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AIR QUALITY ASSESSMENT

PROPOSED CHANGES TO THE CURRENTLY OPERATIONAL FACILITY SAXON BRICKWORKS, WHITTLESEY

Client: Johnsons Aggregates and Recycling Ltd

REPORT REF: P4648-R3-V3

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JOHNSONS AGGREGATES AND RECYCLING LTD

ENVIRONMENTAL PERMIT VARIATION
SAXON BRICKWORKS, WHITTLESEY

AIR QUALITY ASSESSMENT

CONTENTS

APPENDICES

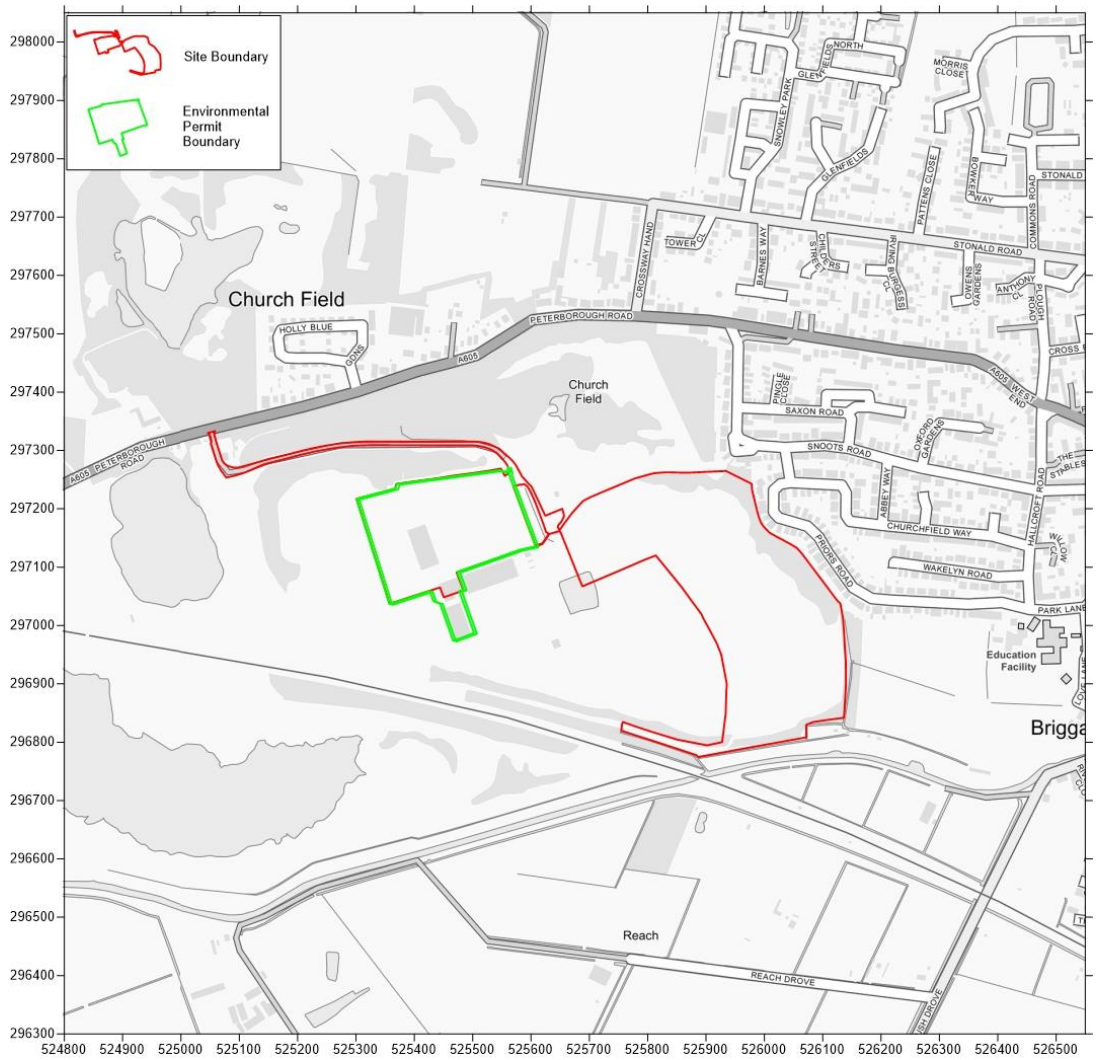
1 INTRODUCTION

1.1.1 NoiseAir Limited has been commissioned to undertake an Air Quality Assessment (AQA) to support an Environmental Permit Variation Application for an existing Incinerator Bottom Ash (IBA) and construction and demolition (C&D) waste management facility at Saxon Brickworks, Whittlesey.

1.1.2 Operations at the facility may have the potential to result in adverse air quality impacts at sensitive locations. As such, an AQA was undertaken in order to determine baseline conditions at the site, assess potential impacts associated with the scheme and identify any requirement for mitigation.

1.2 Site Location and Context

1.2.1 The site is located at the former Saxon Brickworks, off Peterborough Road, Whittlesey, at approximate National Grid Reference (NGR): 525501, 297160. **Figure 1** details the location of the site.



1.2.2 The existing site operates as a recycling facility managing IBA and C&D waste for exportation. The extant Environmental Permit (reference: EPR/DP3131NM) allows for management of up to 300,000-tonnes of material per annum. An Air Quality Assessment (reference: P4648-R2-V1) was produced to support the application for this Permit. **The conclusions indicated that impacts as a result of the construction and operation of the site were predicted to be not significant**.

1.2.3 The Environmental Permit Variation Application seeks to increase the permitted capacity of the plant from a total of 300,000 tonnes per year (250,000 tonnes of IBA and 50,000 tonnes of C&D waste) to 614,000 tonnes per year comprising 460,000 tonnes per year of imported IBA and increase in the throughput of C&D waste to circa 154,000 tonnes per year. An AQA has therefore been undertaken to consider potential impacts associated with atmospheric emissions from the site. This is provided in the following report.

2 LEGISLATION AND POLICY

2.1 Legislation - Air Quality

2.1.1 The Air Quality Standards Regulations (2010) and subsequent amendments include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide (NO_2);
- Sulphur dioxide (SO_2);
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM_{10});
- Particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$);
- Benzene; and,
- Carbon monoxide.

2.1.2 Air Quality Target Values were also provided for several additional pollutants. It should be noted that the AQLV for $PM_{2.5}$ stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

2.1.3 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 2023[1]. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

2.1.4 The Environmental Improvement Plan 2023[2] was published in January 2023, providing long term and Interim Targets in order to reduce population exposure to $PM_{2.5}$. The concentration target for 2040 was subsequently adopted in the Environmental Targets (Fine Particulate Matter) (England) Regulations (2023).

2.1.5 **Table 1** presents the AQOs and Interim Target for pollutants considered within this assessment.

1 AQS: Framework for Local Authority Delivery, DEFRA, 2023.
2 Environmental Improvement Plan 2023, DEFRA, 2023.

Table 1: Air Quality Objectives		
Pollutant	**Concentration (µg/m^3**	**Averaging Period**
NO_2	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM_{10}	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
$PM_{2.5}$	12	Annual mean, Interim Target to be achieved by end of January 2028

2.2 Local Air Quality Management

2.2.1 LAs are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan, the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Industrial Pollution Control Legislation

2.3.1 Atmospheric emissions from industrial activities, including waste storage and processing, are controlled in England through the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments. The extant facility operates in accordance with an Environmental Permit (reference: EPR:DP3131NM), which authorises the relevant activities.

2.3.2 The variation application process will require detailed consideration of potential atmospheric emissions as a result of the changes to operations and associated impacts at sensitive locations in the vicinity of the facility. In accordance with the provisions of the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, any Environmental Permit Variation which is subsequently issued for the operational changes at the facility will include appropriate conditions to restrict environmental impacts beyond the boundary of the site. These will help to limit the potential for any effects as a result of atmospheric emissions, including dust and odour, from the relevant activities.

3 METHODOLOGY

3.1 Introduction

3.1.1 The operation of the facility has the potential to cause air quality impacts. These have been assessed in accordance with the following methodology.

3.2 Dust Emissions

Introduction

3.2.1 There is the potential for fugitive dust emissions to occur as a result of the delivery, storage and processing of IBA and C&D waste. Vehicle movements also have the potential to result in the re-suspension of dust from road and site surfaces. These impacts have been assessed using the following methodology. This has been derived in part from the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1'[3] and professional judgement. It is noted that the IAQM document provides guidance for the assessment of impacts associated with mineral extraction sites, rather than waste recycling facilities. However, it contains useful research on dust emissions, similar to those that may occur from waste management, and was therefore considered a suitable source of information for this assessment in lieu of specific industry guidance.

3.2.2 The IAQM guidance[4] was utilised in order to provide consistency between the Planning and the Environmental Permit Variation applications. It is acknowledged that this methodology includes determination of significance which is not directly applicable to permitting. However, it is considered a valid approach to Risk Assessment as required by the Environment Agency (EA) for consideration of potential impacts and was therefore deemed suitable for a project of this nature.

