsatisfactory	Q3, Poor, Unsatisfactory.

Water quality monitoring of the River Camac was undertaken under the Three Rivers Project, a water quality monitoring and management initiative conducted by the Department of the Environment and a number of Local Authorities in 2000/2001. Water quality results (physico/chemical and biological) showed that the river had elevated nutrient concentrations and a low biological status downstream of a wastewater treatment plant situated in Saggart. Point source pollution was identified as being the most significant source of pollution along the River Camac (e.g. discharges from Saggart WWTP). Diffuse source pollution was also considered a significant source of pollution. Diffuse sources of pollution such as minor misconnections, stormwater run-off and first flushes of stormwater were deemed to be having an adverse impact on the river. The river south of the subject site and downstream continues to be in an unsatisfactory state according to monitoring undertaken under the WFD Monitoring Programme.

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The Gallanstown Stream is not monitored under the WFD Monitoring Programme. It is deemed likely however that the Gallanstown Stream to the south and south east of the site is in a polluted state due to pressure and impacts from disuse pollution sources, namely urban run-off, similar to the River Camac.

Physico/chemical monitoring was undertaken at the Gallanstown Stream to the south of Clondalkin Industrial Estate as part of this chapter in order to ascertain the water quality of the stream. Water samples were collected from upstream and downstream of the outfall to the stream from Clondalkin Industrial Estate. A summary of these monitoring results is shown in the table below. It can be seen that there is an increase in concentrations of lead, mercury, arsenic, zinc, selenium and nickel downstream, with the EQS for mercury being exceeded and the SW EQS for nickel being reached.

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Table 8-2 Gallanstown Stream Surface Water Monitoring Results

Parameter	Unit	SW6 Gallanstown (Upstream) (16/10/2018)	SW7 Gallanstown (Downstream) (16/10/2018)	SW EQS (2009
pH	pH Units	8.1	7.9	-
Temperature	Degrees Celcius	13.5	13.9	-
Conductivity	µs/cm	245.0	260.0	-
BOD	mg/l	0.0	0.0	-
COD	mg/l	45.3	55.1	-
Suspended Solids (Total)	mg/l	<10.0	<10.0	-
Mineral Range Organics	mg/l	<0.1	<0.1	-
Cadmium (dissolved)	µg/l	<0.02	0.02	0.09
Lead (dissolved)	µg/l	<0.3	0.8	1.2
Mercury (dissolved)	µg/l	<0.5	1.0	0.07
Arsenic (dissolved)	µg/l	0.7	1.2	25
Zinc (dissolved)	µg/l	3.0	24.0	100 Note 1
Selenium (dissolved)	µg/l	0.5	1.3	-
Nickel (dissolved)	µg/l	<1.0	4.0	4
Copper (dissolved)	µg/l	2.0	1.3	30 Note 2
Chromium (dissolved)	µg/l	<1.0	<1.0	3.4 Note 3

Note 1: Limit is 100 µg/l given the water hardness levels in the region are greater than 100 mg/l.
Note 2: Limit is 30 µg/l given the water hardness levels in the region are greater than 100 mg/l.
Note 3: SW EQS pertaining to Chromium VI.

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8.3.3 Flood Risk

The site occupies 1.85 hectares. Impervious areas on-site account for 1.44 hectares of the site. Currently, surface water generated on-site is discharged via the site stormwater drainage system to the public stormwater sewer serving Clondalkin Industrial Estate, and then onto the Gallanstown Stream via an outfall from the estate to the south east of the site.

A review of the OPW's Catchment Flood Risk Assessment and Management programme took place to assess flood risk. There is an area approximately 500 – 750 metres to the south east of the site where there is a risk of flooding. This area is situated the other side of the Grand Canal along and adjacent to the banks of the River Camac. Given the elevation of the site relative to the expected elevation of potential flood events, given the distance from the areas at risk and the site and given the lack of a direct pathway from the areas at risk of flood and the site and the presence of intervening permeable areas, it has been concluded that there is a negligible risk the site would flood.

8.3.1 Past Stormwater Discharge Monitoring

The applicant currently operates under an Industrial Emissions Licence which requires them to undertake periodic monitoring of stormwater discharges from their site. Currently, there is one stormwater discharge point on-site, emission point SW4. As mentioned stormwater is currently discharged directly from the site the public stormwater sewer serving Clondalkin Industrial Estate, before being directed via pipeline to the Gallanstown Stream. Past stormwater discharge monitoring results for relevant substances of concern are shown are shown in the table below.

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Table 8-3 Past Stormwater Monitoring Results 2016 - 2018

Parameter	Unit	Past Stormwater Monitoring Results					
		B1 2016	B2 2016	B1 2017	B2 2017	B1 2018	B2 2018
pH	pH Units	7.4	7.5	7.3	7.5	7.45	7.7
Conductivity	µs/cm	329	339	330	340	262	322
Chromium (dissolved)	µg/L	0.6	0.6	0.7	0.6	0.9	1
Copper (dissolved)	µg/L	2.83	2.69	2.4	2.4	21	0.031
Lead (dissolved)	µg/L	26.3	0	41.76	38.2	36.98	131
Nickel (dissolved)	µg/L	2.17	1.04	1.6	1.5	1.8	3.3
Arsenic (dissolved)	µg/L	4	3.5	3	4	0.045	0.8
Aluminium (dissolved	µg/L	12.3	14.35	10.6	13.2	8	35

It is noted that Lead concentrations in stormwater run-off from the site have occasionally been elevated in recent years. The applicant has therefore carried out additional stormwater monitoring for Lead on-site. A table summarizing stormwater monitoring for Lead in recent years is shown below.

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Table 8-4 Stormwater Monitoring Results for Lead 2014 – 2019

Results				
Date	Sample Point	Pb Concentration (µg/l)	Compliance Level (µg/l)	Comments
01/08/2014	SW4	52.60	7.2	
06/10/2014	SW4	30.00	7.2	
13/11/2014	SW4	27.90	7.2	
16/12/2014	SW4	50.00	7.2	
23/01/2015	SW4	25.10	7.2	
13/02/2015	SW4	50.00	7.2	
20/05/2015	SW4	32.80	7.2	
17/06/2015	SW4	23.70	7.2	
08/07/2015	SW4	10.00	7.2	
13/08/2015	SW4	30.00	7.2	
07/09/2015	SW4	10.00	7.2	
09/11/2015	SW4	17.55	7.2	
04/12/2015	SW4	17.67	7.2	
19/01/2016	SW4	26.19	1.2	
19/02/2016	SW4	32.55	1.2	
05/05/2016	SW4	24.14	1.2	
21/06/2016	SW4	22.32	1.2	
14/12/2016	SW4	220.00	1.2	After prolonged dry period
01/03/2017	SW4	44.15	1.2	
03/03/2017	SW4	39.36	1.2	
31/07/2017	SW4	26.08	1.2	
21/08/2017	SW4	13.81	1.2	
11/09/2017	SW4	31.90	1.2	
31/10/2017	SW4	90.00	1.2	
30/11/2017	SW4	54.33	1.2	1st sample
30/11/2017	SW4	13.12	1.2	2nd sample taken 30 mins after 1st sample
31/01/2018	SW4	71.36	1.2	After prolonged dry period
03/04/2018	SW4	2.60	1.2	After large amount of continuous rainfall
15/10/2018	SW4	208.00	1.2	1st heavy rainfall after extensive dry period
06/11/2018	SW4	54.00	1.2	
08/02/2019	SW4	65.20	1.2	
16/04/2019	SW4	98.30	1.2	1st heavy rainfall after extensive dry period

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8.4 Impact Assessment

8.5 Construction Phase Impacts

Activities with the potential to impact receiving waters during the construction phase include:

- Run-off from excavation and construction areas that may be contaminated with silt.
- Spill and leaks of fuels and oils used in road vehicles and mobile plant.

Considering the above, there is potential for construction phase activities to have a negative, slight, short term impact on receiving waters. It is necessary to develop mitigation measures to prevent the discharge of surface water run-off containing elevated levels of pollutants to receiving waters.

8.6 Operational Phase Impacts

8.6.1 Aqueous Emissions

8.6.1.1 Wastewater Emissions

The proposed activity will not result in the generation of any trade effluent. Domestic effluent arising on-site will be discharged to foul sewer.

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8.6.1.2 Emissions to Ground

There will be no direct or indirect emissions to ground associated with the proposed activity. The entire site is entirely underlain by an impermeable concrete surface.

8.6.1.3 Stormwater Emissions

8.6.1.3.1 Risk of Stormwater Contamination

The storage and processing of lead and other metals will take place indoors in order to minimize the potential for the contamination of stormwater run-off with metals. Rainfall onto roof areas and hardstanding outdoor areas on-site will result in the generation of stormwater run-off. The handling, storage and processing of lead at the facility can result in the generation of airborne lead dust. There is a risk that lead dust will emanate from storage and processing areas in buildings to the yard area by way of the entrances to buildings. Consequently, there is a risk that settled lead dust could become entrained in stormwater run-off arising in yard areas. It is proposed to utilize a dual flow drainage system to ensure first flush stormwater containing elevated levels of pollutants is discharged to foul sewer.

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8.6.1.3.2 Dual Flow Drainage Proposal

In order to prevent the discharge of stormwater run-off, potentially containing elevated concentrations of lead, to the receiving water body, the Gallanstown Stream, it is proposed to develop a Dual Flow Drainage System on-site. The proposed Dual Flow Drainage System is described in detail in Section 4.7. The system is designed in accordance with the Greater Dublin Strategic Drainage Study (Vol. 2), Appendix E – Design of Stormwater Storage, namely Section E1.1.4 on managing the quality of stormwater run-off.

Under the Dual Flow Proposal, 'First Flush' stormwater, potentially containing elevated concentrations of lead, will be directed to a retention tank before being gradually released to foul sewer at a maximum flow rate of 2 litres/second via an emission point that will be labelled SE1. The applicant has been informed by Irish Water through their authorized agent South Dublin County Council that they will accept discharge to foul sewer at a rate of 2 L/sec with a maximum lead concentration of 500 µg/l (It is noted that no past stormwater monitoring result has exceeded this threshold, see Table 8-4). Irish Water have carried out Assimilative Capacity calculations considering lead discharges to foul sewer from the site and have deemed such discharges acceptable. Confirmation from South Dublin County of acceptance of discharges to foul sewer as well as details of their assimilative capacity calculations carried out is shown in Appendix 10.

During a prolonged or intense rainfall stormwater run-off will eventually fill the retention tank before by-passing the tank and being directed to the public stormwater sewer and then onto the Gallanstown Stream. It is anticipated that by-pass stormwater will contain negligible levels of lead due to the occurrence of the 'first flush' effect.

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First Flush is defined as '*the discharge of a larger mass or higher concentration in the early part of a storm relative to the later part of the storm. The term can be applied to any contaminant. The magnitude of the first flush will depend on site specific conditions, but the term first flush is applicable*.'[3]

Pollutants which have built up on land are removed from the surface and become entrained in 'first flush' stormwater. This stormwater therefore contains elevated concentrations of pollutants that have been picked up by it. Stormwater generated following 'first flush' (i.e. due to prolonged or intense rainfall) consequently has relatively low levels of pollutants due to their removal from rainwater catchment surfaces during 'first flush.'

8.6.1.3.3 Monitoring the Effects of 'First Flush'

On 30/11/2017, following a significant dry period, Metal Processors conducted stormwater monitoring during a period of rainfall in order to ascertain the effects of 'first flush.' A sample was collected during a period of initial rainfall and a subsequent sample was taken after 30 minutes of rainfall. Both samples were tested for Lead. The results showed a drop in Lead concentrations from 54.33 µg/l to 13.12 µg/l. It is considered that this drop in concentration is as a result of the first flush effect occurring over a half hour time period.

On 03/04/2018, following on from a period of continuous rainfall, Metal Processors collected a stormwater sample. It was tested for Lead and the result was 2.6 µg/l. It is considered this relatively low concentration was as a result of the preceding continuous period of rainfall and the occurrence of the first flush effect.

[3] First Flush Phenomenon Characterization, California Department of Transportation, Division of Environmental Analysis, August 2005

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On 14/12/2016, 31/01/2018, 15/10/2018 and 16/04/2019 monitoring of stormwater took place following prolonged dry periods. Elevated levels of lead were recorded in these instances. It is considered that these high results were recorded due to there being no preceding rainfall for a significant period of time rain and the lack of the first flush occurring on-site. Where there are periods of intermittent rainfall and first flushes on-site monitoring carried out shows that lead levels recorded in stormwater discharges reduce.

8.6.1.3.4 Analysis of Past Stormwater Monitoring Results

Past stormwater monitoring results, shown in Table 8-3 and Table 8-4, show that Lead levels in stormwater discharges from the site can occasionally be elevated. All other parameters tested for are not considered to be present in significant concentrations.

It is noted that all substances tested for, including Lead, were detected in stormwater discharges from the site in concentrations far below BAT-associated emission levels for direct emissions to a receiving water body from the production of Lead, as prescribed in BAT Conclusions for the non-ferrous metal industry (2016). A comparison between past monitoring results for substances of concern and BAT associated emission levels, where prescribed, is shown in Table 8-5 below.

Table 8-5 Comparison of Past Stormwater Monitoring Results with Relevant BAT Emission Limits

Parameter	Unit	Results								
		B1 2015	B2 2015	B1 2016	B2 2016	B1 2017	B2 2017	B1 2018	B2 2018	BAT Limit
Copper (dissolved)	µg/l	28.55	29.97	2.83	2.69	2.4	2.4	21	0.031	200
Lead (dissolved)	µg/l	32.9	17.04	26.3	0	41.76	38.2	36.98	131	500
Nickel (dissolved)	µg/l	1.98	2.07	2.17	1.04	1.6	1.5	1.8	3.3	500
Arsenic (dissolved)	µg/l	3.3	3.6	4	3.5	3	4	0.045	0.8	100

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Monitoring at the Gallanstown Stream downstream of where stormwater discharges from the Clondalkin Industrial Estate discharges into it (as shown in Table 8-2) shows that the concentrations of Mercury, Zinc, Selenium and Nickel is elevated compared with upstream levels. Stormwater discharges from the site have not been tested for these parameters before.

