AIR QUALITY (DUST) IMPACT ASSESSMENT

Proposed Seawall Replacement Works

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F01
Proposed Seawall
Replacement Works,
Largs
21 July 2022

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1 INTRODUCTION

1.1 This Document

This air quality (dust) assessment, undertaken to accompany the planning application, considers the air quality impacts arising during the construction phases of the project. In undertaking this assessment, RPS experts have exercised professional skills and judgement in accordance with methods of best practice to provide professional opinions that are objective, reliable and backed with scientific rigour.

The air quality impacts are assessed in accordance with the requirements of Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM); Guidance on the Assessment of Dust from Demolition and Construction, 2014.

This document also summarises the relevant legislation and guidance in regard to air quality and reviews background pollution concentrations in the North Ayrshire Council area.

1.2 Background

RPS was commissioned by North Ayrshire Council to undertake an air quality (dust) assessment for a proposed seawall replacement works, located at Largs, Scotland. The existing seawall at Largs retains the promenade and protects the shore side buildings and infrastructure from wave action and coastal erosion. It is c.300m in length, with the height varying along its length following the profile of the beach below. The retained height varies from approx. 1.0m to 4.0 m, and the top level of the seawall is approximately +5.16mCD along the full length. The public have access to the seawall and the beach below when the tide allows.

1.3 Site Location

The Largs Promenade extends from Largs Harbour at the south to the mouth of the Noddsdale Water at the north, with a wall along the seaward length of the promenade transitioning to a sea wall from the RNLI slipway for approximately 300m north. Largs is a coastal town, which is located due west of Glasgow, within North Ayrshire Council area. The site location is illustrated in Figure 1.1.

Figure 1.1: Site Location

1.4 The Proposed Development

1.4.1 Existing Seawall Structure

The existing seawall at Largs retains the promenade and protects the shore side buildings and infrastructure from wave action and coastal erosion. It is c.300m in length, with the height varying along its length following the profile of the beach below. The retained height varies from approx. 1.0m to 4.0 m, and the top level of the seawall is approx. +5.16mCD along the full length. The public have access to the seawall and the beach below when the tide allows.

It was constructed from reinforced concrete in the 1970s as a replacement facing for the old seawall. This 1970s facing was covered in a gunite (sprayed concrete) facing in more recent years, but this has since failed and become detached from the 1970s concrete wall. The gunite was partially removed in 2018.

Recent surveys have indicated that the existing seawall structure is deteriorating in several ways:

- **Concrete Deterioration:** There is clear deterioration of the gunite facing concrete, where it remains attached to the existing wall face. There are high levels of corrosion of the existing wall reinforcement, with patches of exposed reinforcement visible throughout the length of the wall. High levels of chloride ingress to the existing concrete wall have also been identified.
- **Undermining:** The seawall is undermined along a section of wall (approx. 12m in length) where the toe is exposed, and no sheet piles were installed. This undermining is the likely cause of loss of material and subsidence of the promenade surface in recent years.
- **Steps:** There are three sets of steps ranging in height from 1.8m to 3.1m located along the length of the seawall. These are unsafe for use and are currently fenced off.

1.4.2 Proposed Development Plan

The proposed seawall replacement scheme comprises the replacement/encapsulation of the existing 300m long seawall. It consists of the following main elements:

- Controlled removal of existing steps which are unsafe for use.
- Installation of precast concrete caissons along the front of the existing seawall to act as a foundation to facilitate the placement of precast concrete seawall units.
- Placement of granular infill in the concrete caisson units,
- The precast caisson base unit will be filled with granular material. The base will be topped with a mortar layer, with the concrete seawall units then installed (Example of proposed seawall units shown in Figure 4). The precast units will be shaped for them to interlock, then grouted and sealed to both sides, thus avoiding the requirement for dowels or protruding reinforcement
- Placing of granular backfill between the front face of the existing seawall structure, and the rear face of the new precast structure. Suitable drainage to be provided within the backfill. Surfacing of backfill with concrete or asphalt pavement to tie into existing promenade. New / reinstatement of handrail along the promenade.
- Placement of rock armour scour protection in-front of the new precast concrete seawall units to prevent undermining of the toe of the new structure.
- Installation of steps at required intervals along seawall structure.

The form of foundation and structure varies along the length of the seawall to account for the varying profiles of the existing seawall structure. The proposed development plans are displayed in **Appendix A**.

1.4.3 Proposed Construction Methodology

A summary of the likely project phases is set out below.

Demolition/ Site Clearance/ Site Set Up There will be a temporary site compound in the immediate vicinity of the site to support the proposed development during the construction period. The location of this has not yet been determined, however one option may be at the northern end of the seawall close to Aubrey Crescent. The area of works along the promenade and beach will be fenced off, and initial works will see the partial removal of the existing concrete steps with a rock breaker mounted on small excavator working from the beach. The existing handrail along the promenade will be removed and stored for reuse. This phase is likely to take approx. 3 weeks.

It is anticipated that the beach and the promenade will be closed for the duration of the construction work to ensure public safety, however there may be opportunities to open sections of the beach and promenade early if site security and safety measures allow. RNLI access including parking will be maintained at all times. Storage of materials on the promenade may be considered where off site storage is not feasible.

It is planned to retain a walkway along the edge of the site, creating a temporary walkway on the grassed area between Greenock Road and the promenade. Construction access to the beach is expected to be via a temporary access ramp constructed to the side of the RNLI slipway.

- **Protection Works for the Existing Seawall structure**

  Sheet piles will be installed to the front edge of the toe along the length of the existing wall to provide temporary protection against undermining whilst excavations are being carried out. These will be installed using a vibratory hammer where possible. It is expected that due to the nature of the ground conditions to the south of the site an impact hammer may be required to install the piles. It is conservatively estimated that 150 m of the 300 m anticipated length of piling may be driven by means of impact piling. This phase is likely to take approx. 6 weeks and would run concurrent to removal of the steps.

- **Excavation**

  Beach material will be excavated to facilitate the installation of the concrete caisson units using a small excavator working from the beach to prevent settlement into the sand. The material is likely to be taken offsite for disposal to a licenced facility or beneficially re-used (subject to testing to confirm suitability of material, and identification of a suitable receptor). This phase is likely to take approximately 9 weeks.

- **Seawall Installation**

  The toe of the proposed replacement wall will be excavated to low water level with a small excavator working from the beach, and bedding material added (lean mix concrete). The caisson units will be installed on top of the material by a crane or telehandler on the promenade or beach and filled with granular material. The precast concrete seawall unit will be placed on top and grouted into place. The space between the replacement seawall unit and the face of the existing seawall will be backfilled and compacted by an excavator working from the promenade, then surfaced with asphalt to tie into the existing promenade. The existing handrail will be removed. The precast installation is likely to take approximately 9 weeks, with the backfilling and surfacing works taking approximately 8 weeks. Scour protection will be installed with suitably sized/graded rock placed in layers on the beach surface to the front of the precast concrete seawall, by an excavator working on the beach area. The timing of each phase of works will be subject to tidal restrictions on working.

- **Surfacing**

  Asphalt surfacing will be placed on the newly constructed section of promenade and resurfacing works to the existing promenade will also be carried out at this time. All areas of surfacing will include a rolled asphalt surface course containing 14mm red coated chippings. All benches, bollards, movable planters and litter bins will be removed prior to the promenade resurfacing and reinstated upon completion.

- **Street furniture and Beach Access**

  It is proposed to install a new handrail along the length of the new seawall. Access to the beach will be provided to the north and south ends of the beach, with ramp access at the Aubrey Crescent end of the seawall. Steps will be installed at an intermediate point along the wall. These will be precast concrete steps, and have a gate to the top edge and railings that tie in with the proposed new handrail along the crest of the new seawall.

2 POLICY AND LEGISLATIVE CONTEXT

Air pollution can have an effect on people's health. Exposure to air pollution can have long-term effects on health, it also has negative impacts on the environment. The UK government's and devolved administrations' primary objective is to ensure that all members of the public should have access to outdoor air without significant risk to their health, where this is economically and technically feasible.

2.1 EU Legislation

The following EU Directives set limits for air pollutants in ambient air:

- Cleaner air for Europe (CAFÉ directive – 2008/50/EC), and
- Air quality 4th daughter directive.

2.2 UK Air Quality Strategy

Local authorities are responsible for reviewing the state of air quality in their district council area. To assist them with this process, an air quality strategy (AQS) has been devised for the UK. This sets out standards and objectives for the air quality pollutants causing the problems and enables councils to review air quality in their area against these. Scottish departments also have a responsibility to ensure limit values, target values and alert thresholds for specified pollutants are not exceed. The AQS is presented in two volumes:

- Volume 1 of the UK air quality strategy,
- Volume 2 of the UK air quality strategy.

In most cases, the AQS objectives are identical to the EC Directive limit values, the only differences being the more stringent dates by which the former must be achieved.

2.3 Scottish Legislation

The UK Government leads on the UK's input to International and European legislation relating to Air Quality, with input from the Scottish Government, and the other devolved administrations. Linking to the requirements of the EU Directives, the UK Air Quality Strategy published in July 2007 established the framework for air quality improvements across the UK. Measures agreed at the national and international level are the foundations on which the strategy is based. The strategy sets out the Air Quality Standards and Objectives which have been set to benchmark air quality in terms of protecting human health and the environment.

The objectives adopted in Scotland for the purpose of Local Air Quality Management are set out in the Air Quality (Scotland) Regulations 2000, the Air Quality (Scotland) Amendment Regulations 2002 and the Air Quality (Scotland) Amendment Regulations 2016. Similar targets are set at EU level, where there are called limit or target values. These are set out in the European 2008 Ambient Air Quality Directive (2008/50/EC) and transposed into Scottish legislation by the Air Quality Standards (Scotland) Regulations 2010. It is the responsibility of EU Member States to achieve the limit and target values.