3.2.3 The Source-Pathway-Receptor connection presents the hypothetical relationship between the source of the pollutant, the pathway by which exposure might occur, and the receptor that could be adversely affected. The dust impact at relevant receptors was assessed using this concept.

3.2.4 The following two potential impacts may occur as a result of fugitive dust emissions:

- Disamenity impacts - Caused by larger particles that may be visible to the naked eye but are not thought to cause health effects. They may cause disamenity through soiling and staining when deposition occurs on window ledges, cars and laundry; and,

[3] Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.
[4] Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.

- Health impacts - Caused by PM_{10} which can remain suspended in air for long periods of time. As the particulates are fine enough to be inhaled, the potential for health effects increases.

3.2.5 The methodology used for the assessment of disamenity and health impacts is detailed below.

Site Characteristics and Baseline Conditions

3.2.6 The characteristics of the proposed site and surrounding area were initially defined through consideration of the following factors:

- Extent of the site including boundary;
- Existing site operations;
- Type and location of processing activities;
- Method of materials handling;
- Location of storage areas and stockpiles; and,
- Location and number of access routes.

Disamenity Dust Assessment

3.2.7 The potential for disamenity from fugitive dust emissions was assessed by first allocating the site risk category based on two factors:

- The potential for residual source emissions; and,
- The source-pathway effectiveness.

3.2.8 These are outlined further below.

Estimation of Residual Source Emissions

3.2.9 The scale and nature of the works taking place at a facility determines the level of residual dust emissions from fugitive sources. The following activities at waste recycling plants are likely to have the greatest potential for dust emissions:

- Material handling;
- Material processing;
- Stockpiling/exposed surfaces; and,
- Off-site transportation.

3.2.10 **Table 2** outlines the criteria used to categorise the residual source emissions for these activities.

Table 2: Dust - Magnitude of Residual Source Emissions		
Magnitude	**Activity**	**Criteria**
Large	Materials Handling	More than 10 loading vehicles within 50m of a site boundary Transferring material of high dust potential and/or low moisture content on dry, poorly surfaced ground
	Material Processing	Processing more than 1,000,000tpa of material
	Stockpiles/Exposed Surfaces	Total exposed area more than 10ha in an area exposed to high wind speeds Located less than 50m from the site boundary Material production more than 1,000,000tpa
	Off-Site Transportation	More than 200 Heavy Goods Vehicle (HGV) movements in any one day on unsurfaced site access roads less than 20m in length
Medium	Materials Handling	5 to 10 loading vehicles between 50m and 100m of a site boundary
	Material Processing	Processing between 200,000tpa and 1,000,000tpa of material
	Stockpiles/Exposed Surfaces	Total exposed area between 2.5ha and 10ha in an area exposed to high wind speeds Located 50m to 100m from the site boundary
	Off-Site Transportation	Between 25 and 200 HGV movements in any one day
Small	Materials Handling	Less than 5 loading vehicles, more than 100m from a site boundary Transferring material of low dust potential and/or high moisture content
	Material Processing	Fixed plant with effective design in dust control Processing less than 200,000tpa of material
	Stockpiles/Exposed Surfaces	Total exposed area of less than 2.5ha Located more than 100m from the site boundary Material production less than 200,000tpa
	Off-Site Transportation	Less than 25 HGV movements per day Paved surfaced site access road more than 50m in length Effective HGV cleaning facilities and procedures

3.2.11 The guidance recommends the consideration of the following additional factors when determining the source emission magnitude:

- The likely effectiveness of the dust control measures incorporated into the design of the submitted scheme;
- Other mitigation measures applied to reduce or eliminate dust; and,
- The meteorological conditions that can promote or inhibit the raising of dust at source.

3.2.12 These factors were considered in the undertaking of the assessment.

Estimation of Pathway Effectiveness

3.2.13 The primary factor influencing the pathway is the distance between the sensitive receptor and the dust sources. However, other factors can cause a higher or a lower category to be assigned. These factors include:

- Orientation of receptors relative to the prevailing wind direction; and,
- Topography, terrain and physical features.

3.2.14 **Table 3** provides the criteria for determining the frequency of potentially dusty winds, based on twelve 30˚ wind direction sectors.

Table 3: Dust - Categorisation of Frequency of Potentially Dusty Winds	
Frequency Category	**Criteria**
Infrequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are less than 5%
Moderately frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are between 12% and 20%
Very frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are greater than 20%

3.2.15 The criteria used to categorise the distance from each receptor to the source is provided in **Table 4**.

Table 4: Dust - Categorisation of Receptor Distance from Source	
Category	**Criteria**
Distant	Receptor is between 200m and 400m from the dust source
Intermediate	Receptor is between 100m and 200m from the dust sources
Close	Receptor is less than 100m from the dust source

3.2.16 The pathway effectiveness was classified using the frequency of potentially dusty winds from **Table 3** and the receptor distance from source from **Table 4**, as shown in **Table 5**.

Table 5: Dust - Pathway Effectiveness				
Category	**Frequency of Potentially Dusty Winds**			
	Infrequent	**Moderately Frequent**	**Frequent**	**Very Frequent**
Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

Estimation of Dust Impact Risk

3.2.17 The residual source emission and source-pathway effectiveness were combined to predict the dust impact risk at individual receptor locations, as shown in **Table 6**.

Table 6: Dust - Estimation of Dust Impact Risk			
Pathway Effectiveness	**Residual Source Emissions**		
	Small	**Medium**	**Large**
Highly Effective Pathway	Low	Medium	High
Moderately Effective Pathway	Negligible	Low	Medium
Ineffective pathway	Negligible	Negligible	Low

Estimation of Dust Effect Magnitude

3.2.18 The predicted dust impact risk was considered with the sensitivity of the receptor to give the likely magnitude of effect. **Table 7** outlines the criteria for determining sensitivity to dust soiling effects.

Table 7: Dust - Sensitivities of People to Dust Soiling Effects	
Receptor Sensitivity	**Criteria**
High	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 include dwellings, medium and long term car parks and showrooms

Table 7: Dust - Sensitivities of People to Dust Soiling Effects	
Medium	Users would expect to enjoy a reasonable level of amenity, but would not be reasonably expected to enjoy the same level of amenity as 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 continuously or regularly for extended periods, as part of the normal pattern of use of the land Indicative examples include parks and places of work
Low	The enjoyment of amenity would not reasonably be expected; or, There is property that would not reasonably be expected to be diminished in the 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 include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads

3.2.19 **Table 8** outlines the criteria for determining the sensitivity of ecological receptors.

Table 8: Dust - Sensitivities of Ecological Designations to Dust Soiling Effects	
Receptor Sensitivity	**Criteria**
High	Locations with an international designation and the designated features may be affected by dust soiling Locations where there is a community of a particularly dust sensitive species Indicative examples include a Special Area of Conservation designed for acid heathlands adjacent to a facility releasing alkaline dusts
Medium	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown Indicative examples include SSSIs or local wildlife site with very specific sensitivities
Low	Locations with a local designation where the features may be affected by dust deposition Indicative examples include Local Nature Reserves, Ancient Woodland or County Wildlife Site (CWS) with dust sensitive features

3.2.20 The likely effect at each receptor was determined from the dust impact risk in **Table 6** and the receptor sensitivities in **Table 7** and **Table 8**, as shown in **Table 9**.

Table 9: Dust - Descriptors for Magnitude of Dust Effects			
Risk	**Receptor Sensitivity**		
	Low	**Medium**	**High**
High	Slight	Moderate	Substantial
Medium	Negligible	Slight	Moderate
Low	Negligible	Negligible	Slight

Table 9: Dust - Descriptors for Magnitude of Dust Effects			
Negligible	Negligible	Negligible	Negligible

3.2.21 An estimation of the overall effect from dust deposition on the surrounding area, taking into account the magnitude of effects at different receptors and the number of receptors that experience the different effects, is the last step in the assessment.

3.2.22 The IAQM guidance[5] states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is **moderate** or **substantial**, the effect is likely to be considered **significant**, whilst if the effect is **slight** or **negligible**, the impact is likely to be considered **not significant**. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**. This has been considered to determine the overall significance of potential dust effects associated with the facility.

3.2.23 The IAQM guidance recognises that assessment of dust requires some degree of professional judgement[6]. Qualitative methodologies such as those utilised within this report provide guidance for assessing potential impacts. However, professional judgement should be exercised in order to take account of the specific details which are unique to each facility. This has been considered as necessary throughout the assessment.

Human Health Receptor Assessment

3.2.24 If human receptors are identified within 1km of a waste recycling site, then consideration of the effect of potential increases in PM_{10} concentrations should be provided. **Table 10** outlines the criteria for determining receptor sensitivity.

Table 10: Dust - Sensitivities of Human Receptors to Increases in PM_{10} Concentrations	
Receptor Sensitivity	**Criteria**
High	Locations where members of the public are exposed over a long time period relevant to the air quality objective for PM_{10} Indicative examples include residential properties, hospitals, schools and residential care homes
Medium	Locations where people are occupationally exposed over a full working day Indicative examples include offices, warehouses and industrial units
Low	Locations where human exposure is transient Indicative examples include public footpaths, playing fields, parks and shopping streets

5 Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.
6 Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.