Considering this, it was decided to test stormwater discharges from the site for these parameters to ascertain that run-off from the site is not resulting in these elevated levels. A stormwater sample was collected from the site on 16/04/2019 and tested. Stormwater monitoring results for these parameters of interest are shown in the table below. A comparison has been made with SW EQS's, where prescribed.

Table 8-6 Stormwater monitoring Results for Other Parameters of Interest.

Parameter	Unit	Result	SW EQS
Mercury	µg/l	0.03	0.07
Zinc	µg/l	110	100 Note 1
Selenium	µg/l	1.3	-
Nickel	µg/l	0.9	4

Note 1: Limit is 100 µg/l given the water hardness levels in the region are greater than 100 mg/l

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The above stormwater monitoring results show that levels of Mercury, Selenium and Nickel contained in stormwater run-off from the site are relatively low and therefore not significant. Zinc levels in stormwater run-off are somewhat elevated however. It is considered that Zinc levels in stormwater run-off may be as a result of site activities and may be contributing to the increase in Zinc levels in the Gallanstown Stream downstream of the outfall point from Clondalkin Industrial Estate.

As it is proposed to develop a Dual Flow Drainage System which directs 'first flush' stormwater run-off to foul sewer via SE1, it is expected that the concentration of the substances of concern (e.g. Lead and Zinc) in stormwater discharges to the receiving water body will be significantly reduced to acceptable levels however. By-pass stormwater discharges, occurring after a prolonged or intense rainfall and the occurrence of the First Flush Effect, are anticipated to contain low levels of pollutants. It is not envisaged that by-pass discharges will have a significant adverse impact upon the receiving water body. It is anticipated that the development of the dual flow proposal will have a slight to moderate positive impact on the water quality of the Gallanstown Stream.

There are no proposals to change operational processes on-site in a manner that might result in an increase the concentration of heavy metals in stormwater run-off.

8.6.1.3.5 Assimilative Capacity of the Receiving Water Body

An Assimilative Capacity Assessment was undertaken to determine the potential impact anticipated by-pass stormwater discharges (associated with the dual flow drainage proposal) will have upon the receiving water body, the Gallanstown Stream. As Lead is considered the main substance of concern, this parameter was considered in the Assimilative Capacity Assessment.

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The Assimilative Capacity Assessment has shown that the assimilative capacity of the Gallanstown Stream is sufficient for accepting by-pass surface water discharges from Metal Processors proposed dual flow drainage system, given the SW EQS for Lead of 1.2 µg/L, given evidence of the first flush effect occurring over time on-site and given the time it will take for the proposed retention tank to be used in connection with the dual flow system to fill up.

The Assimilative Capacity Assessment has shown that a conservative Lead emission limit value of 30 µg/l should be applied to site by-pass stormwater discharges to the public storm sewer going forward to ensure the protection of the receiving water body (i.e. to ensure the Lead SW EQS of 1.2 µg/L is not exceeded at the water body).

It was further noted that an exceptional rainfall event involving a period of prolonged or intense rainfall would need to occur before the proposed retention tank fills up and stormwater gets discharged to public storm sewer and then onto the receiving surface water body. As this is the case, it is anticipated that the receiving water body would be in fuller flow when accepting by-pass stormwater discharges from the site, ensuring that it would have a far greater assimilative capacity than during dry conditions.

This Assimilative Capacity Assessment is shown in Appendix 8.

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8.6.1.3.6 Evaluation of Impacts of Stormwater Discharges

In summary, with reference to past monitoring results at the site and the Assimilative Capacity Assessment carried out, it is deemed that there will be no significant adverse impact upon the receiving water body as a result of any by-pass stormwater discharges associated with the proposed dual flow system.

The concentration of Lead in the Gallanstown Stream downstream from the outfall point as of 16/10/2018 is 0.8 µg/L. This is less than the SW EQS for Lead of 1.2 µg/L.

As stormwater containing elevated concentrations of pollutants will be directed away from being discharged to the receiving water body and towards foul sewer instead (and subsequently Ringsend WWTP), it is anticipated there will be a slight to moderate positive impact on water quality in the Gallanstown Stream. It is considered that some potential exists for the improvement of the physical, chemical and biotic characteristics of the Gallanstown stream.

8.6.2 Hazardous Materials

There is a limited risk to waters associated with the spill or accidental release of hazardous materials present on-site. Hazardous materials such as oils and fuels will be stored in bunded locations. Oils and fluids used for the running of forklift vehicles will be stored in sump pallets in the Maintenance Workshop. Diesel will be stored in a tank located within a reinforced mass concrete bund. These bunds have recently been hydrostatically tested in order to verify that they are fit for purpose.

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8.6.3 Contaminated Firewater Run-off

A limited risk exists that a major fire could occur on-site as a result of a plant malfunction or accidental explosion. This could result in the release of hazardous substances and the generation of contaminated firewater. The risk of such an occurrence is considered extremely low considering fire prevention and control systems in place. In addition, firewater retention capabilities have been provided on-site to prevent the discharge of contaminated firewater to receiving waters (See Section 4.8.11).

8.6.4 Stormwater Attenuation

The development of a stormwater retention tank on-site in connection with the proposed Dual Flow Drainage System and in accordance with SUDS principles defined in the Greater Dublin Strategic Drainage Study will result in improved attenuation of stormwater run-off from the site. Although unquantifiable, it can be expected that improved attenuation on-site will slightly reduce the likelihood of floods occurring at receiving surface water bodies, namely the Gallanstown Stream and River Camac. Improved stormwater attenuation on-site will have a slight positive impact on the receiving water environment, in that the likelihood of flooding in receiving water bodies will slightly reduce.

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8.7 Mitigation Measures

8.7.1 Construction Phase Mitigation Measures

The following Mitigation Measures will be implemented by the applicant to prevent adverse impacts upon the receiving water environment as a result of the proposed activity:

- Excavated materials will be stored in skips temporarily in order to prevent the siltation of surface water run-off.
- Smaller mobile skips and bins will be conveniently located in various work areas. These containers will be well-marked and kept clean to prevent contamination.
- Good housekeeping practices will be implemented (daily clean ups of construction area, designated waste areas) during construction.
- An emergency/spill response procedure will be in place. Any spillages shall be immediately contained and cleaned up using spill kits, which shall be available to the construction contractor.
- Site preparatory works and excavation works will be carried out in such a manner that surfaces will be designed with adequate falls, profiling and drainage to promote safe run-off, minimization erosion and siltation of surface water run-off, and prevent ponding and flooding.
- Hazardous materials which may be present on-site (e.g. fuels or oils) should be stored in a separate, enclosed, bunded area designed to retain 110% of the volume of the largest tank or 25% of the total storage capacity, whichever is the greater. Bunding shall be impermeable to the substance that is being stored in the tank.
- Plant and equipment servicing and maintenance should be carried out on a regular basis in order to minimize the potential for leak or spills of hazardous materials (e.g. fuels or oils).
- The existing drainage network and series of settlement tanks will be retained on-site during the construction phase in order to prevent the discharge of silt to public storm sewer.

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8.7.2 Operational Phase Mitigation Measures

The following Mitigation and Control measures will be implemented during the operational phase to prevent adverse impacts upon the receiving water environment:

- A dual flow drainage system will be developed in order to direct stormwater containing elevated concentrations of pollutants to foul sewer and away from the Gallanstown Stream.
- All raw material, intermediates and finished product will be stored indoors to minimize the potential for contaminating stormwater with trace amounts of heavy metals.
- All processing operations, namely smelting/refining, milling and metal working activities, will take place indoors to minimize the potential for contaminating stormwater with trace amounts of metal.
- A roadsweeper truck will be used to sweep the yard on a weekly basis to minimize the amount of dust generated on yard areas and the potential for the discharge of stormwater containing elevated concentrations of Lead or other pollutants.
- A water spray is used during loading of scrap lead into hopper/conveyor belt to suppress lead dust in the refining area.

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- Internal floors in processing areas in the Refining Area, Engineering Works Area and Milling Area are cleaned on a daily basis.
- Water misters are used during offloading of incoming raw materials to dampen down dust in the Material Intake Store
- A series of existing settlement tanks are present on-site. In the event of the development of the dual flow system these settlement tanks will be retained to treat any by-pass stormwater discharging from the site to public storm sewer and then onto the Gallanstown Stream. These settlement tanks will reduce the amount of suspended particles in stormwater emanating from the site.
- Silt traps will be present along site surface water lines to capture suspended particles.
- The drainage system will be cleaned out on a yearly basis by a service provider to ensure functionality and to keep lead concentrations in stormwater run-off low.
- A reinforced mass concrete bund will be situated on-site to act as secondary containment for two diesel primary storage tanks, in order to prevent the release and run-off of hazardous materials to the drainage system.
- Oils (e.g. motor oil, hydraulic oil) will be stored on-site in pre-fabricated plastic bunds in the Maintenance Workshop Building in order to prevent their release.
- A spill response procedure is in place on-site and spill containment kits are provided on-site to ensure any spills or releases of hazardous materials are a promptly responded to and adequately dealt with.
- It is proposed to install oil interceptors before the outlets of the foul and surface water drainage system in order to prevent the discharge of hydrocarbons. This will be serviced on annual basis to ensure functionality.
- Fire prevention and control systems are in place on-site in order to ensure the prevention of a major fire scenario which could result in the release of contaminated firewater to the environment.
- Underground tanks, a water retention tank, the stormwater drainage system and the kerbed, southern section of the yard will provide retention capabilities on-site ensuring any contaminated firewater generated during a fire scenario would not be discharged to the receiving environment.

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8.8 Residual Impacts

Considering the mitigation measures listed above, it is not deemed that there will be any significant, adverse impact upon the receiving water environment as a result of the proposed activity.

As the Dual Flow Drainage proposal will involve the redirection of stormwater containing elevated Lead concentrations from away from being discharged to the receiving water body and towards foul sewer instead, it is anticipated there will be a slight to moderate positive impact on water quality in the Gallanstown Stream.

Improved stormwater attenuation on-site will have a slight positive impact on the receiving water environment, in that the likelihood of flooding in receiving water bodies will slightly reduce.

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8.8.1 Cumulative Impacts

The site is located in Clondalkin Industrial estate which is home to other commercial and industrial activities. In particular, Greyhound Recycling's Material Recovery Facility and Hammond Lanes Metal Recycling facility are situated in the industrial estate. Stormwater run-off from the industrial estate is directed to the Gallanstown Stream and then onto to River Camac. This run-off could potentially have an adverse impact on the water quality of receiving waters and consequently aquatic ecology.

Given that both of the aforementioned facilities are controlled under an IPC licence and a Waste Facility Permit respectively and given that stormwater discharges from these sites are monitored, controlled and appropriately treated where necessary under these authorizations, it is not anticipated that any significant polluting discharges will be discharged from these sites under normal circumstances. It is therefore deemed there will be no significant, cumulative effect upon aquatic ecology as a result of stormwater discharges from Metal Processors site in combination with these other sites in the estate. Given the redirection of first flush stormwater generated on-site to foul sewer, it is anticipated there will be a slight to moderate positive effect on receiving waters and aquatic ecology as a result of the proposal.

8.8.2 Indirect Impacts

No indirect impacts upon the water quality or status of surface water surrounding or hydrologically connected to the site have been identified.

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9. Air and Climate

9.1 Introduction

Metal Processors proposes on initiating a Review of their Industrial Emissions Licence with the EPA. This Review is prompted by the need to revise the licence in light of the introduction of new Best Available Techniques Conclusions (BAT-C) for the non-ferrous metal industry for preventing or minimising emissions and impacts on the environment (Commission Implementing Decision (EU) 2016/1032). The licence review also serves to accommodate the creation of a new emission point to foul sewer associated with the development of a dual flow drainage system. Metal Processors do not propose on altering production processes on-site which may give rise to process emissions or fugitive dust emissions.

This chapter describes and characterizes the existing air environment in the vicinity of the Metal Processors facility and assesses the impact the proposed activity will have upon the receiving air environment. It also assesses climate conditions associated with the region and evaluates the potential impacts the proposed activity will have on climate conditions.

9.2 Assessment Methodology

The following steps were completed in order to assess the impacts of the proposed activity upon the Air Environment and Climate:

1. Review of Ambient Air Quality Data for the local area as recorded by the EPA's National Ambient Air Quality Network.
2. Identification and characterization of significant substances which will be released to air as a result of the proposed activity.
3. Carrying out of Air Dispersion Modelling (using AERMOD View) to determine the impact process emissions will have on ambient air quality.
4. Assessment of fugitive dust emissions associated with the proposed activity through the carrying out of Bergerhoff Dust Monitoring at site boundary locations.
5. An evaluation of the potential impacts the proposed activity could have on the air environment and climate.

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9.2.1 Assessment Criteria

The following National Ambient Air Quality Standards were referred to when evaluating the impact of Particulate and Lead emissions associated with Smelting/Refining Processes at the facility (from emission point AE-1).

Table 9-1 National Air Quality Standards for Particulates (as PM_{10}) and Lead

Parameter	Averaging Period	Limit Value ug/m3	Criteria
Particulates (as PM_{10})	24 hours	50	Not to be exceeded more than 35 times in a calendar year
	Calendar year	40	Annual mean
Lead	Calendar year	0.5	Annual Mean

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The following BAT associated emissions levels for dust and lead emissions to air from Lead Manufacturing Processes were referred to when evaluating the impact point source air emissions from emission point AE-1 will have upon ambient air quality.

Table 9-2 BAT-associated emission levels for dust and lead emissions to air (other than those that are routed to the sulphuric acid or liquid SO2 plant) from charging, smelting and tapping in primary and secondary lead and/or tin production

Parameter	BAT-AEL (mg/Nm3)
Dust	2 - 4
Lead	1

Note: Dust emissions are expected to be towards the lower end of the range when emissions are above the following levels: 1 mg/Nm3 for copper, 1 mg/Nm3 for antimony, 0.05 mg/Nm3 for arsenic, 0.05 mg/Nm3 for cadmium.