2.4 Summary of Key Legislation

2.4.1 The 2008 Ambient Air Quality Directive (2008/50/EC)

European air quality legislation is consolidated under the Ambient Air Quality Directive (Directive 2008/50/EC), which came into force on 11 June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a consistent manner and provides Ambient Air Directive (AAD) Limit Values for sulphur dioxide, nitrogen dioxide, benzene, carbon monoxide, lead and particulate matter with a diameter of less than 10µm (PM_{10}) and a new AAD Target Value and Limit Value for fine particulates (those with a

diameter of less than 2.5µm ($PM_{2.5}$). The fourth daughter Directive - 2004/107/EC - was not included within the consolidation. It sets health-based Target Values for polycyclic aromatic hydrocarbons (PAHs), cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable. Directives 2008/50/EC and 2004/107/EC are transposed under Scottish Law into the Air Quality Standards (Scotland) Regulations (2010), and subsequent amendments.

The UK Government and the devolved administrations are required under the Environment Act (1995) to produce a national air quality strategy. This was last reviewed and published in 2007. The Air Quality Strategy (AQS) sets out the UK's air quality objectives and recognises that action at national, regional and local level may be needed, depending on the scale and nature of the air quality problem. This includes additional targets and limits for 15-minute sulphur dioxide and 1,3-butadiene and more stringent requirements for benzene and PAHs, known as AQS Objectives. Environmental Assessment Levels (EALs) for other pollutants are presented in the Integrated Pollution Prevention and Control (IPPC) Environmental Appraisal of BAT document H1.

AAD Target and Limit Values, AQS Objectives, and EALs are set at levels well below those at which significant adverse health effects have been observed in the general population and in particularly sensitive groups. In other words, the levels have a margin of tolerance built in that enables a degree of confidence to be adopted.

The limit values and objectives relevant to this assessment are summarised in Table 2.1~~Table 2.1~~.

Table 2.1: Air Quality Objectives Included in Regulations for the Purpose of LAQM in Scotland

Pollutant	Air Quality Objective		To be achieved by
	Concentration	Measured as	
Nitrogen Dioxide (NO_2)	40 µg m^{-3}	Annual mean	31 December 2005
	200 µg m^{-3} not to be exceeded more than 18times a year	1-hour mean	31 December 2005
Particulate Matter (PM_{10})	18 µg m^{-3}	Annual mean	31 December 2010
	50 µg m^{-3}, not to be exceeded more than 7 times a year	24 hour mean	31 December 2010
Particulate Matter ($PM_{2.5}$)	10 µg m^{-3} (target)	Annual mean	2020

Local Air Quality Management Technical Guidance (2016) referred to as LAQM.TG(16), outlines that the AQALs apply in the following locations:

- Annual mean - all locations where members of the public might be regularly exposed - i.e. building facades of residential properties, schools, hospitals, care homes etc.
- 24-hour mean and 8-hour mean - all locations where the annual mean objective would apply together with hotels and gardens of residential properties.
- 1-hour mean - all locations where the annual mean, 24-hour and 8-hour mean apply together with kerbside sites and any areas where members of the public might be reasonably expected to spend one hour or more.
- 15-minute mean - all locations where members of the public might reasonably be exposed for a period of 15 minutes or more.

2.4.2 Local Air Quality Management Technical Guidance 2016

Local Air Quality Management Technical Guidance LAQM.TG16 supersedes all previous versions. It is designed to support local authorities in carrying out their duties under Section 82 of the Environment Act (1995) (Part IV), and subsequent regulations.

Authorities will continue to appraise air quality, with the main emphasis on those pollutants shown to be challenging in respect of compliance i.e. Nitrogen Dioxide (NO_2), Particulate Matter (PM_{10}) and Sulphur Dioxide (SO_2). Scotland has still to consider changes to LAQM and continues to work according to the previous regime.

At the core of LAQM delivery are three pollutant objectives; these are:

- Nitrogen Dioxide (NO_2),
- Particulate Matter (PM_{10}), and;
- Sulphur Dioxide (SO_2).

All current AQMA's across the UK are declared for one or more of these pollutants, with NO_2 accounting for the majority. It is a statutory requirement for local authorities to regularly review and assess air quality in their area and take action to improve air quality when objectives set out in regulation cannot be met.

Reflecting feedback under the LAQM review process, the UK Government has decided to retain Benzene, 1,3 -Butadiene, Carbon Monoxide and Lead in regulations for England. In recognition of the fact that all of the objectives for these pollutants have been met for several years and are well below limit values, local authorities in England do not have to report on these pollutants unless local circumstances indicate otherwise. These pollutants remain a statutory reporting requirement in Scotland, Wales and Northern Ireland.

As of January 2016, there are more than 700 AQMAs currently declared across the UK (nearly 600 of which are in England). Of these, the vast majority (over 90%) are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely, sometimes in association with exceedances of the 24-hour mean PM_{10} objective, or in Scotland the annual mean PM_{10} objective. By comparison, there are very few AQMAs associated with domestic, industrial or other transport-related emissions, although in Northern Ireland a number of AQMAs have been declared as a consequence of pollution associated with the residential heating sector (Defra, 2016).

Examples of where air quality objective may apply is given in Table 2.2

Table 2.2: Example of where Air Quality Objectives apply

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual-mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building's façades), or any other location where public exposure is expected to be short-term.
Daily mean	All locations where the annual-mean objective would apply, together with hotels. Gardens of residential properties	Kerbside sites (as opposed to locations at the building's façade), or any other location where public exposure is expected to be short-term
Hourly-mean	All locations where the annual and 24-hour mean would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks and bus stations etc which were not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations to which the public might reasonably be expected to spend 1-hour or longer	Kerbside sites where the public would not be expected to have regular access

2.4.3 IAQM Guidance on the Assessment of Dust from Demolition and Construction, 2014.

There is the potential for dust to be released into the atmosphere as a result of construction. These fugitive dust emissions have been assessed on a qualitative basis in accordance with the methodology outlined within the 2014 IAQM guidance document - *'Guidance on the assessment of dust from demolition and construction'.*

The effect of construction phase activities has been assessed in accordance with IAQM guidance. The guidance is structured to determine the risk of dust effects arising from four types of construction phase activities. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (the transport of dust and dirt from the construction / demolition site onto the public road network).

A site is allocated to a risk category for dust emissions for each of the activities above based on two factors; dust emission magnitude, and the sensitivity of the area. These factors are combined to give the risk of dust impacts.

The highest risk category identified is used to define appropriate, site-specific, mitigation measures. The final stage is to determine whether significant effects are likely. For almost all construction phase activities, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience has shown that this is normally possible.

3 ASSESSMENT METHODOLOGY

3.1 Approach

3.1.1 Key Elements

The approach is consistent with the Environmental Protection United Kingdom (EPUK)/Institute of Air Quality Management (IAQM) Land-Use Planning & Development Control: Planning for Air Quality document, the IAQM Guidance on the assessment of dust from demolition and construction and, where relevant, Defra's Local Air Quality Management Technical Guidance: LAQM.TG (16). The assessment includes the key elements listed below:

- Reference to official government estimates from Defra, publicly available air quality monitoring data for the area,
- Relevant North Ayrshire Council (NAC) air quality review and assessment documents – NAC Progress Report 2021 & NAC Update and Screening Assessment 2015;
- Design Manual for Roads & Bridges (DMRB) Volume 11, Section 3, Part 1, HA207/07 Air Quality is referenced; and,
- A qualitative assessment of likely construction-phase impacts without mitigation and controls in place.

Air quality guidance advises that the organisation engaged in assessing the overall risks should hold relevant qualifications and/or extensive experience in undertaking air quality assessments. The RPS air quality team members involved at various stages of this assessment have professional affiliations that include; Members of the Institute of Air Quality Management (MIAQM) and Chartered Scientist (CSci).

3.1.2 Summary of Pollutants Considered

3.1.2.1 Construction Phase

3.1.2.1.1 Definition of Dust

Refers to all airborne particulate matter (PM) - that is, solid particles that are suspended in air, or have settled out onto a surface after having been suspended in air. The term 'dust' covers all airborne particulates it includes the particulates that give rise to soiling, poor health and environmental damage.

3.1.2.1.2 Definition of Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate matter (PM) is a complex assemblage of non- gaseous material of varied chemical composition. It is categorised by the size of the particle (for example PM_{10} is particles with a diameter of less than 10 microns (mm)). Most PM emissions in Largs are caused by road traffic, with engine emission and tyre and brake wear being the main sources. Construction sites, with high volumes of dust and emissions from machinery are also major sources of local PM pollution, along with fires, including the burning of waste.

3.1.2.1.3 Other Emissions

Regarding exhaust emissions from construction-related vehicles (contractors' vehicles and Heavy Goods Vehicles (HGVs), diggers, and other diesel-powered vehicles), these are unlikely to have a significant impact on local air quality except for large, long-term construction sites - the EPUK/IAQM Land- Use Planning & Development Control: Planning for Air Quality document indicates that air quality assessments should include developments increasing annual average daily Heavy Duty Vehicle (HDV) traffic flows by more than 25 within or adjacent to an AQMA and more than 100 elsewhere. The EPUK/IAQM thresholds are not expected to be exceeded for any individual road during the construction phase of this project; therefore, construction-vehicle exhaust emissions have not been assessed specifically but rather discussed and mitigation measures suggested as best practice.