3.2.25 Initial assessment should determine the existing background ambient concentration of PM_{10} in the vicinity of the site. If the annual mean concentration is less than 17µg/m^3, then the IAQM guidance[7] states that emissions from a minerals facility are unlikely to lead to exceedences of the relevant AQOs. As such, impacts are considered **not significant** and further assessment is not considered necessary. Emissions of PM_{10} from waste recycling are anticipated to be significantly lower than from quarrying and associated activities. As such, this screening criteria has been utilised for the proposed scheme to provide a worst-case assessment.

3.3 Odour Emissions

Introduction

3.3.1 Odour emissions from the site have the potential to cause impacts at sensitive locations. The potential risk of adverse effects has therefore been assessed using the IAQM 'Guidance on the Assessment of Odour for Planning' document[8], as summarised in the following Sections.

Background

3.3.2 The basic concept of risk assessment is that the overall risk depends on the probability of an event occurring together with the likely consequences if it was to occur. For odour assessments the probability can be considered as the likelihood of exposure (impact), and the consequence can be considered to be the effect on the receptor if that exposure (impact) took place. These two facets can be summarised by the Source-Pathway-Receptor concept, as introduced in Section 3.2.

3.3.3 Behind the Source-Pathway-Receptor concept is the fundamental relationship:

Effect = Dose x Response

3.3.4 In the specific case of odour assessments, the dose can be considered equivalent to the odour exposure, or impact. This will be determined by FIDO of the FIDOL factors (also stated as FIDOR in EA guidance H4[9]). These are described by the IAQM as follows:

- Frequency - how often an individual is exposed to odour;
- Intensity - the individual's perception of the strength of the odour;
- Duration - The overall duration that individuals are exposed to an odour over time;

7 Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.
8 Guidance on the Assessment of Odour for Planning, IAQM, 2018.
9 H4: Odour Management, EA, 2011.

- Odour unpleasantness - Odour unpleasantness describes the character of an odour as it relates to the 'hedonic tone' (which may be pleasant, neutral or unpleasant) at a given odour concentration/ intensity. This can be measured in the laboratory as the hedonic tone, and when measured by the standard method and expressed on a standard nine-point scale it is termed the hedonic score; and,
- Location - The type of land use and nature of human activities in the vicinity of an odour source. Tolerance and expectation of the receptor. The 'Location' factor can be considered to encompass the receptor characteristics, receptor sensitivity, and socio-economic factors.

3.3.5 It is important to note that even infrequent emissions may cause loss of amenity if odours are perceived to be particularly intense or offensive.

Risk Assessment Procedure

3.3.6 The first step in the assessment is to estimate the odour generating potential of the site activities. This is termed the Source Odour Potential, which takes into account three factors:

- The scale (magnitude) of the release from the odour source, taking into account the effectiveness of any odour control or mitigation measures that are already in place. This involves judging the relative size of the release rate after mitigation and taking account of any pattern of release (e.g. intermittency);
- How inherently odorous the compounds are. In some cases it may be known whether the release has a low, medium or high Odour Detection Threshold (ODT). This is the concentration at which an odour becomes detectable to the human nose. In most instances the odours released by a source will be a complex mixture of compounds and the detectability will not be known. However, for some industrial processes the odour will be due to one or a small number of known compounds and the detection thresholds will be a good indication of whether the release is highly odorous or mildly odorous; and,
- The relative pleasantness/unpleasantness of the odour.

3.3.7 Using the example risk ranking in **Table 11**, the Source Odour Potential can be categorised as small, medium or large.

Table 11: Odour - Source Odour Potential

Source Odour Potential	Comments
Large	**Magnitude** - Larger Environmentally Permitted processes of odorous nature or large Sewage Treatment Works (STWs); materials usage hundreds of thousands of tonnes/m^3 per year; area sources of thousands of m^2. The

Table 11: Odour - Source Odour Potential	
	compounds involved are very odorous (e.g. mercaptans), having very low ODTs where known **Unpleasantness** - processes classed as "Most offensive" in EA Guidance H4[10]; or (where known) compounds/odours having unpleasant (-2) to very unpleasant (-4) hedonic score **Mitigation/control** - open air operation with no containment, reliance solely on good management techniques and best practice
Medium	**Magnitude** - smaller Environmentally Permitted processes or small STWs; materials usage thousands of tonnes/m^3 per year; area sources of hundreds of m^2. The compounds involved are moderately odorous **Unpleasantness** - processes classed in EA Guidance H4[11] as "Moderately offensive"; or (where known) odours having neutral (0) to unpleasant (-2) hedonic score **Mitigation/control** - some mitigation measures in place, but significant residual odour remains
Small	**Magnitude** - falls below Environmental Permit Part B threshold; materials usage hundreds of tonnes/m^3 per year; area sources of tens m^2. The compounds involved are only mildly odorous, having relatively high ODTs where known **Unpleasantness** - processes classed as "Less offensive" in EA Guidance H4[12]; or (where known) compounds/odours having neutral (0) to very pleasant (+4) hedonic score **Mitigation/control** - effective, tangible mitigation measures in place leading to little or no residual odour

3.3.8 The next step is to estimate the effectiveness of the pollutant pathway as the transport mechanism for odour through the air to the receptor, versus the dilution/dispersion in the atmosphere. Any factor that increases dilution and dispersion of the plume as it travels from source to receptor will reduce the concentration at the end point, and hence reduce exposure. Important factors for consideration are:

- The distance between sensitive receptors and the odour source;
- Whether receptors are downwind with respect to the prevailing wind direction. Odour episodes often tend to occur during stable atmospheric conditions with low wind speed, which gives poor dispersion and dilution. Receptors close to the source in all directions can be affected under these conditions. When circumstances are not calm, it will be the downwind receptors that are affected. As such, receptors that are downwind with respect to the prevailing wind direction tend to be at higher risk of odour impact;
- The effectiveness of the point of release in promoting good dispersion e.g. releasing emissions from a high stack will increase the pathway, dilution and dispersion; and,

10 H4: Odour Management, EA, 2011.
11 H4: Odour Management, EA, 2011.
12 H4: Odour Management, EA, 2011.

- The topography and terrain between the source and receptor. The presence of topographical features such as hills and valleys, or urban terrain features such as buildings, can affect air flow and therefore increase, or inhibit, dispersion and dilution.

3.3.9 Using the example risk ranking in **Table 12**, the pollutant pathway from source to receptor can be categorised as **ineffective**, **moderately effective** or **highly effective**.

Table 12: Odour - Pathway Effectiveness	
Pathway Effectiveness	**Comments**
Highly effective	**Distance** - receptor is adjacent to the source/site; distance well below any official set-back distances **Direction** - high frequency (%) of winds from source to receptor, or, qualitatively, receptors downwind of source with respect to prevailing wind **Effectiveness of dispersion/dilution** - open processes with low-level releases, e.g. lagoons, uncovered effluent treatment plant, landfilling of putrescible wastes
Moderately effective	**Distance** - receptor is local to the source **Where mitigation relies on dispersion/dilution** - releases are elevated, but compromised by building effects
Ineffective	**Distance** - receptor is remote from the source; distance exceeds any official set-back distances **Direction** - low frequency (%) of winds from source to receptor, or, qualitatively, receptors upwind of source with respect to prevailing wind **Where mitigation relies on dispersion/dilution** - releases are from high level (e.g. stacks, or roof vents greater than 3m above ridge height) and are not compromised by surrounding buildings

3.3.10 The sensitivity of the receiving receptor is defined based on the criteria shown in **Table 13.**

Table 13: Odour - Receptor Sensitivity	
Sensitivity	**Description**
High	Surrounding land where: • Users can reasonably expect enjoyment of a high level of amenity; and, • People would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land Examples may include residential dwellings, hospitals, schools/education and tourist/cultural
Medium	Surrounding land where: • 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, • People would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land Examples may include places of work, commercial/retail premises and playing/recreation fields

Table 13: Odour - Receptor Sensitivity	
Sensitivity	**Description**
Low	Surrounding land where: • The enjoyment of amenity would not reasonably be expected; or, • There is transient exposure, where the people would reasonably be expected to present only for limited periods of time as part of the normal pattern of use of the land Examples may include industrial use, farms, footpaths and roads

3.3.11 The estimates of Source Odour Potential and Pathway Effectiveness are considered together to predict the risk of odour exposure (impact) at the receptor location, as shown by the matrix in **Table 14**.

Table 14: Odour - Risk of Exposure			
Pathway Effectiveness	**Source Odour Potential**		
	Small	**Medium**	**Large**
Highly Effective	Low	Medium	High
Moderately Effective	Negligible	Low	Medium
Ineffective	Negligible	Negligible	Low

3.3.12 The final step is to determine the significance of odour effect at the specified receptor location through the interaction between sensitivity and risk, as outlined in **Table 15.**

Table 15: Odour - Significance of Effect			
Risk of Odour Exposure	**Receptor Sensitivity**		
	Low	**Medium**	**High**
High	Slight	Moderate	Substantial
Medium	Negligible	Slight	Moderate
Low	Negligible	Negligible	Slight
Negligible	Negligible	Negligible	Negligible

3.3.13 The IAQM guidance[13] states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is **moderate** or **substantial**, the effect is likely to be considered **significant**, whilst if the effect is **slight** or **negligible**, the impact is likely to be considered **not significant**. It should be noted that this is a binary

[13] Guidance on the Assessment of Odour for Planning, IAQM, 2018.

judgement of either it is **significant** or it is **not significant**. This has been considered to determine the overall significance of potential odour effects associated with the facility.