Table 9-3 BAT-associated emission levels for dust and lead emissions to air from remelting, refining and casting in primary and secondary lead and/or tin production

Parameter	BAT-AEL (mg/Nm3)
Dust	2 - 4
Lead	1

Note: Dust emissions are expected to be towards the lower end of the range when emissions are above the following levels: 1 mg/Nm3 for copper, 1 mg/Nm3 for antimony, 0.05 mg/Nm3 for arsenic, 0.05 mg/Nm3 for cadmium.

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There were no limits prescribed for the facility in any previous planning permission or under the existing Industrial Emissions Licence. The EPA Best Practice Total Dust Deposition Limit of 350 mg/m^2/day was therefore referenced when evaluating the impact of fugitive dust associated with the proposed activity.

9.3 Baseline Environment

9.3.1 Site Location

The subject facility is situated at Station Road, Clondalkin Industrial Estate, Clondalkin. The terrain surrounding the site is generally flat and low-lying with an elevation of around 60 O.D. The site is immediately surrounded on all sides by other commercial and industrial premises. Land use in the broader local area is mixed use with residential estates located north, west and south/south-west of the facility. The road network includes the M50 to the east, the Nangor Road to the south, the Newlands Road to the west and Cloverhill Road to the north. The Dublin to Cork Railway Line traverses directly north of the site boundary.

A number of other industrial activities in the local area give rise to emissions to air. Hammond Lane's Scrap Metal Recycling facility situated approximately 290 metres east of the site in Clondalkin Industrial Estate may give rise to fugitive dust emissions. Greyhound Household Recycling's Waste Management Centre situated in Clondalkin Industrial Estate approximately 450 metres east of the site may give rise to fugitive dust emissions and methanol from the operation of a biodiesel production plant. Emissions from road traffic on the M50 and on surrounding roads, as well emissions from diesel trains using the railway line to the north of the site will contribute to background levels of CO, NOx and PM10 in the locality.

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There are no residential dwellings in close proximity of the site. The nearest house is situated approximately 115 metres south-west of the site at the corner of James Connolly Park housing estate. Residential dwellings can also be found on Station Road to the south west of the site, Ballymanaggin Lane to the south of the site and in Raheen to the north west of the site. It is noted that a parcel of land north-west of the site on the Cloverhill Road has received planning permission for the development of houses and apartments (Planning Ref: SD17A/0397), therefore potential exists for new housing to be located here.

9.3.2 Meteorological Conditions

The proposed activity will exist within the context of a temperate, maritime Irish climate, characterized by mild temperatures and wet weather. The weather in the region is influenced by the Irish Sea, resulting in mild, moist weather dominated by cool air masses.

The nearest weather station to the site is the Met Eireann weather station at Casement Aerodrome which lies ca. 5 km to the south west of the site. The 30 year averages for meteorological data from the station at Casement Aerodrome are shown in the table below.

Table 9-4 30 year averages for meteorological data from Met Eireann's Casement Aerodrome Weather Station

Parameter	30 Year Average
Mean Temperature (Degrees Celsius)	9.7
Mean relative Humidity at 0900UTC (%)	83.6
Mean daily sunshine hours (Hours)	3.7
Mean monthly total rainfall (mm)	754.2
Mean wind speeds (knots)	10.7

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The prevailing wind direction in the area is from the southwest, as presented in the wind rose for Casement Aerodrome in Figure 9-1.

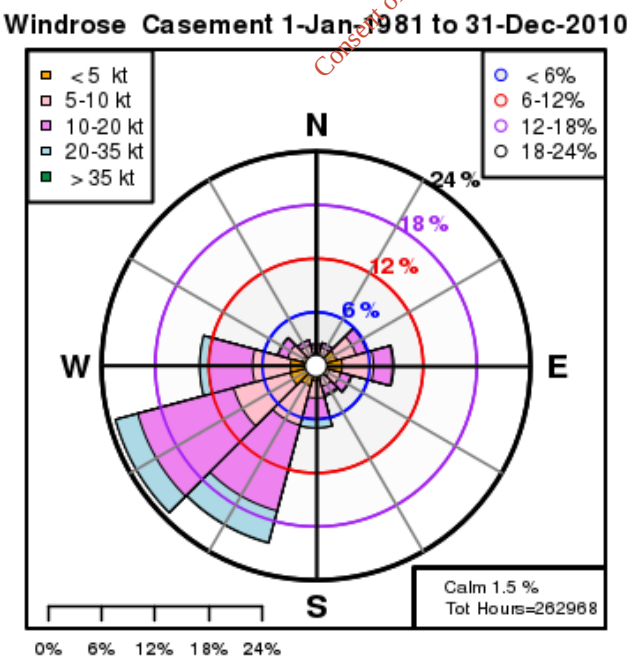

Figure 9-1 Windrose for Casement Aerodrome 1981 – 2010

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These are relatively warm winds from the Atlantic and frequently bring rain. Easterly winds are weaker and less frequent and tend to bring cooler weather from the north east in spring and warmer weather from the south east in summer. Wind characteristics vary between a moderate breeze to gales (average of 18.1 gales per annum). Monthly average wind speeds range from 8.6 to 13.6 knots with highest winds occurring during winter and spring and lowest wind speeds occurring during summer.

9.3.3 Air Quality Zone

Air quality zones have been established in Ireland by the EPA in accordance with the Clean Air for Europe Directive. European air quality legislation requires that each member state be defined in terms of Zones and Agglomerations for air quality, with Ireland divided into four zones. Dublin Conurbation is one zone – Zone A and Cork Conurbation is defined as Zone B. Zone C consists of 24 cities and towns (such as Galway, Limerick and Waterford cities and towns such as Naas, Newbridge, Celbridge, Leixlip) with a population of greater than 15,000 while Zone D covers the remainder of the country. The applicant's site is situated in the Dublin Conurbation, Zone A. This zone is distinctly urban in nature and is characterized as being significantly influenced by human activity such as industry and transport.

9.3.4 Ambient Air Quality

The EPA has established an ambient air quality monitoring network in Ireland. Baseline ambient air quality data for the region is available. Annual Mean Values for $PM_{2.5}$, PM_{10}, NO_2, NO_X, SO_2, CO and Lead are presented in Table 9-5. No annual mean value for any parameter exceeded relevant Annual Mean Limits prescribed in the Air Quality Standards Regulations.

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Table 9-5 Baseline Ambient Air Quality Data 2017

Parameter	Unit	Annual Mean	Annual Mean Limit	Monitoring Station[4]	Comments
Particulate Matter as $PM_{2.5}$	µg/m3	8.5	25	Rathmines	Summary statistics for daily $PM_{2.5}$ concentrations
Particulate Matter as PM_{10}	µg/m3	12	40	Ballyfermot	Summary statistics for daily PM_{10} concentrations
Nitrogen dioxide NO_2	µg/m3	16.5	40	Ballyfermot	Summary statistics for hourly NO_2 concentrations
Nitrogen oxides NO_X	µg/m3	20.7	-	Ballyfermot	Summary statistics for hourly NO_x concentrations in
Sulphur dioxide SO_2	µg/m3	2.2	20	Tallaght	Summary statistics for hourly SO_2 concentrations in
Carbon monoxide CO	mg/m3	0.14	10	Winetavern Street	Summary statistics for rolling 8-hour CO concentrations
Lead	ng/m3	5.39	500	Rathmines	Summary statistics for monthly lead concentrations

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[4] The nearest monitoring station to the facility which tests for the parameter in question.

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9.3.5 Characteristics of Emissions

The existing manufacturing activity occurring at the applicant's site gives rise to the following types of emissions to air:

- Point source emissions to air (at Emission Point Ref AE-1) from smelting and refining processes (as discussed in Section 4.9.1).
- Fugitive dust emissions from the storage, handling and processing of incoming materials (as discussed in Section 4.9.2), and from moulding and casting processes.
- Vehicle exhaust emissions; emissions from Heavy Goods Vehicles transporting materials to and from the site and emissions from forklift trucks transporting materials around the site.

Past and recent process emission and fugitive dust emission monitoring results are detailed in the sections below.

9.3.5.1 Past Process Emission Monitoring Results

The applicant is required to carry out monitoring of emissions to air from smelting and refining processes at its facility under Schedule 1 of its existing Industrial Emissions Licence. Exhaust emissions from smelting and refining operations are directed via duct channels to a pollution abatement system before being discharged via a 40 metre high stack (Emission Point AE-1). Historic air monitoring results for emission point AE-1 are shown in Table 9-6 below.

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Table 9-6 Past Process Emission Monitoring Results at Emission Point AE-1[5]

Parameter	Unit[6]	B1 2016	B2 2016	B1 2017	B2 2017	B1 2018	B2 2018	Limit
Particulate Matter	mg/Nm³	1.3	1.72	2.33	1.48	2.51	1.45	10
Lead	mg/Nm³	0.0058	0.0068	0.0095	0.0130	0.2890	0.0257	2
Copper	mg/Nm³	0.0015	0.0021	0.0016	0.0011	0.0035	0.0016	5
Zinc	mg/Nm³	0.0094	0.015	0.064	0.0191	0.0466	0.1148	5
Arsenic	mg/Nm³	0.0005	0.0003	0.0004	0.0005	0.0008	0.0005	1
Tin	mg/Nm³	0.0004	0.0003	0.0005	0.0004	0.0064	0.0012	5
Nickel	mg/Nm³	0.0012	0.0019	0.0014	0.0012	0.0027	0.0036	5
Cadmium	mg/Nm³	0.0005	0.0004	0.0004	0.0005	0.0004	0.0008	0.5
Antimony	mg/Nm³	0.0007	0.0004	0.0003	0.0006	0.007	0.0007	2
Volume Flow	Nm³/hr	16,495	12,774	15,065	13,617	15,753	15,950	34,000

[5] These results are subject to uncertainty of measurement.
[6] Reference conditions are 273K, 101.3kPa, dry gas.

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9.3.5.2 Dust Monitoring Results

Bergerhoff dust monitoring was carried out over a number of months in order to ascertain existing fugitive dust deposition levels on-site. Four dust monitoring points were identified at boundary locations on-site. These monitoring points are shown in Figure 9-2. A summary of dust monitoring results recorded at these locations is shown in Table 9-7.

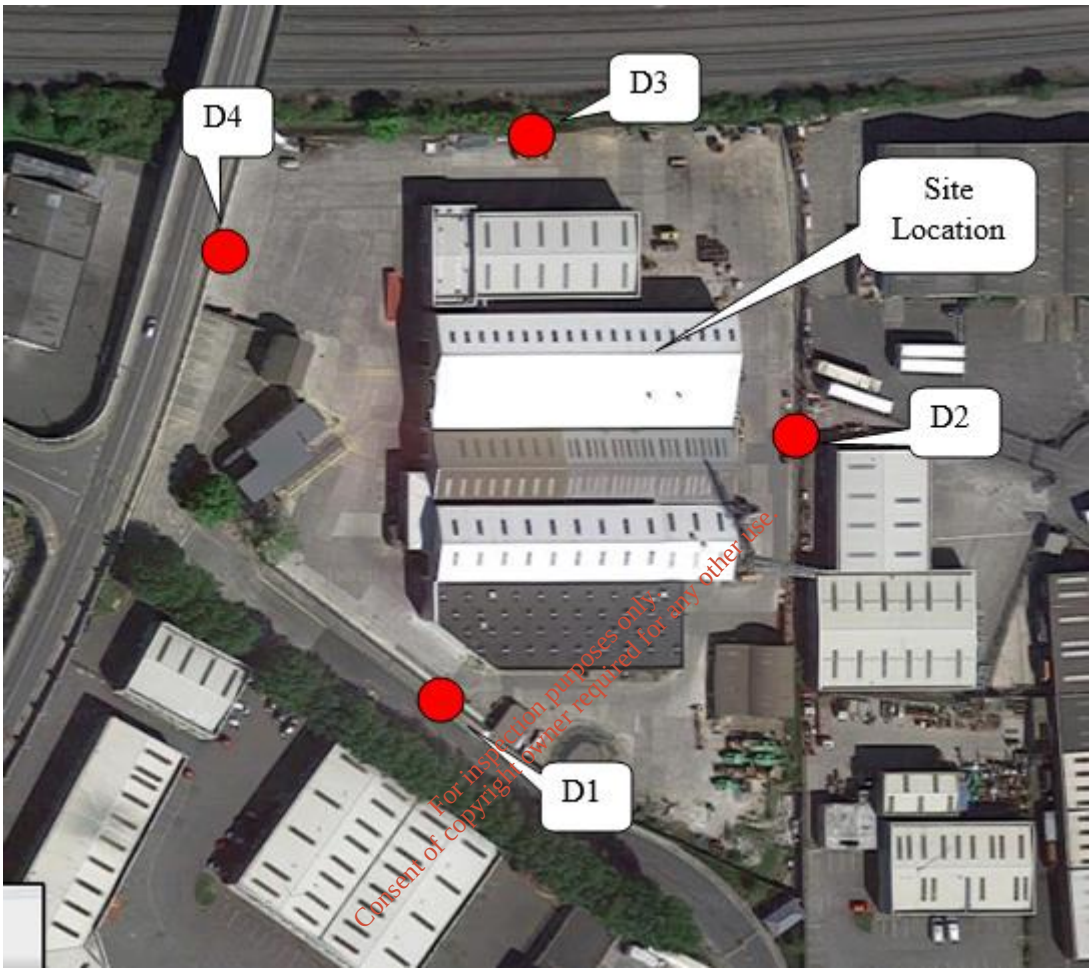

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Figure 9-2 Dust Monitoring Locations

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Table 9-7 Dust Monitoring Results

Emission Point	Date Installed	Date Removed	Date of Analysis	Dust Deposition mg/m2/day	EPA Dust Limit Value
D1	16/10/2018	15/11/2018	27/11/2018	10.9	350
D2	16/10/2018	15/11/2018	27/11/2018	23.4	350
D3	16/10/2018	15/11/2018	27/11/2018	17.9	350
D4	16/10/2018	15/11/2018	27/11/2018	63.1	350
D1	15/11/2018	13/12/2018	07/01/2019	12.3	350
D2	15/11/2018	13/12/2018	07/01/2019	11.2	350
D3	15/11/2018	13/12/2018	07/01/2019	21.2	350
D4	15/11/2018	13/12/2018	07/01/2019	24	350
D1	13/12/2018	11/01/2019	18/01/2019	51.5	350
D2	13/12/2018	11/01/2019	18/01/2019	27.7	350
D3	13/12/2018	11/01/2019	18/01/2019	18	350
D4	13/12/2018	11/01/2019	18/01/2019	24.2	350

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9.3.5.3 Substances of Interest

Particulates, metals and metal compounds are produced during melting processes on-site. TVOC's and Dioxins are not expected to be produced during melting as scrap material accepted on-site is not expected to be contaminated with oils or plastics.