3.2 Construction Phase – Methodology

3.2.1 Dust and Particulates

Dust is the generic term used to describe particulate matter in the size range 1-75 µm in diameter. Particles greater than 75 µm in diameter are termed grit rather than dust. Dusts can contain a wide range of particles of different sizes. The normal fate of suspended (i.e. airborne) dust is deposition. The rate of deposition depends largely on the size of the particle and its density; together these influence the aerodynamic and gravitational effects that determine the distance it travels and how long it stays suspended in the air before it settles out onto a surface. In addition, some particles may agglomerate to become fewer, larger particles; whilst others react chemically.

The effects of dust are linked to particle size and two main categories are usually considered:

1. PM_{10} particles, those up to 10 µm in diameter, remain suspended in the air for long periods and are small enough to be breathed in and so can potentially impact on health; and,
2. Dust, generally considered to be particles larger than 10 µm which fall out of the air quite quickly andcan soil surfaces (e.g. a car, window sill, laundry). Additionally, dust can potentially have adverse effects on vegetation and fauna at sensitive habitat sites.

The IAQM Guidance on the assessment of dust from demolition and construction sets out 350m as the distance from the site boundary and 50m from the site traffic route(s) up to 500 m of the entrance, within which there could potentially be nuisance dust and PM_{10} effects on human receptors. For sensitive ecological receptors, the corresponding distances are 50 m in both cases. These distances are set to be deliberately conservative.

3.2.2 Human Receptors Definition

A 'human receptor' refers to any location where a person or property may experience the adverse effects of airborne dust or dust soiling, or exposure to particulates over a time period relevant to the air quality objectives, as defined in the Government's technical guidance for Local Air Quality Management. In terms of annoyance effects, this will most commonly relate to dwellings, but may also refer to other premises such as buildings housing cultural heritage collections (e.g. museums and galleries), vehicle showrooms, food manufacturers, electronics manufacturers, amenity areas and horticultural operations (e.g. salad or soft- fruit production).

3.2.3 Sensitivities of People and Property Receptors to Dust

3.2.3.1 High Sensitivity

Principles: Users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods as part of the normal pattern of use of the land.

Indicative Examples: Dwellings, Museums and other culturally important collections. Medium and long- term car parks and car showrooms.

Proposed Development Examples: There are residential properties in close proximity located at Greenock Road and Aubery Crescent. Car parking in the area is associated with commercial operations.

3.2.3.2 Medium Sensitivity

Principles: Users would expect to enjoy a reasonable level of amenity but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.

Indicative Examples: Parks, Places of work

Proposed Development Examples: Vikingar! Leisure Centre and Visitor Attraction located at 40 Greenock Road and Clyde Muirshiel Regional Park.

3.2.3.3 Low Sensitivity

Principles: the enjoyment of amenity would not reasonably be expected; or there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.

Indicative Examples: Playing fields, farmland (unless commercially sensitive horticultural). Footpaths and roads. Short-term car parks.

Proposed Development Examples: There are footpaths in close proximity to the proposed development, along Greenock Road, and Largs Thistle Football Club and Playing fields on Brisbane Road.

3.2.4 Sensitivities of People and Property Receptors to PM_{10}

3.2.4.1 High Sensitivity

Principles: Locations where members of the public are exposed over a time period relevant to the air quality objective (in the case of the 24-hour objective for PM_{10}, a relevant location would be one where individualsmay be exposed for eight hours or more in a day).

Indicative Examples: Residential properties, Schools, hospitals, and residential care homes.

Proposed Development Examples: There are residential properties in close proximity located at Greenock Road and Aubery Crescent.

3.2.4.2 Medium Sensitivity

Principles: Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective (in the case of the 24-hour objective for PM_{10}, a relevant location would be onewhere individuals may be exposed for eight hours or more in a day).

Indicative Examples: Office and shop workers (but generally excludes workers occupationally exposed to PM_{10} as protection is covered by Health and Safety at Work legislation).

Proposed Development Examples: Vikingar! Leisure Centre and Visitor Attraction located at 40 Greenock Road and Clyde Muirshiel Regional Park.

3.2.4.3 Low Sensitivity

Principles: Locations where human exposure is transient exposure.

Indicative Examples: Public footpaths, playing fields, parks. Shopping streets

Proposed Development Examples: There are footpaths in close proximity to the proposed development, along Greenock Road and Largs Thistle Football Club and Playing fields on Brisbane Road.

3.2.5 IAQM Sensitive Ecological Receptors Definition

An 'ecological receptor' refers to any sensitive habitat affected by dust soiling. This includes the direct impacts on vegetation or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g., onforaging habitats). For locations with a statutory designation, e.g., Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), consideration should be given as to whether the particularsite is sensitive to dust, and this will depend on why it has been designated. Some non-statutory sites (i.e., local wildlife sites) and/or locations with very specific sensitivities may also be considered if appropriate. The proposed development is located in an urban/industrial area. The air quality and dust ecological receptors is discussed in detail in section **Error! Reference source not found.**.

3.2.6 Source Pathway Receptor

Concentration-based limit values and objectives have been set for the PM_{10} suspended particle fraction, but no statutory or official numerical air quality criterion for dust annoyance has been set at a UK, Europeanor World

Health Organisation (WHO) level. Construction dust assessments have tended to be risk based, focusing on the appropriate measures to be used to keep dust impacts at an acceptable level.

Consistent with the recommendations in the IAQM dust guidance, a risk-based assessment has been undertaken for the development, using the well-established source-pathway-receptor approach:

1. The dust impact (the change in dust levels attributable to the development activity) at a particular receptor will depend on the magnitude of the dust source and the effectiveness of the pathway (i.e. the route through the air) from source to receptor.
2. The effects of the dust are the results of these changes in dust levels on the exposed receptors, for example annoyance or adverse health effects. The effect experienced for a given exposure depends on the sensitivity of the particular receptor to dust. An assessment of the overall dust effect for the area as a whole has been made using professional judgement taking into account both the change in dust levels (as indicated by the Dust Impact Risk for individual receptors) and the absolute dust levels, together with the sensitivities of local receptors and other relevant factors for the area.

The dust risk categories that have been determined for each of the four activities (demolition, earthworks, construction and trackout) have been used to define the appropriate site-specific mitigation measures based on those described in the IAQM dust guidance. The guidance states that provided the mitigation measures are successfully implemented; the resultant effects of the dust exposure will normally be “not significant”. This assessment does not consider the air quality impacts of dust from any contaminated land. If contaminated land is identified on the site of the proposed development, the impacts will be assessed inother technical discipline reports. This is not detailed further in this report.

Appendix B of this document contains a detailed construction dust assessment.

4 BASELINE AND EXISITING ENVIRONMENT

4.1 North Ayrshire Council Air Quality Information

4.1.1 North Ayrshire Council Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives. North Ayrshire Council currently does not have any AQMAs.

Monitoring in previous years identified that the main air quality issue in North Ayrshire was associated with NO_2 and related to

a. traffic congestion caused by a small section of High Street, Irvine being used as a bus terminus and

b. queuing traffic in New Street, Dalry as a result of traffic lights on the main A737 passing through the town.

With regard to elevated levels of NO_2 in High Street, Irvine, public realm works (streetscape improvements). The changes made would not only move the source of pollution away from the receptor (residential flats above the shops) but will also allow better dilution and dispersion of pollutants. Monitoring to date is encouraging and it would appear that NO_2 concentrations are reducing significantly in the High Street area. This is borne out by both the diffusion tube and automatic monitoring station results. Monitoring will continue in the area and will be reported accordingly in future reports to ensure these changes are constant. The new Dalry Bypass opened on Thursday 30th May 2019, seven months ahead of schedule and traffic congestion through the town has been reduced significantly. It is anticipated that continued monitoring of this area will show a corresponding decrease of NO_2 levels.

4.1.2 North Ayrshire Council 2021 Air Quality Progress Report

4.1.2.1 Description of Local Authority Area

North Ayrshire can be divided roughly into four main regional character classifications based on landscape and topography. Isle of Arran represents a landscape distinct from the mainland, whilst at the same time offering a variety of landscape types that have caused it to be referred to as ‘Scotland in Miniature’. The Inner Firth of Clyde is another distinctive character area that includes the northern coastal fringe and the Cumbrae Islands. Inland from this, the topography is dominated by the Renfrew heights, which cover the northern part of North Ayrshire. These hills narrow towards a point near Ardrossan and are largely unsettled. The final area comprises the northern part of the Ayr Basin that is heavily populated in comparison with the neighbouring areas, with a dense network of roads and settlements.

The major trunk road network within North Ayrshire consists of the A78 coastal route running from Irvine to Largs and the A737 Garnock Valley link to the M8 and Glasgow conurbation. Other major routes are the A736 to Barrhead; and the A71 to Kilmarnock road. North Ayrshire is also well served by the rail network and there are stations on the main Glasgow Central to Ayr line at Dalry, Glengarnock, Kilwinning and Irvine; served by a frequent passenger service. In addition the Largs line continues on from Kilwinning and serves the towns of Stevenston, Saltcoats, Ardrossan, West Kilbride, Fairlie and Largs.

North Ayrshire has commercial ports at Ardrossan and Hunterston; which has a deep sea terminal, and leisure facilities are also available at Largs, Irvine, Saltcoats and Millport. Ferry services connect Ardrossan to Brodick (Arran), Largs to Millport (Cumbrae), and Lochranza to Claonaig in Argyll. Main sources of relevant pollutant exposures are from road traffic vehicles. Areas particularly affected are High Street, Irvine and Townhead Street/New Street, Dalry. Key focus of this and previous reports has been on these areas. The installation of Biomass boilers is becoming popular in commercial, educational and leisure facilities.