4 BASELINE

4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the site were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

4.2 Local Air Quality Management

4.2.1 As required by the Environment Act (1995), as amended by the Environment Act (2021), Fenland District Council (FDC) has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO_2, 24-hour mean concentrations of PM_{10} and 15-minute mean concentrations of SO_2 are above the AQOs within the council's administrative extents. As such, four AQMAs have been declared. The closest of these to the site has been designated due to elevated levels of SO_2 and is described as follows:

"Whittlesey AQMA SO_2 - Pedestrian transport routes west and northwest and an area of residential and public spaces to the east of Whittlesey brickworks."

4.2.2 The site is adjacent to the AQMA. However, the facility does not form a significant source of SO_2. As such, the designation has not been considered further in the context of the assessment.

4.2.3 FDC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

4.3 Air Quality Monitoring

4.3.1 Monitoring of pollutant concentrations is undertaken by FDC throughout their area of jurisdiction. Recent results recorded in the vicinity of the site are shown in **Table 16**.

Table 16: Monitoring Results

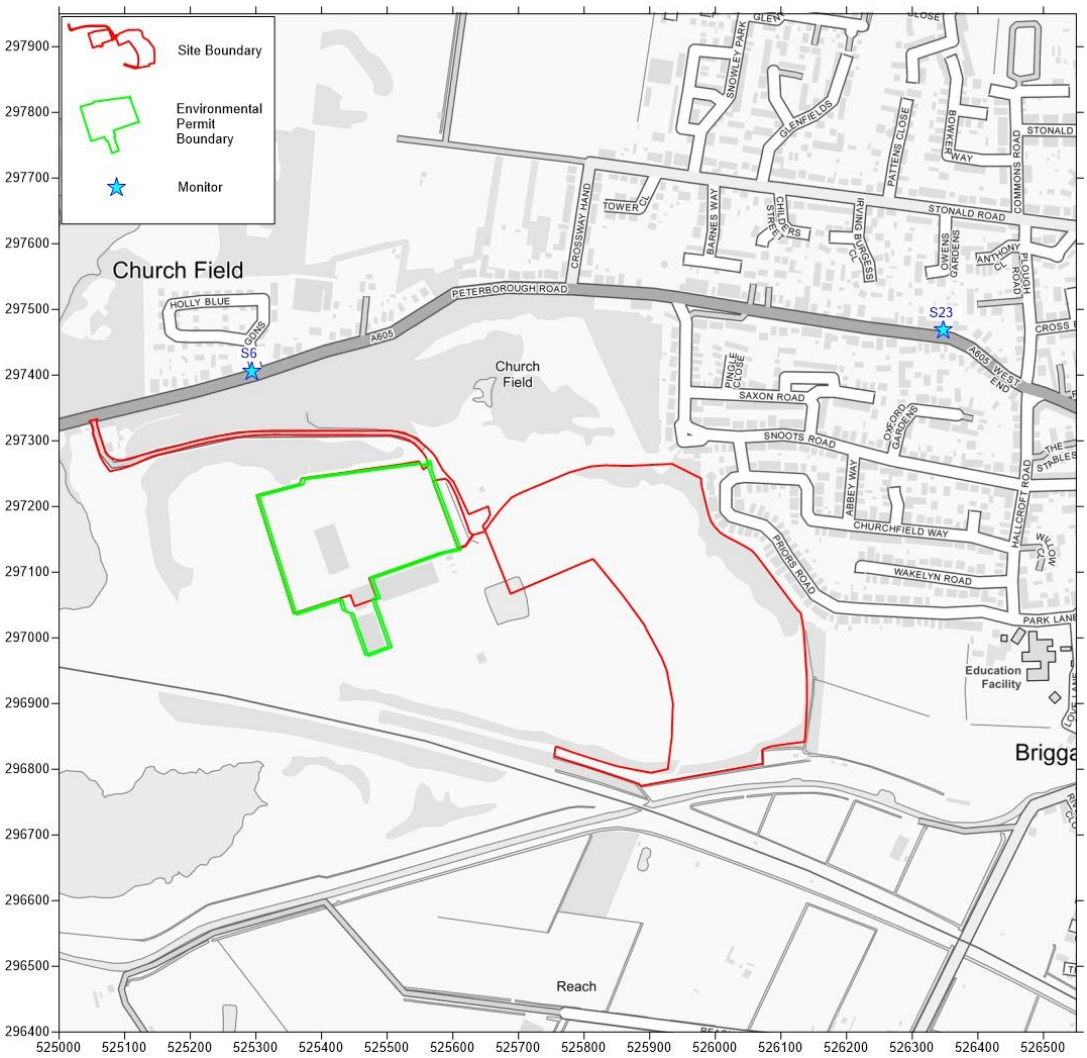
Monitoring Site		Monitored NO_2 Concentration (µg/m³)		
		2020	2021	2022
S6	Kings Dyke	15.1	15.4	12.8
S23	West End, Whittlesey	16.3	17.4	17.1

4.3.2 As shown in **Table 16**, annual mean NO_2 concentrations were below the AQO at both monitoring locations between 2020 and 2022.

4.3.3 Pollutant concentrations during 2020 and 2021 were affected by changes to travel patterns associated with the COVID-19 pandemic. The results should therefore be viewed with caution. However, data for 2022 is now considered representative of post-pandemic conditions. This is supported by the IAQM[14], who have adopted the following position:

"ambient air quality monitoring data for the year 2022 and beyond is generally considered to represent the current post-pandemic baseline"

4.3.4 **Figure 2** details the monitoring locations.



4.3.5 FDC does not undertake PM_{10} or $PM_{2.5}$ monitoring within the vicinity of the site.

[14] Use of 2020 and 2021 Monitoring Datasets - IAQM Position Statement V1.1, IAQM, 2023.

4.4 Background Pollutant Concentrations

4.4.1 Predictions of background pollutant concentrations on a 1km by 1km basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The site is located in grid square NGR: 525500, 297500. Data for this location was downloaded from the DEFRA website[15] and is summarised in **Table 17**.

Table 17: Background Pollutant Concentrations

Pollutant	Predicted Background Pollutant Concentration (µg/m^3)	
	2022	2024
NO_2	8.98	8.43
PM_{10}	16.67	16.29
$PM_{2.5}$	9.42	9.15

4.4.2 As shown in **Table 17**, predicted background NO_2, PM_{10} and $PM_{2.5}$ concentrations are below the relevant AQOs and Interim Target at the site.

4.5 Site Characteristics

4.5.1 The characteristics of the site and surrounding land uses are summarised in **Table 18**. Operations and activities undertaken based on the extant Environmental Permit are shown in **bold**. Those relevant to the Environmental Permit Variation application are shown in *italics*. Reference should be made to **Figure 3** (below) for a proposed site layout plan.

Table 18: Site Characteristics

Characteristics	Details
Site Extent	The site lies within the existing Saxon Works industrial site, to the west of Whittlesey The total site area is approximately 17.2ha with a substantial amount of this land reserved for Biodiversity Net Gain purposes The total area within the Environmental Permit boundary shown in green on Figure 2 (above) is approximately 4.8ha The site is bound by undeveloped land to the north, with Kings Dyke located to the north-west and south-west. The Whittlesea Rail Line borders the south of the site and residential properties are located along the eastern boundary
Existing site operations	**The site recycles IBA and C&D waste material to produce Incinerator Bottom Ash Aggregate (IBAA). The extant permission allows up to 250,000tpa of IBA and 50,000tpa of C&D waste to be managed on site**

[15] https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

Table 18: Site Characteristics	
Type and location of processing activities	**IBA material is loaded onto a conveyor belt, via a hopper, through a trommel/screener and taken inside the proposed main recycling (Building 1). The material is then sorted into fractions for ongoing processing to produce varying sizes of IBAA** **Upon arrival to site C&D waste is deposited, processed and stored in designated storage bays in the north-west corner of the site. Crushing and screening externally is completed on a campaign basis and only between the hours of 08:00 and 18:00 Mondays to Fridays** *It is proposed to include crushing of IBA and IBAA on a campaign basis. This will utilise similar mobile plant as C&D recycling*
Material type and characteristics	**IBA and C&D waste is recycled at the facility**
Production rate	**The extant permission allows for a material processing rate of 300,000tpa.** *It is proposed to increase to 614,000tpa* **Crushing and screening is undertaken between the hours of 08:00 to 18:00 Mondays to Fridays including bank holidays (except Christmas day).** *The working hours in Building 1 are proposed to be increased to allow processing of IBA 24-hours a day, 7-days a week, including Sundays and Bank Holidays (except Christmas Day)*
Methods of material handling	**Material arrives on site in HGVs and is transferred throughout the process using a combination of loading shovels and enclosed conveyors.** **Processed material is taken from the building via conveyors or loading shovel directly to storage bays, or HGVs ready for export**
Location of storage areas and stockpiling	**Upon arrival to site IBA is stored in a dedicated holding area in the north-eastern section of the site. It will remain here for a minimum period of 6-weeks until the material is determined to be a suitable state in which it can be screened and processed** **Upon arrival to site C&D waste is deposited, processed and stored in designated storage bays in the north-west corner of the site** **The extant permission allows for storage of materials within the confines of the approved Waste Materials Reception area, and the maximum stockpile height of 4.6m when measured from the base is applicable** *Due to the proposed increase in throughput of IBA and C&D waste, it is proposed to increase the height of the stockpile of waste material to 6.7m when measured from the base. This will include an increase in the Lego block wall to approximately 7.2m to reduce the potential for fugitive emission release*
Location and number of access routes and haul roads	**Access is off Peterborough Road, to the north of site, which is surfaced with concrete hardstanding** **The extant permission allows for a maximum of 92 HGV movements per day.** *It is proposed to increase to 332 HGV movements per day*