Fugitive metal dust will also be generated during the transport, handling and storage of materials and moulding and casting processes.

The operation of gas burners on-site will result in the production of oxides of sulphur and nitrogen and carbon dioxide, while incomplete combustion may release carbon monoxide. These emission points are considered minor in nature however given the size of the gas burners. It is not expected that these emission points will give rise to air emissions of significance given their minor nature.

As such, the main emissions of interest associated with the proposed activity are as follows:

- Particulate Matter
- Lead and other Heavy metals

These substances and the risk they pose to ambient air quality and human health are discussed in detail below.

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9.3.5.3.1 Particulate Matter

Particulate Matter is the term for a mixture of solid particles and liquid droplets found in the air. Particle pollution includes:

- PM_{10} : inhalable particles, with diameters that are generally 10 µm and smaller; and
- $PM_{2.5}$: fine inhalable particles, with diameters that are generally 2.5 µm and smaller.

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some are emitted directly from a source, such as construction sites, unpaved roads, industrial stacks or fires. Most particles form in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries and automobiles.

Particulate matter contains microscopic solids or liquid droplets that are so small that they can be inhaled and cause serious health problems. Some particles less than 10 µm in diameter can get deep into your lungs and some may even get into your bloodstream. Of these, particles less than 2.5 µm in diameter, also known as fine particles or $PM_{2.5}$, pose the greatest risk to health.

9.3.5.3.2 Lead and Other Heavy Metals

The main heavy metal of concern is lead. The main sources of lead in the air are from metals processing and petrol engine exhaust emissions. The highest air concentrations of lead are usually found near lead smelters. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the blood. The introduction of unleaded petrol has dramatically reduced emissions. Levels are now very low in Ireland.

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Other Heavy Metals of concern which may arise during melting processes on-site include Copper, Zinc, Arsenic, Tin, Nickel, Cadmium and Antimony. These Heavy Metals are dense metals which are toxic at low concentrations. Typical sources include; metal processing, fuel combustion and waste incineration, among other industrial processes. Broadly, exposure to toxic heavy metals can have carcinogenic, central and peripheral nervous system, respiratory and circulatory effects.

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9.4 Impact Assessment

9.4.1 Construction Phase Impacts

The construction of the dual flow drainage system on-site will involve some concrete breaking, excavation works and construction works. It is expected that such construction activities will give rise to dust emissions. Given that construction activities will be limited in scale and duration, temporary and intermittent in nature and given construction works will be taking place at a location on-site that is a considerable distance away from any sensitive receptor, it is not anticipated they will give rise to significant noise and dust impacts upon sensitive receptors.

There is potential for construction phase activities to have a negative, slight, short term impact upon commercial premises in close proximity. As such, mitigation measures should be put in place to minimize localized dust impacts.

Construction vehicles etc., will give rise to some CO2 and NO2 emissions. However, due to the limited scale of the project and the short-term and temporary nature of these works the impact on climate will not be significant.

9.4.2 Operational Phase Impacts

9.4.2.1 Process Emissions

Exhaust emissions from smelting and refining processes on-site are channelled through ducting towards and an air abatement system consisting of a cooling tower system, an air cyclone system and baghouse filters, before being discharged via a 40 metre stack known under the applicant's existing IED licence as emission point AE-1. A summary of past stack emissions monitoring is shown in Table 9-6. It can been from this table that, historically, stack emissions via emission point AE-1 have not caused an exceedance of any emission limit value for this emission point prescribed by the EPA in Schedule 1 of the applicants existing licence.

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As there are no proposed changes to smelting/refining processes on-site under this Licence Review, it is expected that the characteristics of emissions from AE-1 will remain closely similar to before. As such, it is not expected that there will any significant increase if the concentration of pollutants or volume flows emitted from this stack.

It is noted that new Best Available Techniques Conclusions (BAT-C) for the non-ferrous metal industry for preventing or minimising emissions and impacts on the environment. (Commission Implementing Decision (EU) 2016/1032) prescribe new emission limit values for dust and lead emissions to air from smelting and refining operations. These limits are detailed in Table 9-2 and Table 9-3. A comparison between historic stack emission monitoring results and the new emission limit values for lead and dust (particulate matter) is shown in the table below:

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Table 9-8 Historic lead and dust results Vs new BAT ELV

Parameter	Unit[7]	B1 2016	B2 2016	B1 2017	B2 2017	B1 2018	B2 2018	BAT ELV
Particulate Matter	mg/Nm³	1.3	1.72	2.33	1.48	2.51	1.45	2-4
Lead	mg/Nm³	0.0058	0.0068	0.0095	0.0130	0.289	0.0257	1

As can be seen from the table above, past lead emissions from AE-1 fall well under the new BAT ELV for lead. For the most part, particulate matter emissions from AE-1 fall below the emission limit value ranges prescribed for dust. It is noted that particulate matter concentrations recorded during Biannual 1 2017 and Biannual 1 2018 monitoring at AE-1 would of exceeded the lower end of the new ELV range for dust. When considered together however, on average, particulate matter results fall below the lower threshold. It is noted that BAT Conclusion Guidance states that Particulate Matter emissions '*are expected to be toward the lower end of the range of the BAT ELV when emissions are above the following levels: 1 mg/Nm3 for copper, 1 mg/Nm3 for antimony, 0.05 mg/NM3 for arsenic, 0.05 mg/Nm3 for cadmium*.' A review of historic monitoring results at AE-1 shows that the concentration of these parameters are routinely far below these thresholds. As such, it is more appropriate to compare particulate matter results with the higher BAT ELV for particulate matter of 4 mg/Nm3. All historic particulate matter results recorded are significantly below the higher 4 mg/Nm3 limit.

Considering past monitoring results at AE-1, as well as the new BAT ELV's for dust and lead emissions from smelting and refining, it is deemed that emissions to air from AE-1 would not likely cause a breach of any existing or new ELV and therefore would not have a significant, adverse impact upon local ambient air quality or human health.

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In order to further verify that stack emissions associated with the proposed activity will not have an adverse impact upon local ambient air quality, an air dispersion model has been carried out to determine whether emissions from AE-1 will cause a breach of ambient air quality standards for particulate matter and lead. This air dispersion model is detailed in Appendix 11. Air dispersion modelling has concluded that emissions from AE-1 will have a negligible impact upon ambient air quality and that ambient air quality standards for particulate matter and lead will not be exceeded as a result of these emissions.

9.4.2.2 Fugitive Dust Emissions

Diffuse dust emission can arise on-site due to the storage, handling and processing of incoming materials. Baseline dust monitoring over three months was undertaken at site boundary locations to determine current dust deposition levels on-site. As there are no proposed changes to operational processes on-site under this Licence Review, it is expected, in the absence of any further mitigation measures or operational changes, that dust deposition levels will remain similar to before. These dust monitoring results are detailed in Table 9-7.

Total Dust levels recorded fell significantly below the dust deposition limit of 350 mg/m2/day prescribed in the German TA Luft Regulations and often prescribed by the EPA when setting dust deposition limits for industrial and waste activities.

[7] Reference conditions are 273K, 101.3kPa, dry gas.

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Given these monitoring results and given there are no sensitive receptors in close proximity to the site, it is anticipated there will no adverse dust impact upon sensitive receptors associated with the proposed activity.

9.4.2.3 Traffic Emissions

As there are no proposals to significantly change site activities or operational processes on-site, it is not anticipated that traffic levels associated with the facility will increase. It is expected that traffic levels associated with site activities, to and from the site, as well as around the site, will remain similar to what they have been before. Given the level of vehicle activity associated with the proposed activity it is not envisaged that emissions to air from the operation of vehicle will have a significant impact on air quality.

9.5 Mitigation Measures

9.5.1 Construction Phase Mitigation Measures

The following mitigation measures shall be implemented during the construction phase:

- Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned using a roadsweeper as necessary.
- Skips (used for storing excavated materials) will be designed and laid out to minimise exposure to wind. Skips will be covered with tarpaulin. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Hoarding will be provided around the construction site to minimize dust exposure.
- In the event of dust nuisance occurring outside the site boundary, works or movements of materials raising dust shall be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.
- Construction areas and access route will be regularly swept using a roadsweeper.

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9.5.2 Operational Phase Mitigation Measures

In order to ensure process emissions from emission point AE-1 are adequately controlled and minimized these emissions will pass through an air pollution abatement system which will consist of a cyclone filter and a series of bag-house filters, before being discharged to ambient air via a 40 m high stack.

The following mitigation measures will be implemented to ensure fugitive dust emissions are adequately controlled and minimized.

- All raw material, intermediates and finished product will be stored indoors and processing operations (smelting/refining, milling and metal working activities) will take place indoors. All trucks will be off-loaded at the Material Intake Store inside Building D to reduce dust emissions.
- A roadsweeper will clean the yard area on a weekly basis to minimize the amount of dust that can be generated in the yard.
- A water spray will be used during loading of scrap lead into hopper/conveyor belt to suppress lead dust in the refining area.
- Internal floors in processing areas in the Refining Area, Engineering Works Area and Milling Area will be cleaned using a vacuum sweeper on a daily basis.
- Water misters will be used during offloading of incoming raw materials to dampen down dust in the Material Intake Store
- It is proposed to install fast acting roller doors in the Refinery in order to minimize fugitive dust emissions from this area.

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9.6 Residual Impacts

With the adoption of the mitigation measures detailed above, it is not anticipated that there will be any significant environmental impact upon ambient air quality or sensitive receptors as a result of the proposed activity.

9.6.1 Cumulative Impacts

Air emissions from the facility, when combined with air emissions from surrounding existing development including commercial and industrial facilities and road and rail traffic, could potentially cause a deterioration of ambient air quality. Baseline ambient air quality data for the region, which could be affected by emissions from the existing facility and existing development in the region shows that the annual mean value limits for PM2.5, PM10, NO2, NOX, SO2, CO and Lead, as prescribed in Air Quality Standards Regulations have not been exceeded. As such, it can be seen facility air emissions, in combination with air emissions from surrounding sources are not having a significant cumulative impact on air ambient air quality. There are no proposals to change operational processes on-site in a manner that would materially affect air emissions from the facility under the IE Licence Review.

There is no further proposed development in the local area which would lead to a significant increase in air emissions affecting ambient air quality.

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9.6.2 Indirect Impact

It is not anticipated that there will be any indirect adverse impact on the ambient air environment as a result of the proposed activity.

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10. Noise

10.1 Introduction

Environmental Efficiency were commissioned by the applicant to assess noise impacts associated with the proposed activity based in Clondalkin Industrial Estate at Station Road, Clondalkin, Dublin 22. The purpose of this assessment was to determine the impact construction and operational phase noise, associated with the proposed activity, would have on sensitive receptors surrounding the site.

Vibration impacts have not been assessed as it was determined in the EIA Scoping Assessment that it was not likely plant and equipment on-site will create airborne or ground borne vibration that could affect sensitive receptors due to the proximity of these receptors to where proposed development activities will be taking place.

10.2 Assessment Methodology

10.2.1 Characterization of the Baseline Environment

The following steps were taken in order to accurately characterize the baseline environment in terms of noise:

- An evaluation of the site setting and surroundings, involving a desk based review of local area mapping and aerial photography and a site and local area walkover survey.
- A desk based review of past noise monitoring carried out for the facility under its existing Industrial Emission Licence (Licence Ref: P0401-01)
- Additional baseline noise monitoring carried out at existing and potential Noise Sensitive Locations (NSL's) during day and night time hours

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10.2.2 Assessment of Construction Phase Impacts

The Structural Engineers responsible for the design of the Dual Flow Drainage Proposal to be constructed on-site were consulted in order to determine the construction processes involved in the development of the dual flow drainage system. Once construction processes and timescales were identified a Qualitative Assessment was carried out to evaluate the potential impacts construction processes would have on sensitive receptors.

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10.2.3 Assessment of Operational Phase Impacts

As there are no proposals to materially change facility operations and processes, noise sources, and emissions emanating from the facility, will remain closely similar. As such it was deemed appropriate to assess noise impacts on NSL's using methods prescribed in British Standard *BS 4142:2014 Methods for rating and assessing industrial and commercial sound.*

Existing noise emissions from the facility, which were predicted to be representative of emissions associated with the proposed activity going forward, were assessed and compared to background noise levels, in the absence of operational noise, in order determine whether predicted noise emanating from the facility would adversely affect NSL's. This form of assessment was carried out at existing and potential NSL's in the vicinity of the site during day and night time periods.

This BS4142:2014 Assessment Report is contained in Appendix 12.

10.2.4 Criteria for Assessment of Noise Impacts and Determination of Significance

Noise impacts associated with Metal Processors manufacturing activity were assessed with reference to criteria prescribed within *BS 4142:2014 Methods for rating and assessing industrial and commercial sound.*

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A noise survey, which assessed operational noise emanating from Metal Processors site, was carried out. The following measurements, which are prescribed in BS4142: 2014, were taken.