4.1.2.2 Purpose of Progress Report

This report provides an overview of air quality in North Ayrshire Council during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Progress Report (APR) is summarises the work being undertaken by North Ayrshire Council to improve air quality and any progress that has been made. This report is not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedance of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

4.1.2.3 Automatic Monitoring Sites

North Ayrshire Council has a fixed ROMON unit containing NO_2 analyser and Beta Attenuation Monitor 1020 for PM_{10} (BAM 1020) is located in High Street, Irvine. This monitoring station has been operational since early 2009 and is the site being used for the triplicate co-location of diffusion tubes. Calibration checks are conducted every 2 weeks on site by Local Authority Officers and collected data is forwarded to Ricardo - AEA who validate and ratify the data. The unit is calibrated by Ricardo - AEA every 6 months. The location of this automatic monitoring site is represented in Figure 4.1 with Table 4.1 details of this site.

Figure 4.1: Automatic Monitoring Site Location

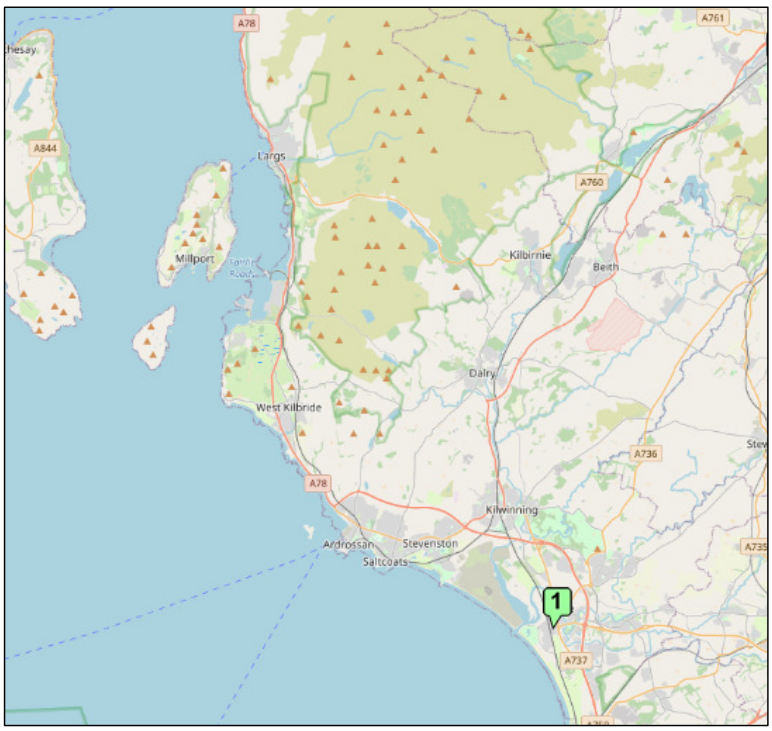

Table 4.1: Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road	Inlet Height (m)
ROM	ROMON	Roadside	232189	638857	NO_2; PM_{10}; $PM_{2.5}$	No	Chemiluminescent; Optical Light Scatter	20	4.88	2.15

***Notes:*

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Data recorded from this automatic monitoring site from 2016 – 2020 is shown below in Table 4.2~~Table 4.2~~ - Table 4.5~~Table 4.5~~.

Table 4.2: 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
ROMON	Roadside	Automatic	-	100	0	0	0	0	0

***Notes:*

Exceedances of the NO_2 1-hour mean objective (200 µg/m^3 not to be exceeded more than 18 times/year) are shown in bold. If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table 4.3: Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
ROMON	Roadside	-	99	15	13	14	14	11

***Notes:*

Exceedances of the PM_{10} annual mean objective of 18 $\mu g/m^3$ are shown in bold. All means have been "annualised" as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table 4.4: 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50$\mu g/m^3$

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
ROMON	Roadside	-	99	0	0	0	0	0

***Notes:*

Exceedances of the PM_{10} 24-hour mean objective (50 $\mu g/m^3$ not to be exceeded more than seven times/year) are shown in bold. If the period of valid data is less than 85%, the 98.1st percentile of 24-hour means is provided in brackets.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table 4.5: Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
ROMON	Roadside	-	99	7	7	8	8	6

***Notes:*

Exceedances of the $PM_{2.5}$ annual mean objective of 10 µg/m^3 are shown in bold. All means have been "annualised" as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

4.1.2.4 Non-Automatic Monitoring Sites

Monitoring of nitrogen dioxide was undertaken at 22 sites using passive diffusion tubes. Tubes were previously relocated during 2008 from long term sites to more important positions within Detailed Assessment areas (High Street, Irvine and Townhead/New Street, Dalry). One location resides in Largs with the location illustrated in Figure 4.2~~Figure 4.2~~. Monitoring details on this site are summarised in Table 4.6~~Table 4.6~~.

Figure 4.2: Non-Automatic Monitoring Site, Largs

Table 4.6: Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
DT20	85 Main Street, Largs	Kerbside	220333	659322	NO_2	N	1.5	0	N	2.0

***Notes:*

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

4.1.2.4.1 Comparison of Monitoring Results with Air Quality Objectives

The monitoring results shown in Table 4.7~~Table 4.7~~ below show that the Diffusion Tube in Largs has not exceeded the 40µg/m^3 annual mean NO_2 objective. Results for the Largs area continue to show levels well in compliance with the air quality objective.

Table 4.7: Annual Mean NO_2 Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	Diffusion Tube Annual Mean NO_2 Monitoring Results				
				2016	2017	2018	2019	2020
DT20	Kerbside	-	83	5	5	5	5	3

***Notes: Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in bold.*

*NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.*

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

The full monthly breaking of NO_2 monitoring Diffusion Tube results for 2020 is presented in Table 4.8~~Table 4.8~~.

Table 4.8: – NO_2 2020 Monthly Diffusion Tube Results (µg/m^3)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1)
DT20	2	4	4.8	4.8	4.4	6.1	2.4	3.7	3.1	2.5	-	-	3.8	3

***Notes:*

North Ayrshire Council have applied a local bias adjustment factor of 0.92 to the 2020 monitoring data.

4.2 Defra Background Levels

The background concentration often represents a large proportion of the total pollution concentration, so it is important that the background concentration selected for the assessment is realistic. EPUK/IAQM guidance highlights public information from Defra and local monitoring studies as potential sources of information on background air quality. LAQM.TG (16) recommends that Defra mapped concentration estimates are used to inform background concentrations in air quality modelling and states that:

"Where appropriate, these data can be supplemented by and compared with local measurements of background, although care should be exercised to ensure that the monitoring site is representative of background air quality".

Defra issued revised 2018 based background maps for NO_X, NO_2, PM_{10} and $PM_{2.5}$ which incorporate updates to the input data used for dispersion or screening modelling. Defra background levels in close proximity to the proposed development is all within the air quality standards for NO_X, NO_2, PM_{10} and $PM_{2.5}$. However, the Defra values are generally very low in comparison to what has been recorded at relevant council's background monitoring site. The six closest Defra locations to the site are shown in Figure 4.3~~Figure 4.3~~ and Table 4.9~~Table 4.9~~ – Table 4.14~~Table 4.14~~ presents a detailed breakdown of the Defra background values.

Figure 4.3: Defra Locations

Table 4.9: Defra Location 1 Background Results (NO_x, NO_2, PM_{10}, $PM_{2.5}$) (µg m^3) 2018-2023

DEFRA Location 1						
X Co-ordinates: 220500				Y Co-ordinates: 660500		
	2018	2019	2020	2021	2022	2023
NO_x	9.32	8.95	8.58	8.43	8.29	8.19
NO_2	7.27	6.99	6.72	6.61	6.51	6.43
PM_{10}	7.58	7.43	7.29	7.21	7.14	7.07
$PM_{2.5}$	5.07	4.95	4.83	4.77	4.72	4.66

Table 4.10: Defra Location 2 Background Results (NO_x, NO_2, PM_{10}, $PM_{2.5}$) (µg m^3) 2018-2023

DEFRA Location 2						
X Co-ordinates: 221500				Y Co-ordinates: 660500		
	2018	2019	2020	2021	2022	2023
NO_x	8.01	7.69	7.37	7.27	7.17	7.10
NO_2	6.30	6.06	5.82	5.75	5.67	5.62
PM_{10}	7.11	6.97	6.83	6.76	6.69	6.61
$PM_{2.5}$	4.75	4.64	4.53	4.47	4.41	4.35

Table 4.11: Defra Location 3 Background Results (NO_x, NO_2, PM_{10}, $PM_{2.5}$) (µg m^3) 2018-2023

DEFRA Location 3						
X Co-ordinates: 220500				Y Co-ordinates: 659500		
	2018	2019	2020	2021	2022	2023
NO_x	24.77	23.80	22.83	22.77	22.73	22.72

DEFRA Location 3						
NO_2	17.24	16.68	16.11	16.06	16.03	16.02
PM_{10}	8.13	7.93	7.72	7.65	7.57	7.50
$PM_{2.5}$	5.48	5.31	5.14	5.09	5.03	4.97

Table 4.12: Defra Location 4 Background Results (NO_x, NO_2, PM_{10}, $PM_{2.5}$) (µg m^3) 2018-2023

DEFRA Location 4						
X Co-ordinates: 221500				Y Co-ordinates: 659500		
	2018	2019	2020	2021	2022	2023
NO_x	9.15	8.79	8.43	8.31	8.20	8.12
NO_2	7.14	6.87	6.61	6.52	6.44	6.38
PM_{10}	7.47	7.32	7.17	7.10	7.02	6.95
$PM_{2.5}$	4.99	4.87	4.75	4.69	4.63	4.57

Table 4.13: Defra Location 5 Background Results (NO_x, NO_2, PM_{10}, $PM_{2.5}$) (µg m^3) 2018-2023