Table 18: Site Characteristics	
Mitigation measures	**The facility operates under the requirements of a Dust Management Plan to formalise the relevant mitigation measures** **The facility operates under the requirements of an Environmental Permit. This includes a requirement for control of emissions beyond the site boundary.** *The Environmental Permit will be varied to ensure the proposed operations are included as necessary* **Processing of IBA is only undertaken whilst the material still contains at least 10% of the moisture added to it during transportation to the site. This reduces the potential for dust emissions** **The majority of processing operations is undertaken within an enclosed building** **All entrance doors remain closed wherever practical** **All conveyor belts processing material externally are enclosed** **All areas have a hard surface capable of being cleaned** **Unprocessed IBA storage is limited to 12 weeks** **Material is not be stockpiled externally for long periods of time and is limited to those detailed within the Environmental Permit** *An ancillary lean-to building, which will act as an extension to the existing waste processing Building 1, will be constructed. The main purpose of the building is to minimise dust emissions arising from use of the trommel*

4.6 Meteorology

4.6.1 Unlike many other atmospheric pollutants, the generation and dispersion of odour and dust is particularly dependent upon weather conditions. The prevailing meteorological conditions

at any site will be dependent upon many factors including its location in relation to macroclimatic conditions as well as more site specific, microclimate conditions.

4.6.2 In order to consider prevailing conditions at the site, review of meteorological data was undertaken. Records were obtained from RAF Wittering Meteorological Station. This is located at NGR: 568732, 222996, which is approximately 21.7km north-west of the scheme. It is considered that conditions are likely to be reasonably similar over a distance of this magnitude and the information is a suitable source of data for an assessment of this nature.

4.6.3 Meteorological data over the period 1st January 2018 to 31st December 2022 (inclusive) was reviewed. The frequency of wind from the 12 sectors which best describe the directions which may cause impacts in the vicinity of the site is shown in **Table 19**.

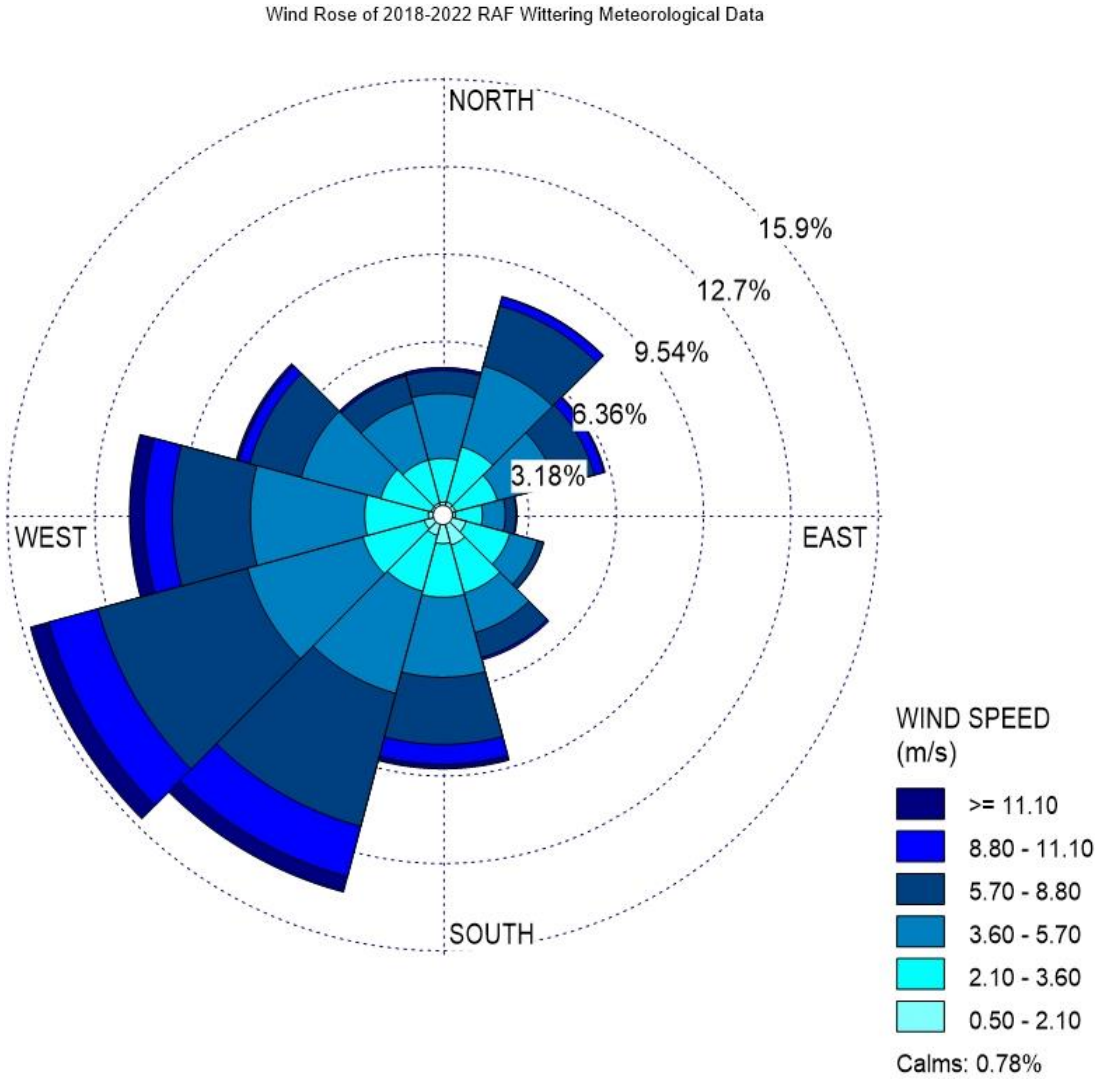
Table 19: Wind Frequency Data

Wind Direction (°)	Total Frequency of Wind (%)	Total Frequency of Potentially Dusty Winds (%)
345 - 15	4.7	1.1
15 - 45	7.3	3.3
45 - 75	4.9	2.3
75 - 105	2.7	0.5
105 - 135	4.3	0.4
135 - 165	6.3	1.2
165 - 195	11.3	3.9
195 - 225	15.3	8.3
225 - 255	15.3	9.4
255 - 285	12.1	4.9
285 - 315	8.7	2.9
315 - 345	5.4	1.5
Sub-Total	98.3	39.7
Calms	0.6	56.3
Missing/Incomplete	1.1	4.1

4.6.4 All meteorological data used in the assessment was provided by Atmospheric Dispersion Modelling Ltd, which is an established distributor of meteorological data within the UK.

4.6.5 As shown in **Table 19**, the prevailing wind direction at the site is from the south-west. Winds from the north through east to the south are relatively infrequent, which is indicative of conditions throughout the UK.

4.6.6 **Figure 4** shows the proportional wind rose of the meteorological data.



4.7 Sensitive Receptors

4.7.1 A sensitive receptor is defined as any location which may be affected by changes in air quality. These have been defined in the following Sections.