1. The Ambient Noise Level (L_{eqt}): This is measured noise on site and is a combination of the specific noise source of interest and all other surrounding sources
2. The Residual Noise Level (L_{eqt}): This is the noise level measured on site in the absence of the specific noise source of interest.
3. The Background noise level (L_{90}): This is the noise level measured on site for 90% of the time during the Residual Noise Measurement, known as the L90.

The following was then determined using BS4142: 2014 methods:

4. Specific Noise: This is residual noise levels subtracted from the ambient noise (i.e. site noise)
5. Rated Noise: A +6 dB penalty is added to Specific Noise if tonal or impulsive noise is present or if the noise is irregular enough to attract attention

Following determination of the above measures, the final step is to determine the difference between the Rating Level and the Background Level. The following criteria are then applied.

- Where Rated Noise exceed Background Noise by greater than 10 dB there is an indication of a significant adverse Impact.
- Where Rated Noise exceed Background Noise by greater than 5 dB there is an indication of an adverse Impact.
- The lower the rated level is relative to the background level, the less likely it is that the specific noise level will result in adverse impact.

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10.2.5 Definitions

The following definitions apply throughout this Chapter of the EIAR.

Table 10-1 Noise Terminology

Noise Monitoring Parameters	
Survey	The measurement of noise over one or more days and is made up of a number of monitoring runs with one or more noise meters.
Run or monitoring run	A single measurement at one location to determine noise level. A number of monitoring runs will be typically be made at each location. The duration of a monitoring run is typically 15 or 30 minutes and is stipulated in the licence.
dB(A)	This is the unit used to quantify noise measurements. "dB" stands for decibel and the "A" indicates that the noise reading is A-weighted and therefore is a measurement of noise audible to the human ear. The scale is logarithmic.
$L_{Aeq,T}$	This parameter is measured on-site using a noise meter for a specified time period (T minutes). It represents the average noise level that occurred over that period.
Rated Noise Level or $L_{Ar,T}$	The Rated Noise Level is equal to $L_{Aeq,T}$ plus any penalty for confirmed tonal and/or subjective impulsive. The penalty is only added for daytime and evening monitoring.
L_{AF10} and L_{AF90}	The L_{AF10} and L_{AF900} are both statistical noise levels. L_{AF10} indicates that for 10% of the monitoring period, the sound levels were greater than the quoted value. L_{AF90} indicates that for 90% of the monitoring period, the sound levels were greater than the quoted value. The L_{AF90} indicates the background noise levels if short-term, intermittent noise sources were ignored e.g. a passing car. The L_{AF10} can be used to determine the effect to which these short-term noise sources effect the overall average reading i.e. if the L_{AF10} is very different to the L_{AF90}, then intermittent noise is a significant source of noise
L_{AFmax}	The maximum RMS A-weighted sound pressure level occurring within a specified time period. Measured using the “Fast” time weighting.
Continuous	Noise produced without interruption.
Impulsive Noise	A noise of short duration (typically less than one second), the sound pressure of which is significantly higher than the background; brief and abrupt.
Intermittent Noise	Noise produced on discontinuous basis e.g. equipment operating in cycles or events such as single passing vehicle or aircraft.
Tonal Noise	Noise, which contains a clearly audible, tone i.e. a distinguishable, discrete or continuous note (whine, hum, drone, screech, etc.).

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10.3 Baseline Environment

10.3.1 Site Description

The site is approximately 1.85 hectares in size. The site consists of a number of administrative, warehousing and industrial buildings. Buildings housing production activities are located centrally on-site and are surrounded by a large concrete yard area

10.3.2 Description of the Local Environment

The site is situated in Clondalkin Industrial Estate and is surrounded on all sides by other commercial and industrial facilities, including plant hire companies, haulage companies, auto repair companies and wholesalers.

The nearest housing is situated to the south west of the site on Station Road and at James Connolly Park housing estate.

The Dublin to Cork train line runs along the northern boundary of the site.

Several major roadways which carry substantial volumes of traffic exist in the vicinity of the site. The road network surrounding the site includes the M50 to the east, the Nangor Road to the south, the Newlands Road to the west and Cloverhill Road to the north.

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10.3.3 Description of NSL's

Two Noise Sensitive Location were identified within the vicinity of the site. These have been labelled NSL6 and NSL7.

NSL6 is located 115 metres to the south west of the site at the junction between Station Road and Cloverhill Road. This NSL is representative of a cluster of houses situated to the south east of the site on Station Road, Crag Avenue and at the corner of James Connolly Park Industrial Estate.

NSL7 is situated 65 metres to the north-west of the site on Cloverhill Road. NSL7 is classed as a potential NSL and currently consists of a brownfield site that is zoned for residential development. Planning Permission (Ref: SD17A/0397) has been granted for 85 dwellings comprising 65 houses and 20 apartments at this site.

A map showing the location of these NSL's is shown in Figure 10-1.

Commercial premises in the vicinity of Metal Processors site are not deemed to be NSL's given that the nature of their operations (e.g. vehicle repair, storage and distribution, retail). It is noted that an NSL is defined in the EPA's Noise Guidance Document (NG4) as any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels. No commercial premises in the vicinity of the site can be defined as an NSL, given this definition.

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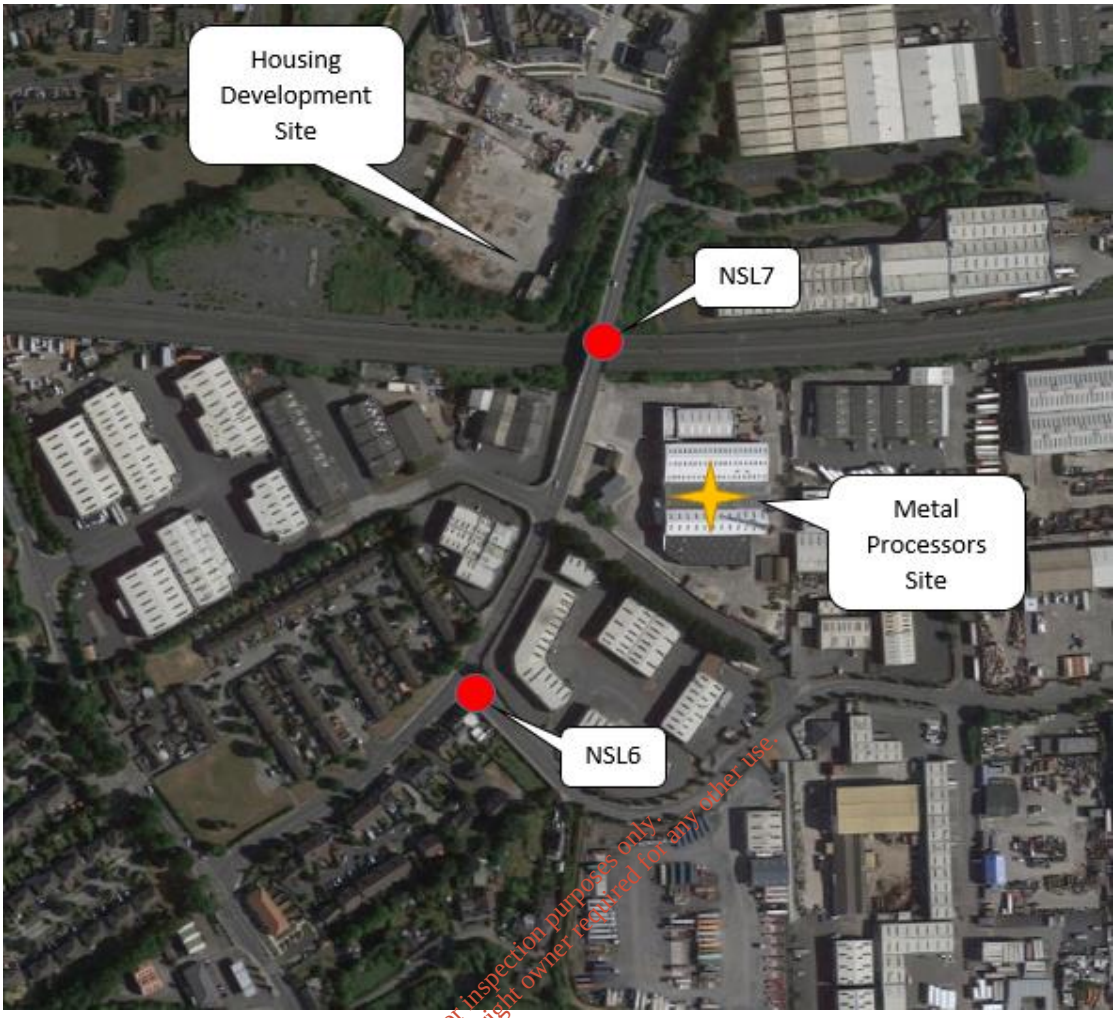

Figure 10-1 Noise Sensitive Locations

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10.3.4 Existing Noise Sources

10.3.4.1 On-site Noise Sources

A review of the BS4142: 2014 assessment report adjoining this EIAR (See Appendix 12), a previous Environmental Noise Assessment Report carried out for the site (See Appendix 13), as well as historic noise monitoring reports completed for the existing licensed facility, was carried out to determine on-site noise sources that are audible off-site. The following on-site noise sources were identified:

- Site compressors
- Extractor fans
- Baghouse system
- Conveyors
- Forklift movements
- HGV movements

10.3.4.2 Off-site Noise Sources

The following primary off-site noise sources were identified having reviewed noise assessment/monitoring reports for the site:

- Traffic on Station Road/Cloverhill Road
- Traffic on Crag Avenue
- Passing trains on the Dublin to Cork Railway Line
- Vehicle movements on nearby commercial sites
- Works taking place on nearby commercial sites
- Industrial noise emanating from industrial units opposite the Dublin to Cork railway line in Cloverhill Industrial Estate.

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10.3.5 Baseline Noise Levels

10.3.5.1 Historic Noise Monitoring

Noise monitoring is conducted on an annual basis at the site in accordance with the terms of Metal Processors existing licence. Monitoring is carried out at five boundary locations and one NSL located at a cluster of houses to the south west of the site (NSL6).

The following Conditions are stipulated in Metal Processors current licence with regards to noise:

Condition 7. Noise

7.1 Activities on-site shall not give rise to noise levels off site, at any noise sensitive locations, which exceed the following sound pressure limits (Leq,15mins) subject to Condition 3 of this licence:

7.1.1 Daytime: 55 dB(A)

7.1.2 Night-time: 45 dB(A).

7.2 There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.

Figure 10-2 Noise Limits prescribed in Existing Licence

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Historic noise monitoring from the years 2015 to 2018 carried out by Socotec has been reviewed. Past noise monitoring results show that day-time noise limits of 55 dB and night-time noise limits of 45 dB are typically exceeded at noise boundary location (N1-N5) and NSL6. Noise limit exceedances at monitoring locations have been attributed to off-site noise sources such as traffic and passing trains however. Noise from the site was not audible at NSL6. In addition, no tonal or impulsive noise has been identified at the NSL. As such, Metal Processors have been compliant with the conditions regarding noise prescribed in its current licence.

10.3.5.2 Additional Baseline Noise Monitoring

Additional Baseline Monitoring was carried out at NSL6 and NSL7 on 02/05/2018, 22/01/2019 and 23/01/2019. Day-time and night-time monitoring was undertaken over these time periods. A summary of the additional baseline monitoring undertaken is shown in the table below.

Table 10-2 Additional Baseline Monitoring at NSL6 & NSL7

	NSL6 (Day-time)	NSL6 Night-(time)	NSL7 (Day-time)	NSL7 Night-(time)
Date	02/05/2018	23/01/19	22/01/19	23/01/19
Time	12:28	06:19	13:47	06:39
Duration (mins)	60	15	60	15
Ambient noise level $LA_{eq(t)}$, dB	68.5	67.9	59.2	58.4

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Noise levels exceeded relevant noise limits during each noise monitoring run. It was determined by the noise assessor however that that no audible site noise emanating from Metal Processors could be heard at either NSL during the day or the night.

The above monitoring results are contained in the BS4142:2014 Assessment Report adjoining this EIAR (See Appendix 12). Noise monitoring results for NSL6 during the day-time were sourced from a previous Environmental Noise Assessment Report carried out for the facility (See Appendix 13).

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10.4 Impact Assessment

10.4.1 Construction Phase Noise Impacts

The construction of the dual flow drainage system on-site will involve some concrete breaking, excavation works and construction works. It is expected that such construction activities will give rise to noise emissions. Given that construction activities will be limited in scale and duration, temporary and intermittent in nature and given construction works will be taking place at a location on-site that is a considerable distance away from any sensitive receptor, it is not anticipated they will give rise to significant noise impacts upon sensitive receptors. In addition, construction operations shall only be carried out during designated construction operating hours, which are proposed to be as follows:

- Monday to Friday: 8 a.m. to 7 p.m.
- Saturdays: 8 a.m. to 2 p.m.

Concrete breaking may give rise to local ground borne vibration, but this is unlikely to be of nuisance given the considerable distance to any sensitive receptor, and is unlikely to result in cosmetic or structural damage to buildings.

As is typical for a construction project such as this, it is anticipated there will be a very small number of truck movements associated with the construction works. This is determined to be negligible in terms of noise impact on the surrounding environment given the number of traffic movements expected and given the site is located in an industrial estate where there are significant numbers of HGV movements already.

Potential exists for construction processes having a short-term, slight, negative impact upon commercial premises in close proximity to the site. Mitigation measures will need to be implemented in order to control noise associated with construction activities.

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10.4.2 Operational Phase Noise Impacts

10.4.2.1 Sources of Operational Phase Noise

As there are no proposals to significantly alter processing operations on-site, operational noise emanating from the site will remain the same or closely similar as before. As such, it is considered that on-site noise sources listed in Section 10.3.4.1 will be representative of operational noise emanating from the facility.

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10.4.2.2 Noise Assessment in accordance with BS 4142: 2014

An assessment of industrial noise emanating from the site was carried out using BS4142: 2014 methods. This assessment considered noise impacts on NSL's 6 and 7. A separate assessment report was developed, which details in more detail the methodology employed, the equipment used, noise survey personnel and monitoring conditions. This Assessment Report is contained in Appendix 12. A summary of the results of this report is shown in the table below.