DEFRA Location 5						
X Co-ordinates: 220500				Y Co-ordinates: 658500		
	2018	2019	2020	2021	2022	2023
NO_x	8.93	8.55	8.17	7.99	7.81	7.68
NO_2	6.99	6.71	6.43	6.29	6.16	6.06
PM_{10}	7.43	7.28	7.14	7.06	6.99	6.92
$PM_{2.5}$	4.95	4.84	4.72	4.66	4.60	4.54

Table 4.14: Defra Location 6 Background Results (NO_x, NO_2, PM_{10}, $PM_{2.5}$) (µg m^3) 2018-2023

DEFRA Location 6						
X Co-ordinates: 221500				Y Co-ordinates: 658500		
	2018	2019	2020	2021	2022	2023
NO_x	6.54	6.26	5.99	5.84	5.70	5.58
NO_2	5.20	4.99	4.78	4.67	4.56	4.47
PM_{10}	7.15	7.02	6.89	6.81	6.74	6.67
$PM_{2.5}$	4.77	4.66	4.55	4.49	4.43	4.37

4.3 Integrated Pollution Prevention and Control License Holders

Integrated Pollution Prevention and Control (IPPC) is a regulatory system that employs an integrated approach to control the environmental impacts of certain industrial activities. There are currently no license holders within Largs. The license holders in closest proximity to the proposed development are:

- PPC/A/1008859 - EDF Energy Nuclear Generation Ltd. - Hunterston B Power Station, W Kilbride – approximately 11.7km away.
- PPC/W/0020024 - British Polythene Limited - Berry BPI, Stevenston - approximately 27.2km away.
- PPC/W/0020057 - Highland Meats - Highland Meats, Blakely Rd, Saltcoats - approximately 22.5km away.

4.4 Sensitive Receptors

LAQM.TG (16) describes in detail typical locations where consideration should be given to pollutants defined in the Regulations. Generally, the guidance suggests that all locations 'where members of the public are regularly present' should be considered. At such locations, members of the public will be exposed to pollution over the time that they are present, and the most suitable averaging period of the pollutant needs to be used for assessment purposes. The sensitive receptors are shown in Figure 4.4~~Figure 4.4~~, to include both residential and non-residential receptors.

Figure 4.4: Sensitive Receptors Map

The sensitive receptor ID's and locations are summarised in **Appendix C**. The nearest sensitive receptor to the proposed development is residential receptors ID 13 at 48m

5 ASSESSMENT OF CONSTRUCTION PHASE

5.1 Assessment of Construction Phase

5.1.1 Construction Dust

The type of activities that could cause fugitive dust emissions are demolition; earthworks; handling and disposal of spoil; wind-blown particulate material from stockpiles; handling of loose construction materials; and movement of vehicles, both on and off site. The level and distribution of construction dust emissions will vary according to factors such as the type of dust, duration and location of dust-generating activity, weather conditions and the effectiveness of suppression methods.

The main effect of any dust emissions, if not mitigated, could be annoyance due to soiling of surfaces, particularly windows, cars and laundry. However, it is normally possible, by implementation of proper control, to ensure that dust deposition does not give rise to significant adverse effects, although short-term events may occur (for example, due to technical failure or exceptional weather conditions). The following assessment, using the IAQM methodology, predicts the risk of dust impacts and the level of mitigation that is required to control the residual effects to a level that is “not significant”.

5.1.2 Risk of Dust Impact

5.1.2.1 Source

Initial works will see the partial removal of the existing concrete steps with a rock breaker mounted on small excavator working from the beach. The existing handrail along the promenade will be removed and stored for reuse. Table 5.1~~Table 5.1~~ summaries the dust sources assessed and dust risks.

Table 5.1: Dust Sources Assessed

Source
Demolition – Low
Earthworks – Low
Construction – low
Trackout – Low

5.1.2.2 Pathway and Receptor - Sensitivity of the Area

All earthworks and construction activities are assumed to occur within the site boundary. As such, receptors at distances within 20 m, 50 m, 100 m, 200 m and 350 m of the site boundary have been identified and are illustrated in Figure 5.1~~Figure 5.1~~. The sensitivity of the area has been classified and the results are provided in Table 5.2~~Table 5.2~~ below.

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Figure 5.1: Construction Dust Assessment – Distance Bandings (m) from Site Boundary

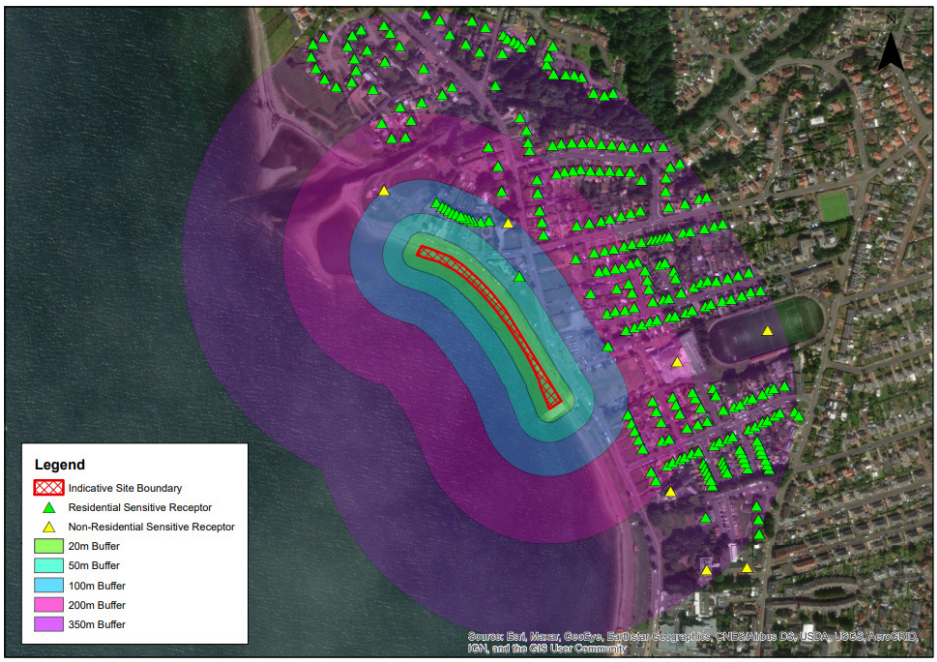


Table 5.2: Sensitivity of the Surrounding Area for Demolition, Earthworks and Construction

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Demolition	Low	1 - 10 high sensitivity receptors located within 50 m of the site boundary.
Dust Soiling	Low	1 - 10 high sensitivity receptors located within 50m of the site boundary.
Human Health	Low	Background annual-mean PM_{10} concentration for the assessment = 8.8 µg.m-3. 1-10 high sensitivity receptors located within 50m of the site boundary and PM_{10} concentrations less than 24 µg.m-3.

The Dust Emission Magnitude for trackout is classified as low and trackout may occur on roads up to 200m from the site. The sensitivity of the area has been classified and the results are provided in Table 5.3~~Table 5.3~~ below.

Table 5.3: Sensitivity of the Surrounding Area for Trackout

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Demolition	Low	10 - 100 high sensitivity receptors located within 200 m of the site boundary.
Dust Soiling	Low	10 - 100 high sensitivity receptors located within 200 m of the site boundary.
Human Health	Low	10 - 100 high sensitivity receptors located within 200 m of the site boundary.

5.1.2.3 Overall Dust Risk

The dust emission magnitude has been considered in the context of the Sensitivity of the Area to give the dust impact risk. Table 5.4~~Table 5.4~~ summarises the dust impact.

Table 5.4: Dust Impact Risk for Demolition, Earthworks, Construction and Trackout

Source	Dust Emission Magnitude	Risk of Dust Impacts
Demolition	Small	Low
Earthworks	Small	Low
Construction	Medium	Low
Trackout	Small	Low

Taking the site as a whole, the overall risk is deemed to be low. The mitigation measures appropriate to a level of risk for the site as a whole are set out in Section 6. Mitigation measures are detailed in this report that will control dust during the construction phases of the proposed development this will reduce the risk to negligible/not significant. Provided this package of mitigation measures (set out in this report) are implemented, the residual construction dust effects will not be significant. The IAQM dust guidance states that;

"For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'." (IAQM, 2014).

The IAQM dust guidance recommends that significance is only assigned to the effect after the activities are considered with mitigation in place.

5.1.3 Construction Vehicles & Plant

Plant and machinery would be used for the construction activities involved in the development of this site. The choice of plant and machinery will be made by the appointed contractor, this is likely to include at least the following:

1. Hydraulic excavators
2. HGV / dumper trucks / cement lorries / skip lorries
3. Tracked bulldozers
4. Road rollers
5. Pneumatic drills / hammers (hand held and on back of excavators)
6. Cement mixers
7. Generators
8. Pumping equipment
9. 'Cherry Pickers' / Mobile Platforms
10. Cranes
11. Works vans and 4WD vehicles

The plant / machinery to be used will be reviewed continuously by the contractor and this list may be updated as required and included in any updated versions of the outline Construction Environmental Management Plan (oCEMP)[1].

[1] The outline Construction Environmental Management Plan (oCEMP) has been submitted as part of supporting documents for the planning application.

6 MITIGATION

6.1 Construction Phase

During the construction phase there will be associated air quality and dust impacts that are typical of developments. Appendix B details a dust management plan for the proposed development.

6.2 Operational Phase

Due to the nature of the development there are no operation mitigation measures required.

7 CONCLUSION

Impacts during the demolition phase, such as dust generation and plant/vehicle emissions, are predicted to be of short duration and only relevant during the demolition phase.

The results of the risk assessment of construction dust impacts undertaken using the IAQM dust guidance, indicates that before the implementation of mitigation and controls, the risk of dust impacts will be 'low'.