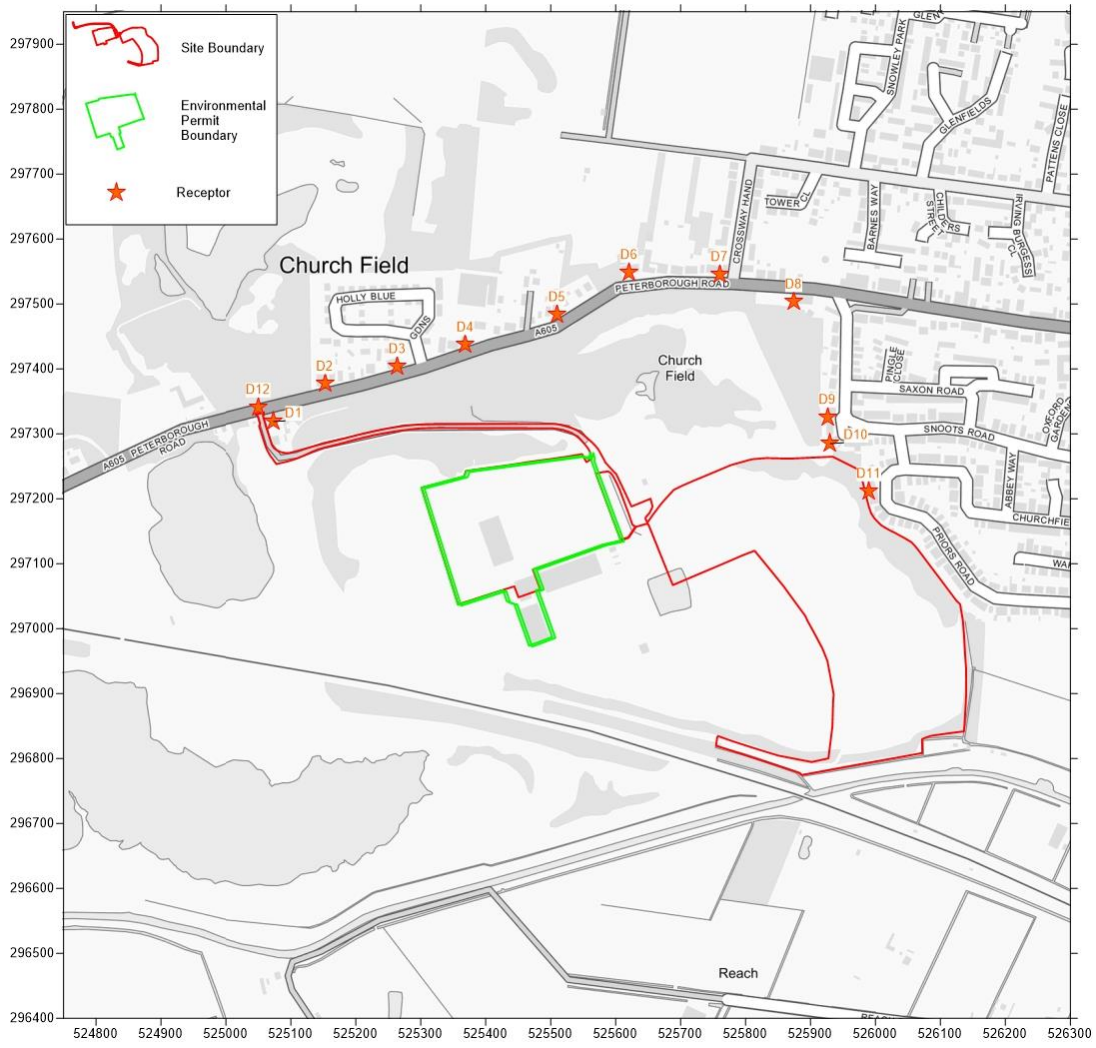
Dust Emission Sensitive Receptors

Dust Disamenity Sensitive Receptors

4.7.2 Positions sensitive to potential dust disamenity impacts were identified from a desk-top study of the area up to 400m from the site boundary. These are shown in **Table 20.**

Table 20: Dust - Disamenity Sensitive Receptors						
Receptor	NGR (m)		Distance from Site (m)	Direction from Site	Proportion of Time Receptor Downwind of Site (%)	Sensitivity
	X	Y				
D1	525073.2	297319.0	245	North	1.53	High
D2	525152.4	297377.2	205	North	1.53	High
D3	525264.2	297404.2	180	North	5.38	Medium
D4	525368.7	297437.5	200	North	5.38	High
D5	525510.2	297484.0	225	North	12.15	High
D6	525621.1	297549.0	285	North	21.53	High
D7	525760.3	297546.1	345	North-east	17.67	High
D8	525874.3	297503.6	400	North-east	17.67	Medium
D9	525926.1	297325.9	370	East	14.31	High
D10	525930.3	297284.9	355	East	14.31	High
D11	525990.0	297212.0	395	East	4.93	High
D12	525049.8	297341.2	15	North	5.89	Low

4.7.3 As shown in **Table 20**, there are several sensitive receptors of **high** sensitivity in the vicinity of the facility, with the majority being located to the north and east of the site. Receptor D12 is the King's Dyke CWS, an ecological designation. Reference should be made to **Figure 6** for a graphical representation of fugitive dust emission receptors.



Human Health Sensitive Receptors

4.7.4 The IAQM guidance[16] states that if the long term background PM_{10} concentration is less than 17µg/m^3 there is little risk that fugitive dust emissions would lead to exceedences of the AQOs at locations of relevant exposure. As shown in **Table 17**, the predicted background PM_{10} concentration in the vicinity of the site is 16.29µg/m^3 during 2024. This is below the relevant value. As such, the potential for PM_{10} emissions from the site to affect concentrations at human health receptors is predicted to be **not significant**, in accordance with the IAQM guidance[17]. Individual receptor locations have therefore not been considered further.

16 Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.
17 Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.

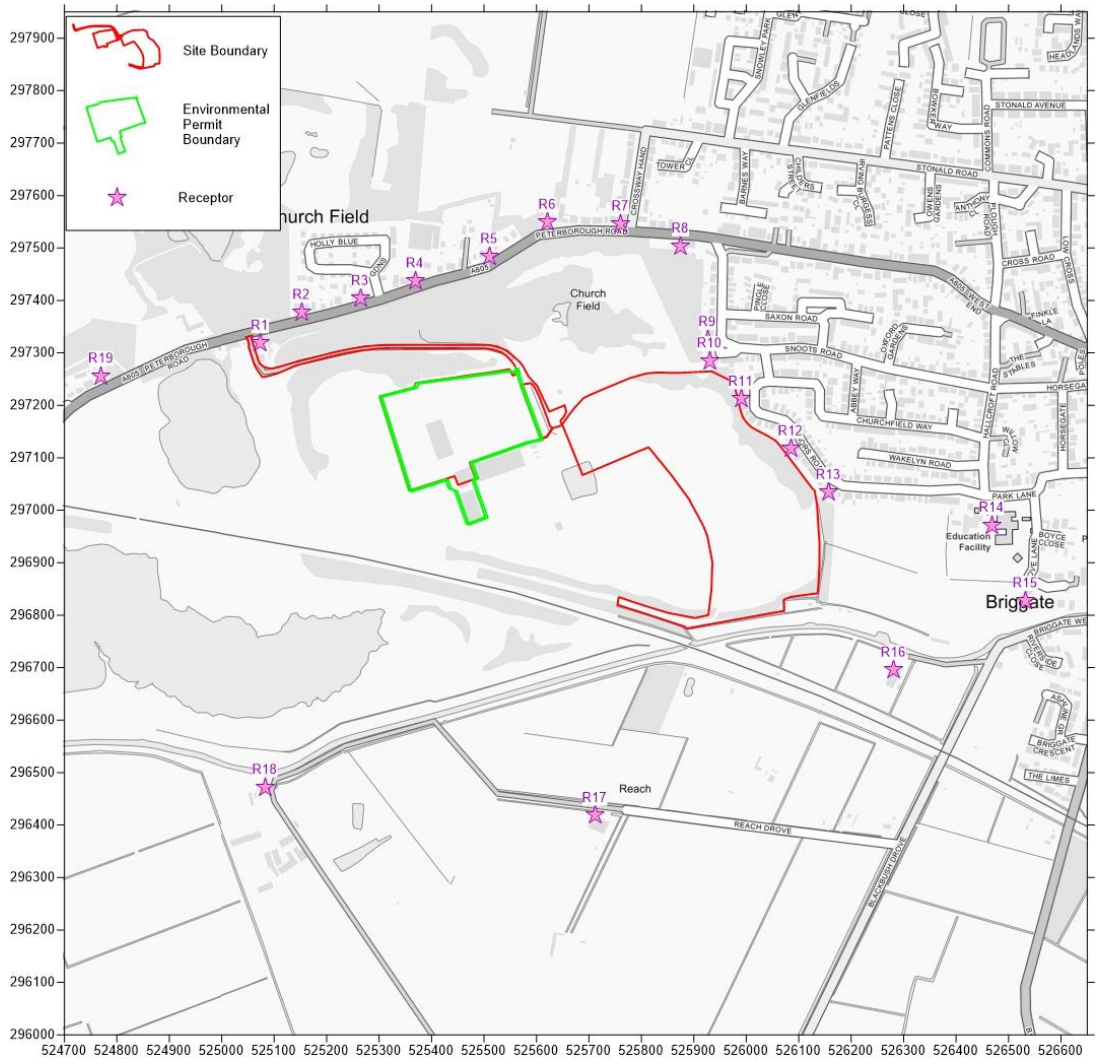
Odour Emission Sensitive Receptors

4.7.5 Locations sensitive to odour emissions as a result of operational activities associated with the scheme were identified from a desk-top study and are summarised in **Table 21.**

Table 21: Odour Emission Sensitive Receptors

Receptor	NGR (m)		Sensitivity	Distance from Boundary (m)
	X	Y		
R1	525073.2	297319.0	High	245
R2	525152.4	297377.2	High	205
R3	525264.2	297404.2	Medium	180
R4	525368.7	297437.5	High	200
R5	525510.2	297484.0	High	225
R6	525621.1	297549.0	High	285
R7	525760.3	297546.1	High	345
R8	525874.3	297503.6	Medium	400
R9	525926.1	297325.9	High	370
R10	525930.3	297284.9	High	355
R11	525990.0	297212.0	High	395
R12	526084.9	297117.7	High	485
R13	526156.9	297034.6	High	565
R14	526467.8	296971.8	High	880
R15	526532.2	296827.7	High	980
R16	526281.0	296695.5	Low	810
R17	525711.3	296418.3	Low	605
R18	525082.3	296472.0	High	625
R19	524770.3	297256.2	High	525

4.7.6 **Figure 7** details the odour emission receptor locations.