Table 10-3 Summary of BS4142: 2014 Assessment

Noise Monitoring Location	Site activities noted	Difference of Rated noise level and the Background dB)	Comment
NSL6 (Day-time)	No audible site noise	-0.2	Significant variability in residual noise levels has resulted in the BS 4142 assessment having a large degree of uncertainty.
NSL6 (Night-time)	No audible site noise	+17.9	
NSL7 (Day-time)	No audible site noise	+5.1	
NSL7 (Night-time)	No audible site noise	+13.7	

Rated Noise levels were greater 10 dB louder than Background Noise levels at both NSL6 and 7 during the night-time, and greater than 5 dB louder than Background Noise levels at NSL 7 during the day-time. Although these results indicate that the manufacturing activity is having a significant adverse impact upon NSL's, it has been determined that is not the case. It was determined by the noise assessor that no audible site noise emanating from Metal Processors could be heard at either NSL during the day or the night. The dominant site noise at NSL6 was local traffic for both day and night. At NSL7, the dominant noise source was local traffic, industrial noise coming from the industrial units on the opposite of the rail line and also frequent trains during the day.

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10.4.2.3 Assessment of Operational Phase Noise Impacts

The BS4142: 2014 Assessment undertaken determined that existing Metal Processors manufacturing activities are having a negligible effect upon NSL's. As this is the case, and given there are no proposals to significantly alter processing operations under the Licence Review Application, it is considered that the continuation of metal processing activities on-site will continue to have a negligible impact upon NSL's in the vicinity of the site. Given that the site is surrounded by other commercial and industrial facilities, and given the presence of local noise in the form of road and rail traffic, it is not anticipated that the proposed activity will have a significant impact on the surrounding noise environment generally.

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10.5 Mitigation Measures

10.5.1 Construction Phase Mitigation Measures

The following mitigation measures will be implemented tin order to minimize noise impacts upon the receiving environment:

- Construction operations shall only be carried out during designated construction operating hours, which are proposed to be as follows:
  - Monday to Friday: 8 a.m. to 7 p.m.
  - Saturdays: 8 a.m. to 2 p.m.
- All contractors will ensure that the plant and construction methods employed are the quietest available for the required purpose insofar as practicable.
- Engines, vehicles and equipment will be switched off when not in use.
- Significant sources of noise will be enclosed by hoarding.
- Plant will be used and serviced regularly in accordance with manufacturer's instructions.
- Materials should be lowered, not dropped, insofar as practicable and safe.

10.5.2 Operational Phase Mitigation Measures

It is not necessary to establish further mitigation measures to control noise given that the proposed activity is expected to have a negligible impact upon sensitive receptors or the local noise environment generally. Mitigation measures which are already incorporated into the design of facility operations are detailed below:

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- Material loading and loading, and processing operations, namely lead manufacturing activities and metal working activities, will take place indoors, in order to reduce noise emissions emanating from the facility.
- Plant and equipment such as melting kettles, forklifts. Compressors and fans will be kept in good working order so as to minimize noise associated with the mechanical malfunction of plant and equipment. A Preventative Maintenance Programme will be in place at the facility.

10.6 Residual Impacts

It is considered that construction and operational phase noise associated with the proposed activity will have a negligible impact upon sensitive receptors and the surrounding environment generally once mitigation measures are implemented.

10.6.1 Cumulative Impacts

The site is situated in an area that can be characterized as urban and industrial in nature. It is not anticipated there will be any significant, adverse cumulative impacts on the baseline noise environment considering the existing nature of the area.

10.6.2 Indirect Impacts

It is not anticipated that there will be any significant, indirect impacts on the noise environment.

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11. Material Assets

11.1 Introduction

The Draft Advice Notes for Preparing Environmental Impact Statements produced by the EPA in September 2015 state that *"Resources that are valued and that are intrinsic to specific places are called 'material assets'. They may be of either human or natural origin".* This Chapter of the EIAR addresses how the proposed activity will have an impact upon material assets.

The purpose of the assessment is to ensure that the impact of the proposed activity on these material assets is assessed and mitigation measures are developed to control any likely significant adverse impacts on material assets as a result of the proposed activity. The overall aim of this assessment is to prevent adverse impacts upon material assets and ensure these assets retain their value and are available for present and future generations.

The effects of the proposed activity on material assets within the locality have been assessed under the following headings:

- Property
- Commercial and Industrial Development
- Traffic and Transportation Infrastructure
- Major Utilities (water, sewerage, power systems).
- Tourism and Recreational Infrastructure
- Assimilative Capacity of Water and Air
- Natural Resources

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11.2 Assessment Methodology

A walkover survey of the local area and a desk-top study were carried out to assess the baseline environment, material assets in the local area and the characteristics of the proposed activity on-site.

The walkover survey of the local area was carried out on 12/09/2018. The local and natural environment surrounding the subject site was surveyed.

The desk-top study consisted of a review of local area mapping, aerial photography and South Dublin County Council's Development Plan, followed by an evaluation of effects the proposed activity will have upon material assets in the local environment. The following guidance notes were referred to when completing this assessment:

- EPA's Guidelines on Information to be contained in EIAR's (2017) (Draft)
- EPA's Advice Notes for preparing Environmental Impact Statements (2015)

The above was carried out by a Senior Environmental/Planning Consultant with extensive experience completing Material Assets Chapters for EIAR's for a wide range of development types.

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11.3 Baseline Environment

11.3.1 The Site

The site, as described in Section 4, consists of an operational metal processing facility. The site is 1.85 ha in size. The site is surfaced in concrete slab. A number of administrative and industrial buildings are situated on-site.

Drainage from the site is currently treated via inline silt traps and a series of settlement tanks before being discharged to the public stormwater sewer serving the Clondalkin industrial Estate.

11.3.2 Property

The site is located in Clondalkin Industrial Estate. It is immediately surrounded by commercial and industrial sites in all directions.

The nearest residential dwellings to the site are situated in James Connolly Housing Estate and on Station Road to the south west of the site, Ballymanaggin Lane to the south of the site and in Raheen to the north west of the site. It is noted that a parcel of land north-west of the site on the Cloverhill Road has received planning permission for the development of houses and apartments (Planning Ref: SD17A/0397), therefore potential exists for new housing to be located here.

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11.3.3 Traffic and Transportation Infrastructure

The site is situated in Clondalkin Industrial Estate. Clondalkin Industrial Estate is accessed via Station Road, which runs directly west of the site in a north-south direction.

Several major roadways which carry substantial volumes of traffic exist in the vicinity of the site. The road network includes the M50 to the east, the Nangor Road to the south, the Newlands Road to the west and Cloverhill Road to the north.

The Dublin to Cork Railway Line traverses directly north of the site boundary.

The Grand Canal, running in an east-west direction, is situated approximately 300 metres to the south of the site.

11.3.4 Major Utilities (water, sewerage, power systems).

The site in question is an operational site that is fully serviced. It is provided with a supply of water, gas and electricity.

Currently, domestic wastewater generated on-site is directed to foul sewer and then onto Ringsend Wastewater Treatment Plant for treatment. Stormwater generated on-site is currently discharged to the public stormwater sewer serving Clondalkin Industrial Estate before being discharged via pipeline to the Gallanstown Stream.

A Gas Network Map showing the location of gas supply infrastructure in the vicinity of the site is attached in Appendix 14. An Electricity Network Map showing the location of electricity supply infrastructure in the vicinity of the site is shown in Appendix 15. An electrical sub-station (Building G) is situated on-site.

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11.3.5 Tourism and Recreational Infrastructure

The Grand Canal Greenway, a component of the county's green infrastructure network, is situated approximately 300 metres to the south of the site.

The centre of Clondalkin Town is situated approximately 1 km south of the site and is important from a tourism and recreational perspective due to the presence of a number of cultural heritage features in the town centre. The town centre is designated as an Architectural Conservation Area (ACAs), with Clondalkin Round Tower, a medieval mill and a number of historic religious features being located there.

Other amenities in the broader area include The Camac River which is approximately 750 metres south west of the site at its nearest point and Collinstown Park which is situated approximately 780 metres north of the site.

11.3.6 Assimilative Capacity of Water and Air

Stormwater run-off emanating from the site is currently directed towards the Gallanstown Stream situated approximately 280 metres to the south of the site. The Gallanstown Stream eventually flows into the River Camac at Kylemore Road south of the Grand Canal approximately 3.2 km to the east of the site.

Urban run-off may be having an adverse impact upon receiving waters. Monitoring undertaken by the EPA indicates that the River Camac has a Q3 (poor) biological quality rating.

The site is situated within an Industrial Estate and as such is surrounded by other commercial and industrial premises. In addition, several major roadways which carry substantial volumes of traffic exist in the vicinity of the site. It is expected that these activities would have an impact upon ambient air quality.

Baseline ambient air quality data for the region is available. Annual Mean Values for PM2.5, PM10, NO2, NOX, SO2, CO and Lead are detailed in Section 9.3.4 of this EIAR. No annual mean value for any parameter exceeded relevant Annual Mean Limits prescribed in the Air Quality Standards Regulations.

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11.3.7 Natural Resources

Metal Processors operational metal processing facility is situated on the subject site. A summary of the quantity of scrap lead accepted and processed at the facility in the last three years is shown in the table below.

Table 11-1 Quantity of Scrap Lead Accepted and Processed 2016 - 2018

	Quantity of Scrap Lead Accepted on-site, (tonnes)	Quantity of Scrap Lead remaining On-site at the end of the year, (tonnes)	Quantity of Scrap Lead Processed in the Year (tonnes)
2016	18,113	926	17,681
2017	17,300	830	17,396
2018	17,089	1,214	16,705

A summary of natural resources used at the facility for the last three years is shown in the table below.

Table 11-2 Resource Usage 2016 - 2018

	Total Energy Used (MWh)	Electricity Consumption (MWh)	Water Use (m3)
2016	3,180	526	1,616
2017	3,046	527	1,610
2018	2,927	519	1,610

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11.3.8 Waste Management

Operational processes at the facility currently result in the generation of a number of types of wastes. Wastes generated during the refining process include mixed metals, and hazardous wastes such as lead ash, lead dross, caustic tin dross, caustic antimony dross, pump dross and bag house dross. Non-hazardous waste types which arise regularly during on-site storage and distribution activities include cardboard, paper, plastic, aluminium, wood, steel and mixed municipal waste. Small quantities of other hazardous waste types such as waste oils, WEEE, fluorescent lights, aqueous waste and filter bags arise intermittently on-site.

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11.4 Impact Assessment

11.4.1 Construction Phase Impacts

There will be some soil excavation and site disturbance at the south eastern corner of the site as a result of modifications to the site drainage system. The impact of these construction works will be temporary and minor in nature however.

Given that construction activities will be taking place at a location on-site that is a considerable distance away from any sensitive receptor, it is not anticipated that such works will result in a significant impact upon sensitive receptors

Given that construction activities will be limited in scale and duration and temporary in nature, it is not anticipated that such works will result in a significant impact upon traffic and transportation infrastructure or utilities.

Potential exists for construction activities to have a slight, short-term negative impact on properties in close proximity to the site. Mitigation measures relating to noise and dust shall be implemented to eliminate and reduce impacts upon bordering properties.

A Construction and Demolition Waste Management Plan shall be implemented to ensure that all waste arising during construction works are adequately managed. This plan is detailed in Appendix 5.

Following a review of Gas and Electricity network Maps provided by Gas Networks Ireland and the ESB respectively, it was determined that excavation works associated with the development of the Dual Flow Drainage System will not impact any underground utilities. The footprint of the development area does not lie above utilities.

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11.4.2 Operational Phase Impacts

11.4.2.1 The Site

The proposal only involves one modification on-site. It is proposed to redirect 'first flush' stormwater generated in roof and yard areas on-site from discharging into the public stormwater sewer, which then discharges to the Gallanstown Stream, to foul sewer.

It is anticipated that this will have a positive impact on the water quality of the Gallanstown Stream and, in turn, the Camac River, which the Gallanstown flow into, which currently has a water quality status of Q3 or 'Poor'.

No other site modifications will take place under the proposal. The existing industrial activity taking place on-site will continue to be carried out under the proposal.

11.4.2.2 Property

It is anticipated that the continuation of the industrial activities occurring on-site will have no significant impact upon surrounding properties in the vicinity of the site and wider local area.

There are no proposals to change processing activities on-site, increase production levels on-site or to expand the facility spatially.

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As such, there will be no changes to the visual amenity or character of the area due to the proposal.

The Noise Impact Assessment undertaken, described in Section 10, has determined that noise emanating from proposed on-site noise sources will not have a significant, adverse impact upon sensitive properties in the local area.

Dust monitoring undertaken, detailed in Section 9.3.5.2 in the Air and Climate Chapter, has determined that the proposed activity will not cause the generation of excessive levels of dust at off-site properties.

11.4.2.3 Traffic and Transportation Infrastructure

As there is no proposal to significantly intensify existing industrial activities on-site, it is anticipated that there will be no significant increase in traffic levels associated with site activities and consequently no significant impact upon transport infrastructure in the surrounding area.

11.4.2.4 Major Utilities (water, sewerage, power systems)

The subject site is currently fully serviced. The proposal does not involve any changes to the nature and scale of production activities occurring at the facility. It is not proposed to expand the facility spatially either. As such, it is anticipated that there will be no requirements for additional supplies from major utilities.

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Under the proposal it is proposed to re-direct 'first flush' stormwater generated on-site from the public stormwater sewer to foul sewer. As such, there is expected to be a substantial increase in discharges to foul sewer. Irish Water have confirmed that they are willing to accept these discharges from on-site. From calculations completed by South Dublin County Council, on behalf of Irish Water, based on a discharge rate of 2 L/sec and a lead concentration of 500 µg/l from the site, the lead concentration increase at the Ringsend WWTP would equate to 0.0003789mg/l. As such, it is anticipated that there will be an imperceptible downstream impact upon WWTP operations. Correspondence from Irish Water confirming acceptance of proposed discharges to sewer is shown in Appendix 10.