Implementation of the mitigation measures described in **Appendix B** will reduce the dust fugitive effects and control emissions during the construction phases of the proposed development.

APPENDICES

Appendix A

Proposed Development Plans

Figure A1: General Arrangement

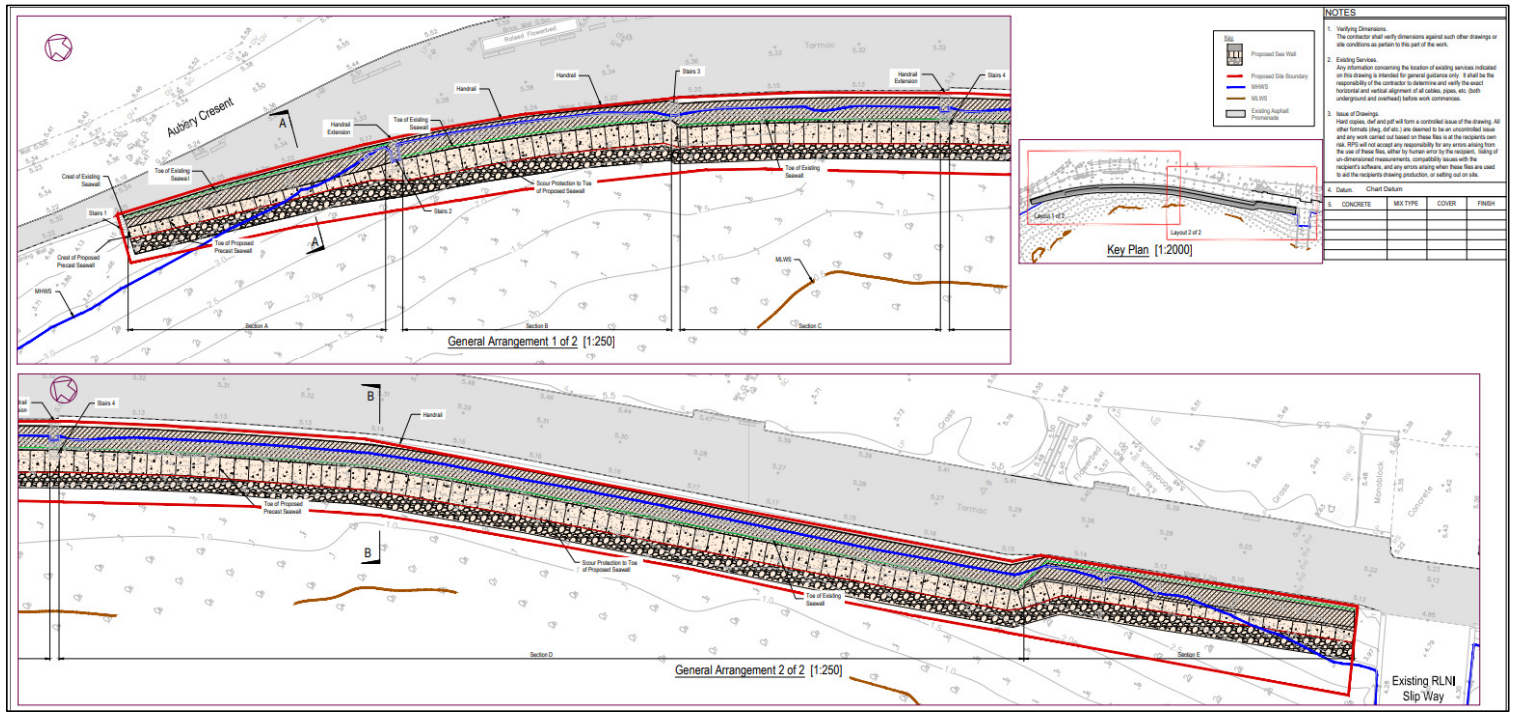


Figure A2: Proposed section for Northern and Southern Section of Seawall

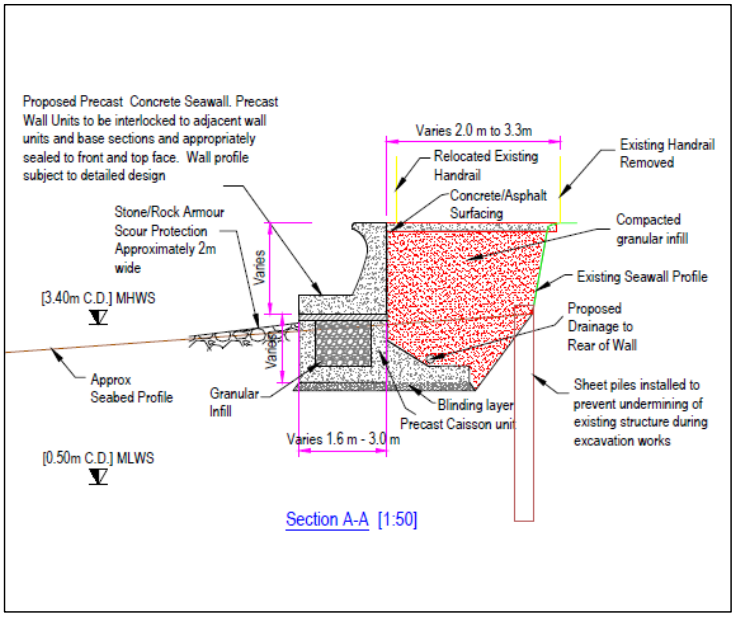
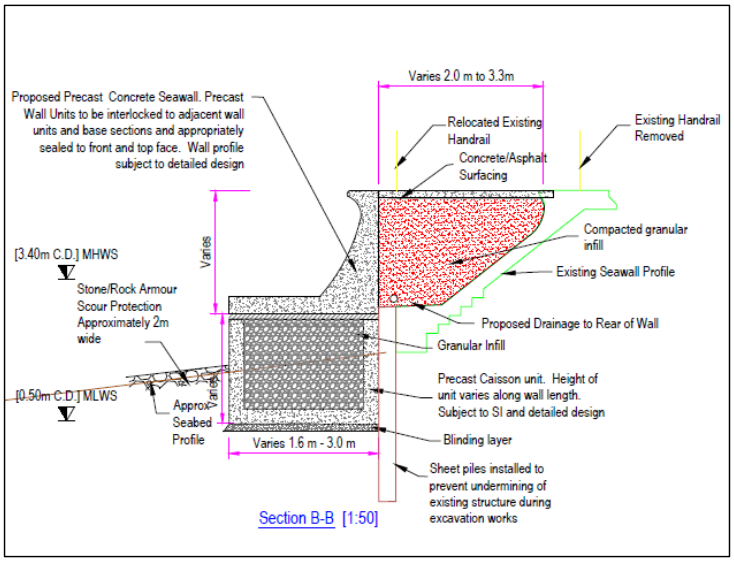


Figure A3: Proposed section for middle section of proposed Seawall



Appendix B

Dust Management Plan (DMP)

Scope of the Plan

The DMP covers all construction activities associated with the Proposed Seawall Replacement Works. The type of activities that could cause fugitive dust emissions are:

- *demolition;*
- *earthworks;*
- *handling and disposal of spoil;*
- *wind-blown particulate material from stockpiles;*
- *handling of loose construction materials; and,*
- *movement of vehicles, both on and off site.*

The level and distribution of construction dust emissions will vary according to factors such as the type of dust, duration and location of dust-generating activity, weather conditions and the effectiveness of suppression methods.

Mitigation Measures

Overview

The following are general good practice measures that will be implemented onsite to control dust and vehicle emissions. The IAQM guidance outlines a number of mitigation measures for reducing impacts of fugitive dust from construction sites. Adoption of a number of these measures at the project site would reduce dust impacts to both personnel working at the site and off-site receptors. It is the responsibility of the Site Manager/Environmental Manager or designated deputy to be fully aware of its contents, to provide relevant training to staff and to ensure that procedures are being implemented to achieve compliance with this DMP. During the hours of operation the site will be supervised by at least one member of staff who is suitably trained and conversant with the requirements of this DMP with respect to:

- Operational controls and visual dust inspection;
- Site maintenance;
- Record keeping; and,
- Emergency action plans.

Communications

With respect to communications, the following will be implemented:

a. Develop and implement a stakeholder communications plan that includes community engagement;

b. Display the **name and contact details of person(s) accountable for air quality and dust issues** on the site boundary. This may be the Site Manager/Environmental Manager;

c. Appropriate training will be provided to all staff to ensure that they are aware of and understand the dust control and other environmental control measures;

d. Display the head or regional office contact information; and,

e. **Annex D** details an Air Quality Summary Checklist that the contractor can use.

To be implemented before works commence on site by the Appointed Contractor.

Site Management

With respect to site management, the following will be implemented:

a. Daily visual inspections of the site and site boundary for evidence of dust depositions will be made. A dust inspection of the site will be undertaken by a suitable person, trained and nominated by the site manager. Increase frequency of site inspections will be undertaken when activities with a high potential to produce dust are being carried out, such as earthworks activities, power tool use and during prolonged windy or dry condition (Please refer to **Annex A** for a visual inspection template/form);

b. Record all dust and air quality complaints (Please see **Annex B**), identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;

c. Make the complaints record (Please see **Annex B**) available to the relevant regulatory authorities when asked;

d. Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in an environmental log book;

e. Avoid site runoff of water or mud;

f. Use covered skips;

g. No bonfires and burning of waste materials on site.

To be implemented during works as required by the Appointed Contractor.