Site Boundary
Environmental Permit Boundary
Receptor
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
Church Field
Reach
Brigate
Education Facility
PETERBOROUGH ROAD
A605
297900
297800
297700
297600
297500
297400
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524700 524800 524900 525000 525100 525200 525300 525400 525500 525600 525700 525800 525900 526000 526100 526200 526300 526400 526500 526600

5 ASSESSMENT

5.1 Introduction

5.1.1 There is the potential for air quality impacts as a result of the proposed Environmental Permit Variation. These are assessed in the following Sections.

5.2 Dust Emissions Assessment

Screening

Dust Disamenity Sensitive Receptors

5.2.1 The desk-study to inform the baseline identified a number of disamenity dust sensitive receptors within 400m of relevant activities. As such, a detailed assessment of potential dust disamenity impacts was required.

Human Health Sensitive Receptors

5.2.2 As outlined previously, the IAQM guidance[18] states that if the long term background PM_{10} concentrations is less than 17µg/m^3 there is little risk that emissions would lead to an exceedence of the AQOs. As shown in **Table 17**, the predicted background PM_{10} concentration in the vicinity of the site is 16.29µg/m^3 during 2024. This is below the relevant value. As such, potential increases in PM_{10} concentrations at human health receptors as result of operational phase fugitive dust emissions are predicted to be **not significant**.

Disamenity Dust Assessment

5.2.3 The dust impact risk was determined for each of the main operational activities discussed in Section 3.0 using the steps outlined below.

Estimation of Residual Source Emissions

5.2.4 Residual source emissions from the main operational activities were classified based on the criteria provided in **Table 2**. The results are summarised in **Table 22.**

[18] Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.

Table 22: Dust - Residual Source Emissions Classification		
Activity	**Residual Source Emission**	**Justification**
Materials handling	Medium	6 loading vehicles on site at any one time The majority of waste handling will take place within a building or via enclosed conveyors
Material processing	Small	The majority of processing activities will take place within a building or via enclosed conveyors Facility capacity 614,000tpa
Stockpiles and exposed surfaces	Small	Stockpile area less than 2.5ha Stockpiled material will be limited to those detailed within the Environmental Permit Stockpiles will be reduced between November and December
Off-site transportation	Medium	More than 200 HGV movements per day Hard surfaced access road and site area

5.2.5 As shown in **Table 22**, the magnitude of residual source emissions from dust generating activities was classified as **small** to **medium**.

Estimation of Pathway Effectiveness

5.2.6 The pathway effectiveness at each sensitive receptor identified during the desk-top study was identified based on criteria provided in **Table 3**, **Table 4** and **Table 5**. These are summarised in **Table 23.**

Table 23: Dust - Sensitive Receptor Pathway Effectiveness					
Receptor	**Frequency of Potentially Dusty Winds**		**Distance from Source**		**Pathway Effectiveness**
	Proportion of Time Downwind of Source (%)	**Category**	**Distance from source (m)**	**Category**	
D1	1.53	Infrequent	245	Distant	Ineffective
D2	1.53	Infrequent	205	Distant	Ineffective
D3	5.38	Moderately frequent	180	Intermediate	Moderately effective
D4	5.38	Moderately frequent	200	Distant	Ineffective
D5	12.15	Frequent	225	Distant	Moderately effective
D6	21.53	Very frequent	285	Distant	Moderately effective
D7	17.67	Frequent	345	Distant	Moderately effective
D8	17.67	Frequent	400	Distant	Moderately effective

Table 23: Dust - Sensitive Receptor Pathway Effectiveness					
Receptor	Frequency of Potentially Dusty Winds		Distance from Source		Pathway Effectiveness
	Proportion of Time Downwind of Source (%)	Category	Distance from source (m)	Category	
D9	14.31	Frequent	370	Distant	Moderately effective
D10	14.31	Frequent	355	Distant	Moderately effective
D11	4.93	Infrequent	395	Distant	Ineffective
D12	5.89	Moderately frequent	15	Close	Moderately effective

5.2.7 As shown in **Table 23**, the pathway effectiveness was determined to be **moderately effective** at eight locations and **ineffective** at four receptors.

Estimation of Dust Impact Risk

5.2.8 In accordance with Section 5 of the IAQM guidance[19] the residual source emissions, shown in **Table 22** and the pathway effectiveness shown in **Table 23** were combined to predict the dust impact risk using the criteria provided in **Table 6**. This is summarised in **Table 24**. It should be noted that the maximum residual source emission classification of **medium** was utilised to ensure a worst-case assessment.

Table 24: Dust - Disamenity Dust Impact Risk			
Receptor	Maximum Residual Source Emission	Pathway Effectiveness	Dust Impact Risk
D1	Medium	Ineffective	Negligible
D2	Medium	Ineffective	Negligible
D3	Medium	Moderately effective	Low
D4	Medium	Ineffective	Negligible
D5	Medium	Moderately effective	Low
D6	Medium	Moderately effective	Low
D7	Medium	Moderately effective	Low
D8	Medium	Moderately effective	Low
D9	Medium	Moderately effective	Low

[19] Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.

Table 24: Dust - Disamenity Dust Impact Risk			
Receptor	**Maximum Residual Source Emission**	**Pathway Effectiveness**	**Dust Impact Risk**
D10	Medium	Moderately effective	Low
D11	Medium	Ineffective	Negligible
D12	Medium	Moderately effective	Low

5.2.9 As shown in **Table 24**, the dust impact risk was determined as **low** at eight locations and **negligible** at four receptors.

Estimation of Dust Magnitude of Effect

5.2.10 In accordance with Section 5 of the IAQM guidance[20], the dust impact risk was considered with the sensitivity of the receptor to predict the magnitude of effect. This is summarised in **Table 25**.

Table 25: Dust - Prediction of Disamenity Effects at Sensitive Receptors			
Receptor	**Dust Impact Risk**	**Receptor Sensitivity**	**Magnitude of Dust Effect**
D1	Negligible	High	Negligible
D2	Negligible	High	Negligible
D3	Low	Medium	Negligible
D4	Negligible	High	Negligible
D5	Low	High	Slight
D6	Low	High	Slight
D7	Low	High	Slight
D8	Low	Medium	Negligible
D9	Low	High	Slight
D10	Low	High	Slight
D11	Negligible	High	Negligible
D12	Low	Low	Negligible

[20] Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.

5.2.11 As shown in **Table 25**¸ the magnitude of dust effects was predicted to be **slight** at five receptors and **negligible** at the remaining seven locations.

5.2.12 The IAQM guidance[21] states that **negligible** or **slight** impacts are not considered **significant**. As such, overall effects are considered to be **not significant**.

Overall Significance of Dust Emission Effects

5.2.13 The IAQM guidance[22] states that the assessment must reach a conclusion on the overall significance of predicted fugitive dust effects associated with the site. Given that impacts on PM_{10} concentrations at human health receptors were predicted to be **not significant** and disamenity dust effects were also predicted to be **not significant**, the significance of potential fugitive dust emission effects was concluded to be **not significant**, in accordance with the stated methodology.

Mitigation

5.2.14 The assessment has shown that predicted impacts associated with fugitive dust emissions during operation are **not significant**. As such, mitigation to further reduce potential effects is not considered necessary. However, the following measures will be incorporated into the facility:

- Operation in accordance with the relevant requirements of the Environmental Permit, regulated by the EA; and,
- Production and implementation of a Dust Management Plan to formalise control measures throughout operation.

5.2.15 Implementation of the above methods should further minimise fugitive dust emission impacts throughout the operational phase.

5.3 Odour Emissions Assessment

Inherent Mitigation

5.3.1 In order to control potential odour emissions to acceptable levels a number of mitigation measures are proposed for the facility. These are outlined within the Odour Management Plan[23] (OMP) and Planning and Environment Statement[24] produced in support of the extant scheme and can be summarised as follows:

21 Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.
22 Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.
23 OMP, Johnsons Aggregates and Recycling, 2020.
24 Whittlesey IBA and Construction & Demolition Material Recycling Facility, Planning and Environment Statement, Johnsons Aggregates and Recycling, 2021.