11.4.2.5 Tourism and Recreational Infrastructure

There will be no impact upon any tourism and recreational amenities in the local area as these amenities are sufficiently remote from the proposed development.

11.4.2.6 Assimilative Capacity of Water and Air

Currently, stormwater containing elevated concentrations of lead is discharged to the receiving water body, the Gallanstown Stream. Under the proposal it is proposed to re-direct 'first flush' stormwater to foul sewer at a maximum flow rate of 2 l/s and at a maximum lead concentration of 500 µg/l.

During prolonged or intense rainfall, stormwater will by-pass being discharged to foul sewer and be directed towards the Gallanstown Stream. Due to occurrence of the 'first flush' effect

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it is anticipated that this by-pass stormwater will contain relatively low levels of lead however. An Assimilative Capacity Assessment carried out, described in more detail in Section 8 and contained in Appendix 8, has shown that the assimilative capacity of the Gallanstown Stream is sufficient for accepting by-pass surface water discharges from Metal Processors proposed dual flow drainage system, given the SW EQS for Lead of 1.2 µg/L, given evidence of the first flush effect occurring over time on-site and given the time it will take for the proposed retention tank to be used in connection with the dual flow system to fill up.

An Air Dispersion model, having regard to past stack emission monitoring results at emission point AE-1 on-site, was carried out to assess the impact air emissions from the smelting and refining processes will have on ambient air quality. This is contained in Appendix 11. It was determined that process related emissions from emission point AE-1 would be adequately assimilated by the ambient air environment and would not result in the contravention of any ambient air quality standards.

11.4.2.7 Natural Resources

It is not proposed to significantly change the nature or scale of production activities on-site or increase employment levels on-site significantly. Production levels will remain similar to what they were before under the applicant's existing Industrial Emissions Licence. As such, it is not expected that there will be any significant increase in the gas, water or electricity usage at the facility. Nor is it expected that there will be a significant increase in the amount materials used during processing operations.

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11.4.2.8 Waste Management

It not anticipated there will be any significant increase in the amount of waste materials leaving the facility given that it is not proposed to significantly change the nature or scale of operations.

11.5 Mitigation Measures

Mitigation Measures outlined in EIAR Chapters relating to Water, Air and Climate, and Noise (Sections 8, 9 and 10, respectively) are deemed to be sufficient for preventing the proposal from having adverse impacts upon Material Assets in the receiving environment.

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11.6 Residual Impacts

It is not anticipated that there will be any significant impacts upon material assets in the local area as a result of the proposed activity taking place given the mitigation measures proposed.

11.6.1 Cumulative Impacts

The site is situated in a well serviced urban area. In particular, the site is situated in a well-established and well serviced industrial estate. It is not anticipated there will be any significant, adverse cumulative impact on the material assets in the receiving environment. There are no significant planning proposals in the surrounding area that are likely to have a significant, adverse impact on material assets in the receiving environment surrounding the site.

11.6.2 Indirect Impacts

Construction phase and operational phase Noise and Dust emissions from the facility could potentially have an impact on material assets namely commercial property in close proximity to the site. Given existing and proposed construction phase and operational phase Noise and Dust mitigation measures, it is not anticipated these emissions will significantly adversely affect such material assets however.

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12. Cultural Heritage

12.1 Introduction

The EIAR Scoping Report (Volume 4 of the EIAR) concluded that no significant impacts upon Archaeology, Archaeological Heritage or Cultural heritage and amenities are anticipated given that there are no proposals to no proposals to expand the facility spatially.

Nonetheless, this chapter of the EIAR which addresses the potential impacts of the proposed activity on Cultural Heritage in the local area has been included for completeness.

This assessment was undertaken by a Senior Environmental/Planning Consultant, which is considered to be acceptable given that the proposed activity does not involve the development of any new areas or buildings.

12.2 Assessment Methodology

The assessment methodology for assessing impact of the proposed activity upon cultural heritage involves the following steps:

1. A review of relevant Legislation and Guidelines.
2. A desktop study of the site and surrounding area.
3. A walkover survey of the site and the surrounding area.

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12.2.1 Legislation and Guidelines

In completing this chapter regard was had to the following legislation and guidelines:

Relevant Legislation:

- The National Monuments Act, as amended
- The Heritage Act 2018
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999
- Planning and Development Act, as amended

Relevant Guidelines:

- EPA's Guidelines on Information to be contained in EIAR's (2017) (Draft)
- EPA's Advice Notes for preparing Environmental Impact Statements (2015)
- Framework and Principles for the Protection of Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands, 1999).

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12.2.2 Desktop Study

The following resources were referred to when assessing the cultural heritage associated with the site and surrounding area:

- National Monuments Service's Record of Monuments and Places (RMP)
- Archaeological Survey of Ireland's Sites and Monuments Record (SMR)
- National Monuments Service's National Inventory of Architectural Heritage (NIAH)
- South Dublin County Council's Development Plan 2016 – 2022
- Ordnance Survey of Ireland's Historical Mapping;
    - Historic Map 6 Inch Colour (1837-1842)
    - Historic 6 Inch Black & White (1837-1842)
    - Historic Map 25 inch (1888-1913)
    - Ordnance Survey of Ireland's Aerial Photography (1995, 2000 and 2005)

12.2.3 Site Survey

A survey of the subject site and the lands surrounding the site took place in order to examine existing land uses in the local area and identify cultural heritage features of significance. This survey took place on the 25th of July 2018. A number of cartographic sources referred to show that that the site consisted of an open field until its current development.

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12.3 Baseline Environment

12.3.1 Description of the Site and the Surrounding Area

The applicant's site is based on Station Road, Clondalkin, Dublin 22. It comprises a manufacturing facility situated in a well-established industrial estate, Clondalkin Industrial Estate. It is surrounded on all sides by commercial and industrial premises. Clondalkin Town Centre is situated 1 km south of the site.

12.3.2 History of Clondalkin

Clondalkin town is situated approximately 1 km south of the site and 10 km west of Dublin City Centre. It is one of the county's oldest urban areas. Cultural heritage features of interest dating from the Pre-historic, Early Medieval, Medieval and Post Medieval periods can be found in and around the area.

A monastic settlement was founded in Clondalkin around the 7th century. It is thought that the Clondalkin Round Tower was built shortly after this period. Norsemen invaded in 832, 1071, and again in 1076 AD when they settled in the area. Clondalkin was established as a borough in 1300 and in 1547 it was recorded that: "Clondalkin is among the walled and good towns of the County." Clondalkin was the scene for some of the fighting in the 1641 Rebellion between the Gaelic Irish and the Old English.

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Lewis (1837)[8] describes a busy and thriving town with quarries, farming and mills situated in the vicinity. A number of significant churches and chapels were built in Clondalkin during the post medieval period including St. John's Church (1789) and the Church of the Immaculate Conception (1857). Clondalkin paper mill was established at the start of the 19th century and played a significant part in the development of the town. The Southern and Western Railway Line was built north of the town and this was instrumental in connecting the town with Dublin and providing links to the west and south.

Modern Clondalkin is a well-developed, busy satellite town of Dublin, with a population of 46,813 in 2016.

12.3.3 Archaeological and Cultural Heritage Features

There are no recorded archaeological or cultural heritage sites situated within the subject site.

An old bridge (c.1860) spanning the Dublin to Cork railway lining is situated directly northwest of the site. A former railway station building (c.1850), now used as a house, is situated 100 metres north west of the site.

An area of significant architectural heritage is situated in the vicinity of the Ninth Lock of the Grand Canal to the south west of the site. The Ninth Lock is of architectural significance that was built ca. 1780. The lock keepers house, built in the early 19th century, is situated adjacent to the lock itself. A number of other protected dwellings built in the early 20th century are situated in close vicinity of the Ninth Lock.

As a result of Clondalkin's long and rich history, numerous archaeological and cultural heritage features are situated in the wider area, particularly in Clondalkin Town. The centre of Clondalkin Town is designated as an Architectural Conservation Area (ACAs) in South Dublin County Councils Development Plan 2016 – 2022, with important cultural heritage features such as Clondalkin Round Tower, a medieval mill and historic religious features being located there.

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12.4 Impact Assessment

The site is situated in a well-established industrial area. There are no recorded features of archaeological or cultural heritage occurring within the site.

It is not anticipated that there will be any significant construction phase impacts upon features of archaeological or cultural heritage given the limited scale of excavation and construction works, and given that soils and sub-soils underlying the site comprises recently made ground.

There are no proposals to expand the facility spatially or construct new buildings or extensions at the facility. There are no proposals to engage in any new forms of production on-site and it is not expected existing production activities will intensify significantly.

As such, it is anticipated the proposed activity will have a negligible impact upon cultural heritage features in the surrounding area.

[8] A Topographical Dictionary of Ireland. Samuel Lewis, 1837

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12.5 Mitigation Measures

As the proposed activity will have a negligible impact upon cultural heritage in the local area, no mitigation measures have been proposed.

12.6 Residual Impacts

It is not anticipated the proposed activity will have a significant direct, indirect or cumulative impact upon cultural heritage features in the local area given the nature and location of the proposed activity.

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13. Landscape

13.1 Introduction

The EIAR Scoping Report (Volume 4 of the EIAR) concluded that no significant impacts upon Landscape or Visual Amenity are anticipated given that there are no proposals to no proposals to expand the facility spatially.

Nonetheless, this chapter of the EIAR which addresses the potential impacts of the proposed activity on Landscape and Visual Amenity in the local area has been included for completeness.

This assessment was undertaken by a Senior Environmental/Planning Consultant, which is considered to be acceptable given that the proposed activity does not involve the development of any new areas or buildings.

This section of the EIAR assesses how the proposed activity will sit into its physical landscape and whether it has the potential to have a visual impact upon sensitive receptors or an impact upon landscape character.

Landscape is defined as follows:

''Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.''

(Council of Europe, 2000).

"Landscape is about the relationship between people and place. It provides the setting for our day-to-day lives. The term does not mean just special or designated landscapes and it does not only apply to the countryside. Landscape can mean a small patch of urban wasteland as much as a mountain range, and an urban park as much as an expanse of lowland plain. It results from the way that different components of our environment - both natural (the influences of geology, soils, climate, flora and fauna) and cultural (the historical and current impact of land use, settlement, enclosure and other human interventions) - interact together and are perceived by us. People's perceptions turn land into the concept of landscape".

(Landscape Institute and Institute of Environmental Assessment, Guidelines for Landscape and Visual impact Assessment, 3rd Edition, 2013).

This Landscape and Visual Impact Assessment has been undertaken having regard to guidance and advice on the subject provided in the following documents:

- EPA's Advice Notes for preparing Environmental Impact Statements (2015)
- Environmental Protection Agency: Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Draft), 2017.
- Landscape Institute and Institute of Environmental Assessment, Guidelines for Landscape and Visual impact Assessment, 3rd Edition, 2013.

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13.2 Assessment Methodology

The methodology for carrying out the Landscape and Visual Impact Assessment was as follows:

1. Review of Project Documentation and Drawings
2. National Landscape Strategy for Ireland 2015-2025
3. Review of South Dublin County Council Development Plan 2016 – 2022
4. Review of Landscape Character Assessment of South Dublin County, 2015
5. A desktop study of historical and current OS mapping, aerial photographs
6. A review of the National Parks and Wildlife Services Map Viewer
7. A review of National Monuments Service interactive Site and Monuments Records.
8. A site walkover addressing:
    - The extent of visibility
    - Localised screening effects
    - Land use in the local area
    - Landscape Context and Character
    - Viewpoints within the study area (private and public)
    - Residential dwellings in the immediate area
    - Areas of visual amenity
    - Archaeological, historical and cultural features
9. A Qualitative Assessment of Landscape and Visual Impacts of the Proposed Activity.
10. Preparation of a Landscape and Visual Impact Assessment Report for the EIAR

The Impact Assessment criteria used in this chapter is based on the criteria that has been established by the EPA in their Guidance Document *Guidelines on the Information to be contained in Environmental Impact Assessment Report,* which is detailed in Section 1.8 of this document.

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13.3 Baseline Environment

The assessment of the existing environment in relation to landscape and visual amenity involved addressing the constituent elements and the character of the landscape, the landscape context and areas of significance such as views and prospects and other areas of visual amenity. Past changes in landscape and potential future changes in landscape in the local area and wider region were also addressed.

13.3.1 Landscape Character

The site is situated in a well-established industrial area within a broader Landscape Character Area defined as Urban Lowland in South Dublin County Council's development Plan 2016-2022.

13.3.2 Landscape Context

The site lies in a low-lying built-up area, and more specifically, within Clondalkin Industrial Estate in the townland of Ballymanaggin, Dublin 22, in an area that is distinctly industrial and bleak in nature. It is immediately surrounded by commercial and industrial premises, and more broadly, various housing estates situated in Clondalkin, Ronanstown and Cherry Orchard. Clondalkin Town Centre is situated approximately 1 km south of the site.

Transport networks including the Dublin to Cork Railway Line, the M50 and the Grand Canal are key features of the broader landscape in the region.

Noteworthy areas where the site can be viewed from include the Dublin to Cork Railway Line where it traverses directly north of the site, and Station Road where it traverses directly west of the site from an elevated position.

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13.3.3 Areas of Visual Amenity

The nearest residential dwellings to the site are situated in James Connolly Housing Estate and on Station Road to the south west of the site, Ballymanaggin Lane to the south of the site and in Raheen to the north west of the site. It is noted Planning Permission (Ref: SD17A/0397) has been granted for 85 dwellings comprising 65 houses and 20 apartments at a site approximately 65 metres north west of the site boundary on Cloverhill Road, Raheen, Dublin 22. At the time of writing construction has not commenced on-site however it is anticipated construction will commence on-site in the near future.

No Prospects designated for protection or preservation in the Landscape Character Assessment for South Dublin (2015) lie within the local area of the site. The site itself is situated in a low-lying built up area.