Earthworks

Earthworks are planned as part of the scheme including foundations (and associated excavation of soils and materials), creation of trenches and stockpiling. With respect to earthworks, the following will be implemented:

a. Materials handling should be restricted during adverse weather conditions such as high winds or exceptionally dry spells – depending on outcome of walk over survey **(Annex A)** identifying any potential issues ;

b. Minimise drop heights from loading or handling equipment/materials and use fine water sprays on such equipment wherever appropriate;

c. Methods and equipment will be in place for immediate clean-up of spillages of dusty or potentially dusty materials.

To be implemented during earthworks by the Appointed Contractor.

Construction

With respect to construction, the following will be implemented:

a. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;

b. Ensure bulk cement and other fine powder materials are delivered in enclosed;

c. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust;

d. Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems; and,

e. Cleaning of hard stand areas by personnel only or if required mechanical road sweepers (with water suppressant fitted) to clean any site hard stand area.

To be implemented during construction period by the Appointed Contractor.

Vehicle Movement and Vehicle Emissions

As with any construction site, there are associated vehicle movement, emissions and plant use. With respect to vehicle movement and vehicle emissions, the following will be implemented:

a. Transportation of dusty/fine materials will be conducted in enclosed or sheeted vehicles;

b. Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary;

c. Ensure all vehicles switch off engines when stationary and not in immediate use - no idling vehicles (emissions to air controlled);

d. All plant utilised should be regularly inspected (emissions to air controlled);

e. Visual monitoring of plant will include: Ensuring no black smoke is emitted other than during ignition (emissions to air controlled);

f. Ensuring exhaust emissions are maintained to comply with the appropriate manufacturers limits (emissions to air controlled); and,

g. Vehicle exhausts will be directed away from the ground and other surfaces and preferably upwards to avoid road dust being re-suspended to the air.

To be implemented throughout by the Appointed Contractor.

Conclusion

With suggested mitigation measures in place and adoption of recommendations as detailed, the risk of air quality and dust impact during the construction phase will be controlled and managed by the principal contractor and not result in significant impacts.

All visual inspection records and any recorded complaints will be held at the site offices. The records will be made available on site to the environmental officers of Council/ planning authority representative as requested.

This DMP will be adopted by the appointed contractor and reviewed periodically and also following any incidents on-site, changes in site operations, or if any releases of fugitive dust occur over a prolonged period, which require a change in any part of the DMP.

The updates will be agreed between the Site Manager/Environment Manager and the environmental officers of the Council.

Annex A: Visual Inspection Record Form

At all sites, an inspection for visible dust emissions in the vicinity of the site boundary (internal and external) should be conducted at least once on each working day. The results of this inspection should be clearly recorded in a clear and unambiguous manner. **This form satisfy this recommendation in the IAQM guidance.**

In its most basic form, this assessment will simply involve the nominated representative surveying the site for evidence of dust release. This may include, for example, observing the movement of vehicles, stockpiling and demolition. It should be immediately obvious if such operations are leading to the release of dust emissions and the size and frequency of such releases. Under such circumstances the nominated representative may need to undertake further mitigation as defined in this DMP.

Annex A can be used for the following:

- to carry out pre-project planning by designer and project managers
- to carry out audits by project environmental managers
- to check that all environmental aspects associated with dust have been considered by Local Authority Environmental Health Officers

HAULAGE ROUTES, VEHICLES AND CONSTRUCTION PLANT

Roads, surfaces and public highways

Potential dust source		Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed
1. Haul roads and traffic routes					
2. Vehicle waiting areas and hard standings					
3. Vehicle and wheel washing					
4. Construction and maintenance of unsurfaced roads and verges					
5. Site Traffic	Management				
	Speed				
6. Public roads					
7. Edges of roads and footpaths					
8. Road cleaning					
9. High level walkways and surfaces (scaffold planking and other surfaces)					

HAULAGE ROUTES, VEHICLES AND CONSTRUCTION PLANT

Static and mobile combustion plant emissions

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Visible exhaust smoke				
2. Maintenance				
3. Servicing				
4. Operating time				
5. Exhaust direction				
6. Exhaust heights				
7. Location of plant and equipment				

HAULAGE ROUTES, VEHICLES AND CONSTRUCTION PLANT

Tarmac laying, bitumen surfacing and coating

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Bitumen over-heating				
2. Fume production				
3. Small accidental fires				
4. Housekeeping				
5. Direct application of open flames (torching)				

MATERIALS HANDLING, STORAGE, SPILLAGE AND DISPOSAL

Handling of materials

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Material handling operations				
2. Transport of fine powdery materials				
3. Transport of dusty materials and aggregates				
4. Handling areas				
5. Vehicle loading				
6. Loading materials onto vehicles and conveyors				
7. Chutes, skips and conveyor, transfer points				
8. Conveyor loads				
9. Reducing/preventing dust dispersing - over the site boundary				

MATERIALS HANDLING, STORAGE, SPILLAGE AND DISPOSAL

Storage of powder material

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Bulk cement, bentonite and similar materials				
2. Silos				
3. Accidental spillages when filling or operating silos				
4. Fine, dry materials (less than ~3 mm in particle size)				
5. Dry materials (greater than ~3 mm in particle size diameter)				
6. Storage location				

MATERIALS HANDLING, STORAGE, SPILLAGE AND DISPOSAL

Stockpiles

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Stockpile location				
2. Building stockpiles				
3. Small and short-term stockpiles - protecting from wind erosion				
4. Larger and long-term stockpiles - protecting from wind erosion				

MATERIALS HANDLING, STORAGE, SPILLAGE AND DISPOSAL

Spillages

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Cleaning up				
2. Inspection				
3. Cement powder (and similar)				

MATERIALS HANDLING, STORAGE, SPILLAGE AND DISPOSAL

Burning of waste materials and uprooted foliage

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Disposal method				
2. Combustion method				
3. Incinerator				
4. Supervision				
5. Treated timbers				

SITE PREPARATION AND RESTORATION AFTER COMPLETION

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Earthworks, excavation and digging				
2. Completed earthworks				
3. Storage mounds				
4. Landscaping				
5. Transitory soil mounds				
6. Processing aggregates, crushing and screening				

CONSTRUCTION AND FABRICATION PROCESSES

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Blasting using explosives				
2. Sheeting/screening				
3. Biological materials				
4. Asbestos				
5. Water sprays				
6. Removal of materials from site				
7. Transport of materials				
8. Vehicle routes				

INTERNAL AND EXTERNAL FINISHING AND REFURBISHMENT

Potential dust source	Significance (high, low, medium)	Control measure	Responsibility for Implementation	Observed closed out
1. Painting and decorating				
2. Fitting out - plastering, rendering, decorative finishing, furniture fitting				
3. Installation of electrical systems and plumbing - chasing of walls, soffits and floors				
4. Installation of fire proofing and insulation (usually from man-made mineral fibres eg mineral wools, ceramic, special purpose and continuous filament fibres)				
5. Cleaning processes				

Annex B: Dust Complaint & Assessment Form

DUST COMPLAINT AND ASSESSMENT FORM

PART A: Complaint Details

Date:	Time:		Complaint Received By:	
Name:			Address:	
Contact Phone Numbers:			Possible Source:	
Anonymous Y/N			Is dust occurring now?	
Complaint details (include impacts/effects experienced by complainant):				

PART B: Complainant Location Assessment

Date:	Time:		Assessors Name:	
Person spoken to at complaint location:			Reason for investigation: COMPLAINT/PROACTIVE	
Complaint details (include impacts/effects experienced by complainant):				

INITIAL IMPRESSIONS

Time of the initial impression:		Type of dust:	
Any visible dust deposits:	Y/N	Plume width (if known):	

VISIBLE DUST DEPOSITS

Describe approximate quantities and extent:	
When was surface last cleaned:	Frequency of cleaning:

Describe the appearance of the deposits:			
Colour:		Any odour:	
Shape:		Water soluble	
Size:		Other:	
Crystalline or powdery:			
Hard, Soft:			
Photos taken:	Y/N	Samples taken:	Y/N
Diagram/description of where photos were taken.			
WEATHER DATA			
Wind direction:		Cloud cover:	
Wind Velocity:		Temperature:	
Rainfall in past 24 hours:			

ASSESSMENT **Based on your assessment on this occasion, which of the following applies:**	
	I did not find any dust
	I did find dust and consider it would not be objectionable at any location for any duration or frequency
	I did find dust and consider it would be objectionable if it became continuous
	I did find dust and consider it would be objectionable if it occurred on a regular or frequent basis
	I did find dust and consider it would be objectionable even in periods of short duration
FINAL CHECKLIST	
	Upwind assessment completed. Record details below, if not, detail reason:
	Aerial photo/sketch showing location of assessment and upwind assessment attached
	Are there potential witness statements to obtain YES/NO
REMARKS:	

PART C: Off-site dust and 360º assessment

Assess the dust upwind of the suspected source and if possible conduct a 360º sweep around the source assessing the odour at different points

Other potential sources (check for road works, ploughing, construction activities, unsealed roads, unsealed sites):						Time:	
Site 1							
Wind direction:		Wind strength:		Wind stability:		GPS location	:
Visible dust:				Description of dust:			
Comment							

Site 2							
Wind direction:		Wind strength:		Wind stability:		GPS location	:
Visible dust:				Description of dust:			
Comment:							
Site 3							
Wind direction:		Wind strength:		Wind stability:		GPS location	:
Visible dust:				Description of dust:			
Comment:							
Site sketch if required							

SIGNED BY ASSESSOR:	DATE:
Diagram of suspected source, dust assessment sites and dust plume:	
Comments:	

PART D: Source On-site Investigation

If source of dust identified, visit site, identify yourself and show warrant. Explain the findings of your investigation to staff.