- Inspection of all IBA loads to ensure that the material does not include an inacceptable level of biodegradable material that has survived the incineration process;
- All doors on the main recycling building to be closed whenever practicable;
- Processing of IBA to take place only within the main recycling building with air extraction and filter systems;
- All IBA will be subject to strict quality assessments;
- Storage of IBA will be limited to a maximum of 12-weeks;
- Appropriate staff levels and training will be provided, especially over the very busy post-Christmas/New Year period to ensure that all material is managed effectively;
- Critical spare parts will be stored on site and appropriate technical staff will be available to ensure any plant/machinery issues are rectified as soon as possible;
- Alternative sites operated by the Applicant are available to handle material should any serious issues arise on the site; and,
- Use of an on-site MCERTS accredited weather monitoring station.

5.3.2 The above measures will remain in place to mitigate potential odours following the proposed variations to site operations.

Assessment

5.3.3 The odour risk associated with emissions from the site was assessed at the identified receptor locations in accordance with the IAQM methodology[25]. The first step was to classify the Source Odour Potential.

5.3.4 The Source Odour Potential was classified as **medium** due to the following considerations:

- The facility is considered to be a smaller Environmentally Permitted process;
- IBA and IBAA is likely to result in earthy odours which are considered 'less offensive' or 'moderately offensive', in accordance with EA Guidance H4[26];
- IBA will be stockpiled in order to establish the material through weathering and maturation. This will allow a crust to form on the pile, restricting emissions;
- Operational processes will be contained within the main building and enclosed conveyor belts; and,

25 Guidance on the Assessment of Odour for Planning, IAQM, 2018.
26 H4: Odour Management, EA, 2011.

- All entrance doors to the main building will remain closed wherever practical.

5.3.5 The pathway effectiveness was subsequently defined for the identified receptors based on the distance from the facility boundary and the prevailing wind direction in relation to the site. This is summarised in **Table 26**.

Table 26: Odour - Pathway Effectiveness

Receptor	Pathway Effectiveness	Justification
R1	Ineffective	The receptor is located 245m to the north of the proposed site and associated sources There is a low frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R2	Ineffective	The receptor is located 205m to the north of the proposed site and associated sources There is a low frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R3	Moderate	The receptor is located 180m to the north of the proposed site and associated sources There is a moderate frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R4	Ineffective	The receptor is located 200m to the north of the proposed site and associated sources There is a moderate frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R5	Ineffective	The receptor is located 225m to the north of the proposed site and associated sources There is a moderate frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R6	Ineffective	The receptor is located 285m to the north of the proposed site and associated sources There is a high frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R7	Ineffective	The receptor is located 345m to the north-east of the proposed site and associated sources There is a high frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R8	Ineffective	The receptor is located 400m to the north-east of the proposed site and associated sources

Table 26: Odour - Pathway Effectiveness		
Receptor	**Pathway Effectiveness**	**Justification**
		There is a high frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R9	Ineffective	The receptor is located 370m to the east of the proposed site and associated sources There is a high frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R10	Ineffective	The receptor is located 355m to the east of the proposed site and associated sources There is a high frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R11	Ineffective	The receptor is located 395m to the east of the proposed site and associated sources There is a moderate frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R12	Ineffective	The receptor is located 485m to the east of the proposed site and associated sources There is a moderate frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R13	Ineffective	The receptor is located 565m to the south-east of the proposed site and associated sources There is a moderate frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R14	Ineffective	The receptor is located 880m to the south-east of the proposed site and associated sources There is a moderate frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R15	Ineffective	The receptor is located 980m to the south-east of the proposed site and associated sources There is a moderate frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R16	Ineffective	The receptor is located 810m to the south-east of the proposed site and associated sources There is a low frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release

Table 26: Odour - Pathway Effectiveness		
Receptor	**Pathway Effectiveness**	**Justification**
R17	Ineffective	The receptor is located 605m to the south of the proposed site and associated sources There is a low frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R18	Ineffective	The receptor is located 625m to the south-west of the proposed site and associated sources There is a low frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release
R19	Ineffective	The receptor is located 525m to the north-west of the proposed site and associated sources There is a low frequency of winds from source to receptor The proposed mitigation measures, as outlined previously, will reduce the potential for odour release

5.3.6 In accordance with Section 3 of the IAQM guidance[27], the information in **Table 26** was used with the land use sensitivity identified in **Table 13** to assess the odour risk and effect significance at each location. This is summarised in **Table 27**.

Table 27: Odour - Risk Assessment					
Receptor	**Source Odour Potential**	**Pathway Effectiveness**	**Exposure Risk**	**Sensitivity**	**Effect Significance**
R1	Medium	Ineffective	Negligible	High	Negligible
R2	Medium	Ineffective	Negligible	High	Negligible
R3	Medium	Moderate	Low	Medium	Negligible
R4	Medium	Ineffective	Negligible	High	Negligible
R5	Medium	Ineffective	Negligible	High	Negligible
R6	Medium	Ineffective	Negligible	High	Negligible
R7	Medium	Ineffective	Negligible	High	Negligible
R8	Medium	Ineffective	Negligible	Medium	Negligible
R9	Medium	Ineffective	Negligible	High	Negligible
R10	Medium	Ineffective	Negligible	High	Negligible

[27] Guidance on the Assessment of Odour for Planning, IAQM, 2018.

Table 27: Odour - Risk Assessment					
Receptor	**Source Odour Potential**	**Pathway Effectiveness**	**Exposure Risk**	**Sensitivity**	**Effect Significance**
R11	Medium	Ineffective	Negligible	High	Negligible
R12	Medium	Ineffective	Negligible	High	Negligible
R13	Medium	Ineffective	Negligible	High	Negligible
R14	Medium	Ineffective	Negligible	High	Negligible
R15	Medium	Ineffective	Negligible	High	Negligible
R16	Medium	Ineffective	Negligible	Low	Negligible
R17	Medium	Ineffective	Negligible	Low	Negligible
R18	Medium	Ineffective	Negligible	High	Negligible
R19	Medium	Ineffective	Negligible	High	Negligible

5.3.7 As shown in **Table 27**, the predicted odour effect significance was **negligible** at all receptor locations.

5.3.8 The IAQM guidance states that only if the impact is greater than **slight**, the effect is considered **significant**. As such, operational phase odour emission impacts are considered **not significant**, in accordance with the stated methodology.

Mitigation

5.3.9 The assessment has shown that predicted impacts associated with odour emissions during operation are **not significant**. As such, mitigation to further reduce potential effects is not considered necessary. However, the following measures will be incorporated into the facility:

- Operation in accordance with the relevant requirements of the Environmental Permit, regulated by the EA; and,
- Production and implementation of an Odour Management Plan to formalise control measures throughout operation.

5.3.10 Implementation of the above methods should further minimise odour impacts throughout the operational phase.

6 CONCLUSIONS

6.1.1 NoiseAir Limited has carried out an AQA in support of the Environmental Permit Variation Application for the proposed changes to the existing IBA and C&D waste management facility at Saxon Brickworks, Whittlesey, and the findings predict the facility will not have a significant impact on receptors.

6.1.2 The facility may have the potential to result in adverse air quality effects at sensitive locations. As such, an AQA was undertaken in order to determine baseline conditions at the site and assess potential impacts.

6.1.3 Potential impacts may occur due to fugitive dust emissions associated with the processing of IBA, IBAA and C&D waste. These were assessed using the relevant IAQM guidance[28]. This indicated the overall impact of PM_{10} emissions on concentrations at human health receptors was predicted to be **not significant**. Potential dust disamenity impacts were assessed in accordance with a source-pathway-receptor methodology and considered receptor location and sensitivity, dust source potential and prevailing meteorological conditions. The disamenity dust impact was predicted to be **slight** at five receptors and **negligible** at the remaining seven locations. As such, the overall disamenity effect was classified as **not significant**. Following consideration of the relevant issues, the overall significance of fugitive dust effects as a result of the operation of the facility were predicted to be **not significant**, in accordance with the stated methodology.

6.1.4 Potential impacts may occur due to fugitive odour emissions associated with the processing of IBA and IBAA. These were assessed using the relevant IAQM methodology[29]. This included consideration of the Source Odour Potential, pathway effectiveness and receptor sensitivity. The results of the assessment indicated the predicted odour effect significance was **negligible** at all receptors. Following review of the relevant factors, overall odour effects associated with the operation of the facility were predicted to be **not significant**, in accordance with the stated methodology.

[28] Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.
[29] Guidance on the Assessment of Odour for Planning, IAQM, 2018.

APPENDIX A - REPORT LIMITATIONS

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APPENDIX B - GLOSSARY

Air Quality Limit Value	Legally binding parameters defined in European Union air quality legislation that must not be exceeded. Limit values are set for individual pollutants and are a combination of a concentration value, an averaging time over which it is measured, the number of exceedences allowed per year, and a date by which it must be achieved.
Air Quality Management Area	An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives.
Air Quality Objective	The name given to the maximum ambient pollutant concentration that is not to be exceeded either without exception or within a permitted number of exceedences over a specified timescale for a pollutant outlined in the national Air Quality Strategy.
Air Quality Strategy	A national government document which contains standards, objectives and measures for improving ambient air quality.
Background Concentration	The pollutant concentration assumed to represent baseline concentrations in the atmosphere across the modelled area.
Heavy Goods Vehicle	Vehicles with a gross weight of greater than 3.5 tonnes.

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