The nearest viewpoints put forward for designation in the Plan are views from the Grand Canal. No other Views put forward for protection or preservation in the Landscape Character Assessment are situated within the local area of the site. The Grand Canal lies approximately 300 metres to the south of the site at its nearest point and traverses in an east-west direction. It is a designated Greenway that forms part of the County's Green Network and the National Transport Authorities Greater Dublin Cycle Network. In addition, it is designated as a proposed Natural Heritage Area (pNHA) under the Wildlife Amendment Act (2000) due to the presence of important habitats and species.

The facility complex does not significantly intrude on views along the section of the Grand Canal to its south however due to the presence of intervening industrial and commercial structures between the Grand Canal and the site. The only element of the site that can be seen from the Grand Canal to the south is the Air Emission Stack (40 m high). It is noted that this section of the Grand Canal is situated in an area that is distinctly peri-urban and industrial in character.

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An area of significant architectural heritage is situated in the vicinity of the Ninth Lock of the Grand Canal to the south west of the site. The Ninth Lock itself is a canal of architectural significance that was built ca. 1780. The lock keepers house, built in the early 19th century, is situated adjacent to the lock itself. A number of other protected dwellings built in the early 20th century are situated in close vicinity of the Ninth Lock.

Aerial Photography of the local area showing the site and sensitive visual receptors surrounding the site is shown in Figure 13-1.

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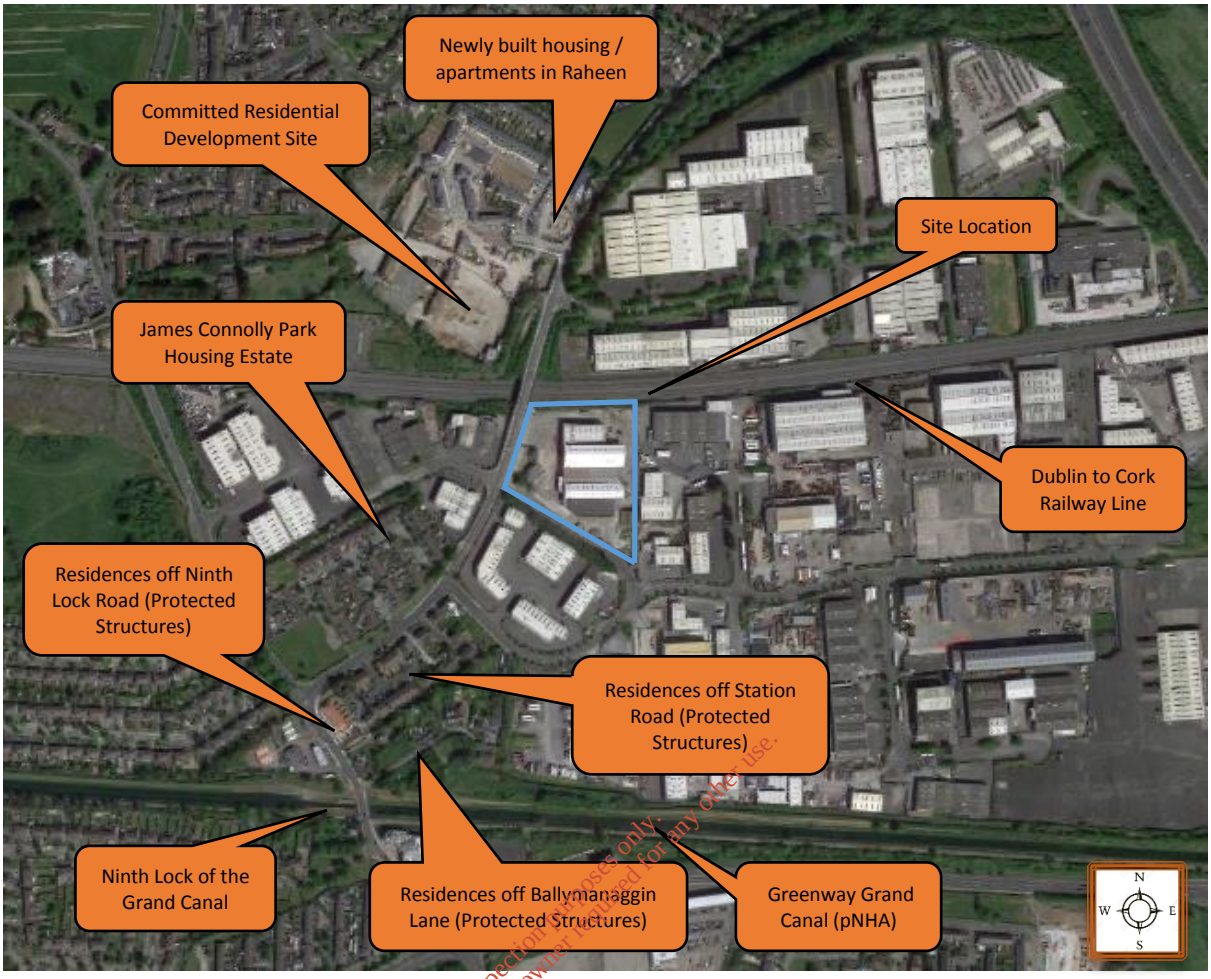

Figure 13-1 Aerial Photo showing Sensitive Visual Receptors surrounding the site

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13.4 Impact Assessment

This section addresses potential impacts upon Landscape Character and Areas of Visual Amenity as a result of the proposed activity to place at the facility.

13.4.1 Construction Phase Impacts

It is not anticipated that construction works associated with the development of the dual flow proposal will have any significant visual impact upon sensitive receptors as views onto the site from surrounding residential receptors are fully blocked.

It is possible construction works will create negative, slight, short term visual impacts upon surrounding commercial premises. Mitigation measures shall be implemented to reduce these visual impacts.

13.4.2 Operational Phase Impacts

13.4.2.1 Impact on Landscape Character

The landscape impacts of the proposed activity are imperceptible and neutral in nature. This is because the proposed activity does not involve any alteration to the size, design or appearance of the facility. No new overground structures will be built on-site and no existing structures will be altered. In addition, the site is situated in a well-established industrial area and is well integrated with its surroundings.

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13.4.2.2 Impact on Areas of Visual Amenity

The proposed activity does not have an impact upon any designated Prospect or View put forward for designation in South Dublin County Council's Development Plan. There are no designated Prospects situated within the local area, which is a low-lying, built up area.

13.4.2.2.1 Impact upon Viewpoints

The nearest viewpoints put forward for designation in the Plan are views from the Grand Canal. Site buildings or operations cannot be seen from any section of Grand Canal Greenway where it runs in to the south of the site. The Emission Stack (40 m high) is visible from certain stretches of the canal visible but this element of the site is not a dominating feature visually and is in line with the local landscape character of the area. As the proposed activity does not involve any material change in the physical characteristics of the facility it was deemed that it would have no effect on viewpoints along the canal. Photography of views from the Grand Canal towards the site is shown in Figure 13-2 and Figure 13-3 below.

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Figure 13-2 View from Ninth Lock Bridge towards the direction of the site

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Figure 13-3 View from Grand Canal towards the site

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13.4.2.2.2 Impact upon Housing

The proposed activity will have an imperceptible visual impact on housing as well as areas of architectural heritage in the local area. This is because the site is situated in an area that is distinctly industrial in character and there is no proposal to materially alter the sites physical characteristics. In addition, the facility is well screened from housing to the south east, south and north east by the presence of a combination of commercial/industrial premises as well as tree linings in the intervening space between the site and these receptors.

It is noted that newly built apartments and houses are situated in Raheen approximately 170 metres to the north east of the site. In addition, Planning Permission has been granted for a number of apartment units on an adjacent site. There may be views of the site from the upper floors of these apartments.

The Emission Stack situated on-site may be seen from some houses situated in Ballymanaggin Lane and James Connolly Park but this feature is not visually dominant nor is it out of character for the area.

The facility cannot be seen from the Ninth Lock Road or the Ninth Lock of the Grand Canal where some structures and houses of historical and architectural heritage are situated due to the presence of this screening.

Photography showing views from residential receptors in the local area towards the site is shown in Figure 13-4, Figure 13-5 and Figure 13-6 below.

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Figure 13-4 View from Ballymanaggin lane towards the site

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Figure 13-5 View from Station Road towards the site

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Figure 13-6 View from Raheen residences towards the site

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13.4.2.2.3 Impact upon Passers-by

Activities taking place in the yard area on-site may be momentarily viewed from trains passing by on the Dublin to Cork Railway line and by road traffic passing by on Station Road which runs directly west of the site on an elevated level. Site activities, namely the movement of trucks and forklifts and loading/unloading operations will have a slight, frequent and momentary visual effect upon users of these transport routes. As the site is situated in a well-established industrial area where such activities are normal and happen at various surrounding sites routinely, it is not deemed that activities taking place in the yard on-site would have a significant visual impact upon these transport routes or the surrounding area generally.

Photography showing views from transport routes in the local area towards the site is shown in Figure 13-7 and Figure 13-8 below.

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Figure 13-7 View of Dublin to Cork Railway Line looking onto the site

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Figure 13-8 View from Station Road Bridge onto the site

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13.5 Mitigation Measures

As is currently taking place on-site, it is proposed to continue to carry out material stockpiling and storage and processing/production activities indoors on-site to prevent negative visual effects on the surrounding area.

Hoarding shall be provided during the construction phase to reduce visibility of the construction works.

13.6 Residual Impacts

Taking into account the above mitigation measures, as well as the lack of any material change to overground structures on-site, the proposal to carry out storage and processing/production activities indoors on-site, and the current urban and industrial character of the local area; it is deemed the proposed activity will have an imperceptible and neutral impact upon landscape and visual amenity. The proposed activity will not any significant direct, indirect or cumulative impact on landscape and visual amenity.

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14. Indirect Impacts, Cumulative Impacts and Interactions

14.1 Introduction

This section addresses indirect impacts, cumulative impacts and interaction between impacts associated with environmental topic headings considered in this EIAR. The approach taken in this section is guided by the EIA Directive (Directive 2011/92/eu amended by 2014/52/eu).

14.2 Methodology

The potential for indirect impacts, cumulative impacts and interaction between impacts was considered during the screening and scoping stages of the EIA. Where the potential for significant indirect impacts and cumulative impact and interactions were identified, such impacts and interaction of impacts were included in the scope of the EIA and addressed in the baseline and impact assessment studies carried out under each environmental topic heading.

Regard was has to the following guidance documents when identifying and evaluating indirect and cumulative impacts an interactions.

- EPA Guidelines on Information to be contained in EIAR's (2017) (Draft)
- EPA Advice Notes for preparing Environmental Impact Statements (2015)
- European Commission Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (1999)

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The matrix and expert opinion approaches, as outlined in European Commission's Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, where used to identify and evaluate potential significant cumulative and indirect impacts and interactions.

14.3 Definitions

The following definitions, as prescribed in European Commission *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*, were referred to when completing this section.

- Indirect Impacts: Impacts on the environment, which are not a direct result of the project, often produced away from or as a result of a complex pathway. Sometimes referred to as second or third level impacts, or secondary impacts.

- Cumulative Impacts: Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.

- Impact Interactions: The reactions between impacts whether between the impacts of just one project or between the impacts of other projects in the areas.

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14.4 Indirect and Cumulative Impacts

Indirect and cumulative impacts on the environment associated with the proposed activity are addressed in the EIAR within relevant Environmental Topic Chapters under relevant '*Indirect Impacts'* and '*Cumulative Impacts'* headings. It has been determined that there will be no significant adverse indirect or cumulative impacts on the environment as a result of the proposed activity.

It is anticipated that the development of the Dual Flow Drainage System will have a slight to moderate positive impact on water quality in receiving water bodies and therefore potentially a positive impact on receiving water body ecology and amenity value.

14.5 Impact Interactions

Table 14-1 below has been developed to identify potential interrelationships between proposed activity impacts considered under the environmental topic chapters in the EIAR. The table is presented as a matrix which identifies the potential for impact interrelationships between topics listed in the left-hand column and topics listed in the top row. A brief overview of potential impact interactions is shown below the table. Potentially significant impact interactions are addressed throughout the EIAR in relevant Environmental Topic Chapters.

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Table 14-1 Impact Interactions

Interaction	Population and Human Health		Biodiversity		Land, Soils and Hydrogeology		Water		Air and Climate		Noise		Material Assets		Cultural Heritage		Landscape	
	Const.	Op.	Const.	Op.	Const.	Op.	Const.	Op.	Const.	Op.	Const.	Op.	Const.	Op.	Const.	Op.	Const.	Op.
Population and Human Health			✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
Biodiversity					X	X	✓	✓	X	X	X	X	X	X	X	X	X	X
Land, Soils and Hydrogeology							X	X	X	X	X	X	X	X	X	X	X	X
Water									X	X	X	X	✓	✓	X	X	X	X
Air and Climate											X	X	✓	✓	X	X	X	X
Noise													✓	✓	X	X	X	X
Material Assets															X	X	X	X
Cultural Heritage																	X	X
Landscape																		

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14.5.1 Potential Interactions

14.5.1.1 Water, Biodiversity, and Population and Human Health

Aqueous emissions associated with the proposed activity potentially impacting upon the water quality of receiving waters may lead to an adverse impact upon aquatic ecology and consequently an impact upon the amenity value, namely people's enjoyment of receiving water bodies.

14.5.1.2 Air, and Population and Human Health

Air emissions from the smelting/refining process and fugitive dust emissions associated with the proposed activity adversely impacting the ambient air quality environment may in turn have an impact on human health and well-being in the local area.

14.5.1.3 Noise, and Population and Human Health

Noise emissions associated with facility operations adversely impacting the local noise environment may in turn have an impact on human health and well-being in the local area.

14.5.1.4 Air, Noise, Material Assets, and Population and Human Health

The proposed activity, in particular noise and dust emissions associated with facility operations could potentially adversely impact upon residential and commercial properties in the local environ of the site. This in turn could affect human health and well-being in the local area.

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14.5.1.5 Water, and Material Assets

A deterioration of water quality as a result of proposed aqueous discharge to the receiving environment could affect natural resources, namely the assimilative capacity of receiving water bodies.

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