Date:		Time:		Source identified:	
Staff spoken to:				Position:	
Staff contact phone number:					
Current site operations:					
Reason/explanation given for dust:					

Other comments:	

Annex C: Air Quality Summary Checklist

Action	Yes/No	Responsible Personnel	Observed Closeout
1. Have the Local Authority Environmental Health and Planning Departments been contacted and involved?			
2. Do other regulators like the SEPA, HSE etc need to be involved (eg for water run-off)?			
3. Have environmental risk assessments been conducted?			
4. Is the site in a Local Authority Air Quality Management Area (AQMA)?			
5. Is dust monitoring/site inspection required, and what type?			
6. Are dust emission limits to be agreed or imposed?			
7. Have positions of site entrances, haul roads, and speed limits been considered?			
8. Have low dust-producing materials and techniques been specified?			
9. Have costs of dust control equipment and operation been incorporated into project specification and tenders?			
10. Is the specified dust control equipment available on site for immediate use?			
11. Are dust control champions to be appointed?			
12. Have they been given sufficient time and level of responsibility for the task?			
13. Are procedures for site logging of dust generating activities and control measures in place?			

14. Are public relations and information systems in place?			
15. Have the site management team and contractors been trained and informed?			
16. What incentives or penalties are to be in place for staff/contractors?			
Other Notes:			

Appendix C

Sensitive Receptor Location ID's and Distance from Indicative Site Boundary

Table C.1: Residential Receptor Locations and ID's

ID	Easting	Northing	Distance from Boundary (m)
1	219979	660366	69.5
2	219987	660359	66.2
3	219992	660355	65.2
4	219996	660352	63.9
5	220001	660348	62.7
6	220007	660345	63.0
7	220014	660342	62.6
8	220019	660339	62.9
9	220025	660336	63.1
10	220030	660333	63.5
11	220042	660330	68.4
12	220054	660332	77.5
13	220092	660245	48.0
14	220077	660374	124.5
15	220075	660411	153.3
16	220063	660442	174.4
17	219832	660625	344.2
18	219816	660617	342.3
19	219811	660598	327.7
20	219817	660580	308.9
21	219828	660563	288.5
22	219844	660550	270.2
23	219868	660556	267.4
24	219876	660573	280.8
25	219875	660590	297.6
26	219867	660609	318.7
27	219875	660625	331.3
28	219889	660632	335.9
29	219923	660636	335.0
30	219931	660624	322.3
31	219944	660603	301.5
32	219920	660581	280.9
33	219896	660602	304.7
34	219899	660543	246.1
35	219977	660566	265.7
36	220017	660535	242.6
37	220001	660526	229.2
38	219970	660516	214.8
39	219937	660513	210.9
40	219951	660491	189.3
41	219941	660467	165.4
42	219920	660467	167.3
43	219907	660490	193.3

ID	Easting	Northing	Distance from Boundary (m)
44	219988	660646	346.3
45	220007	660637	339.8
46	220020	660614	319.7
47	220043	660598	309.8
48	220062	660584	303.0
49	220055	660630	344.5
50	220074	660620	341.0
51	220081	660532	263.1
52	220096	660579	311.3
53	220141	660594	345.5
54	220100	660606	338.3
55	220106	660599	334.4
56	220114	660595	334.1
57	220121	660592	334.0
58	220126	660585	330.1
59	220196	660210	121.8
60	220215	660130	103.1
61	220133	660304	116.1
62	220179	660264	130.5
63	220218	660178	127.5
64	220231	660181	139.8
65	220245	660181	152.7
66	220259	660184	166.6
67	220258	660205	175.3
68	220254	660220	177.6
69	220236	660214	159.1
70	220245	660152	138.8
71	220257	660154	151.4
72	220269	660157	163.1
73	220281	660161	175.4
74	220292	660163	186.1
75	220236	660025	101.5
76	220240	660011	110.3
77	220244	660000	118.3
78	220249	659986	129.6
79	220254	659972	140.9
80	220284	659982	162.1
81	220295	659984	171.1
82	220285	660010	152.9
83	220279	660026	143.0
84	220274	660042	136.3
85	220305	660045	166.8
86	220309	660034	171.4
87	220313	660020	178.3

ID	Easting	Northing	Distance from Boundary (m)
88	220322	659998	192.0
89	220339	660001	207.0
90	220353	660005	220.2
91	220346	660026	209.2
92	220339	660041	200.5
93	220335	660050	196.6
94	220366	660054	227.8
95	220370	660043	231.7
96	220379	660020	242.8
97	220395	660023	258.3
98	220405	660025	267.8
99	220473	660048	334.4
100	220439	660037	300.8
101	220269	659923	184.7
102	220263	659937	171.0
103	220288	659944	185.4
104	220297	659948	190.1
105	220308	659952	197.5
106	220315	659955	202.5
107	220326	659959	210.4
108	220336	659962	218.1
109	220353	659909	258.3
110	220342	659943	232.2
111	220344	659936	237.1
112	220346	659930	241.5
113	220349	659924	247.3
114	220351	659917	252.5
115	220371	659944	256.8
116	220373	659939	260.9
117	220374	659932	264.9
118	220376	659926	269.9
119	220360	659969	237.2
120	220369	659972	244.4
121	220382	659977	255.1
122	220389	659979	261.6
123	220408	659930	296.3
124	220405	659938	290.0
125	220403	659945	285.5
126	220401	659952	281.3
127	220398	659959	276.7
128	220439	659926	326.7
129	220437	659933	321.8
130	220435	659939	317.7
131	220431	659949	311.1

ID	Easting	Northing	Distance from Boundary (m)
132	220429	659955	307.3
133	220428	659962	303.4
134	220425	659969	299.0
135	220338	659862	276.8
136	220416	659873	331.0
137	220417	659853	343.3
138	220416	659831	356.0
139	220414	659988	283.6
140	220424	659991	292.4
141	220436	659996	302.5
142	220416	660032	278.1
143	220424	660034	285.8
144	220448	660043	309.5
145	220456	660046	318.2
146	220443	659998	309.6
147	220454	660004	319.9
148	220462	660008	327.2
149	220485	660008	349.4
150	220490	660001	355.4
151	220311	660165	204.0
152	220319	660166	211.8
153	220336	660170	228.3
154	220345	660172	238.1
155	220365	660176	257.9
156	220374	660179	266.6
157	220391	660182	283.4
158	220405	660184	296.6
159	220421	660187	312.7
160	220434	660191	326.4
161	220449	660193	340.8
162	220288	660190	194.6
163	220284	660209	199.7
164	220282	660223	204.4
165	220280	660237	208.5
166	220269	660251	205.4
167	220260	660249	195.9
168	220247	660245	182.5
169	220236	660244	172.9
170	220222	660242	159.0
171	220212	660242	149.7
172	220207	660271	158.1
173	220223	660272	173.1
174	220236	660274	186.1
175	220252	660276	201.3

ID	Easting	Northing	Distance from Boundary (m)
176	220265	660278	213.5
177	220279	660280	227.0
178	220294	660281	240.7
179	220300	660282	246.8
180	220307	660282	253.1
181	220314	660284	259.8
182	220320	660284	265.9
183	220342	660289	287.1
184	220352	660290	297.0
185	220374	660292	317.7
186	220389	660295	331.8
187	220402	660297	344.8
188	220304	660192	209.8
189	220312	660193	218.2
190	220303	660244	232.3
191	220311	660246	240.3
192	220323	660232	244.8
193	220325	660222	242.0
194	220331	660200	237.5
195	220351	660207	258.5
196	220362	660212	271.0
197	220372	660214	281.0
198	220385	660212	291.7
199	220402	660215	307.9
200	220418	660218	324.1
201	220435	660221	339.8
202	220185	660313	162.4
203	220203	660315	179.1
204	220221	660317	195.2
205	220235	660319	207.4
206	220252	660321	223.1
207	220266	660325	237.0
208	220281	660327	250.6
209	220324	660329	289.2
210	220348	660331	312.1
211	220370	660338	334.2
212	220381	660338	344.5
213	220346	660393	341.1
214	220331	660389	326.4
215	220323	660372	310.7
216	220321	660353	298.4
217	220286	660372	280.2
218	220272	660386	275.7
219	220254	660388	263.4

ID	Easting	Northing	Distance from Boundary (m)
220	220240	660390	253.6
221	220226	660392	243.4
222	220211	660393	233.0
223	220197	660396	224.5
224	220186	660395	215.2
225	220173	660395	205.6
226	220161	660393	195.9
227	220133	660322	127.5
228	220131	660340	138.4
229	220131	660366	155.2
230	220132	660386	169.6
231	220323	660420	337.2
232	220300	660420	318.4
233	220279	660423	304.8
234	220262	660426	293.4
235	220247	660429	283.7
236	220231	660431	273.2
237	220216	660434	264.4
238	220203	660436	255.5
239	220188	660437	245.2
240	220172	660437	234.4
241	220158	660435	223.8
242	220124	660431	199.0
243	220122	660443	206.9
244	220122	660461	220.9
245	220114	660481	233.5
246	220256	660505	341.7
247	220242	660503	330.3
248	220226	660508	323.3
249	220211	660533	332.6
250	220200	660537	328.5
251	220188	660539	322.8
252	220169	660541	313.9
253	220161	660556	322.1
254	220164	660568	333.4
255	220172	660583	350.9

Table C.2: Non-Residential Receptor Locations and ID's

Sensitive Receptors	Easting	Northing	Distance to Site Boundary (m)
1	220082	660328	92.7
2	220317	660096	183.3
3	220454	660135	326.4
4	220290	659905	211.2
5	220334	659785	332.4
6	220396	659782	372.1

Sensitive Receptors	Easting	Northing	Distance to Site Boundary (m)
7	219901	660391	100.5

AIR QUALITY (DUST) IMPACT ASSESSMENT

2022-07-21

NI 2523

F01

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