

On behalf of
Reading Borough Council

November 2021

Project Number
1620009874

GYPSY AND TRAVELLER SITE, READING AIR QUALITY ASSESSMENT

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Project No. 1620012682
Issue No. 03
Date 30/11/2021
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Version Control Log

Revision	Date	Made by	Checked by	Approved by	Description
1	26/10/2021	CH	GH	GH	First draft for client review
2	26/11/2021	CH	GH	GH	Updated development description
3	30/11/2021	CH	GH	GH	Update with client comments

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1. INTRODUCTION

1.1 Overview

Ramboll UK Limited (Ramboll) was commissioned by Reading Borough Council, (hereafter referred to as 'the Applicant') to carry out an air quality assessment in respect of the development of land south of Island Road, Reading ('Application Site'). This assessment is required to accompany a planning application for the development of the Application Site.

The site is located within the administrative boundary of Reading Borough Council (RBC).

1.2 Assessment Scope and Objectives

The Application Proposal is for a gypsy and traveller transit site. A transit site is:

*"A site intended for short-term use while in transit. The site is usually permanent and authorised, but there is a limit on the length of time residents can stay."*¹

It will comprise seven pitches, a site office, bin store, outdoor seating area, play area, and a new access onto Island Road. Each pitch comprises a kitchen/toilet block and space for two caravans and two cars.

This report describes existing local air quality at the development site and in the local area and considers the construction and operational impacts of the development.

Traffic flows generated by the proposed development during the construction phase are likely to be below the indicative criteria set out in the Institute of Air Quality Management / Environmental Protection UK (IAQM/EPUK) guidance² which suggest an air quality assessment is not required. The construction vehicle movement impacts on human health receptors in the area are temporary and not significant and have therefore been scoped out of this assessment.

As construction will be minimal, a construction dust assessment has not been prepared, however standard dust mitigation measures are provided which can be incorporated into a Construction Environmental Management Plan (CEMP) for the development. With the implementation of the CEMP, the effect of dust impacts will not be significant.

The proposed development has parking provision for 14 vehicles and an assessment has been made of the potential impact of development traffic by comparing the trip generation with recognised thresholds for an assessment to be necessary.

An odour assessment has also been undertaken for the nearby Wastewater Treatment Plant (WWTP) and recycling centre which are located to the south and west of the proposed development site respectively.

¹ ARC⁴ for Reading Borough Council, Reading Gypsy and Traveller, 2017. "Travelling, Showperson and Houseboat Dweller Accommodation Assessment" 2017

² Institute of Air Quality Management and Environmental Protection UK, 2017. Land-Use Planning & Development Control: Planning for Air Quality. Available: <https://iaqm.co.uk/guidance/>

2. SITE DESCRIPTION

2.1 Site Location

The site is located on land to the south of Island Road, Reading, RG2 0RP, to the east of the waste recycling centre and north of the WWTP. (Grid Reference: E 470690 N 170790).

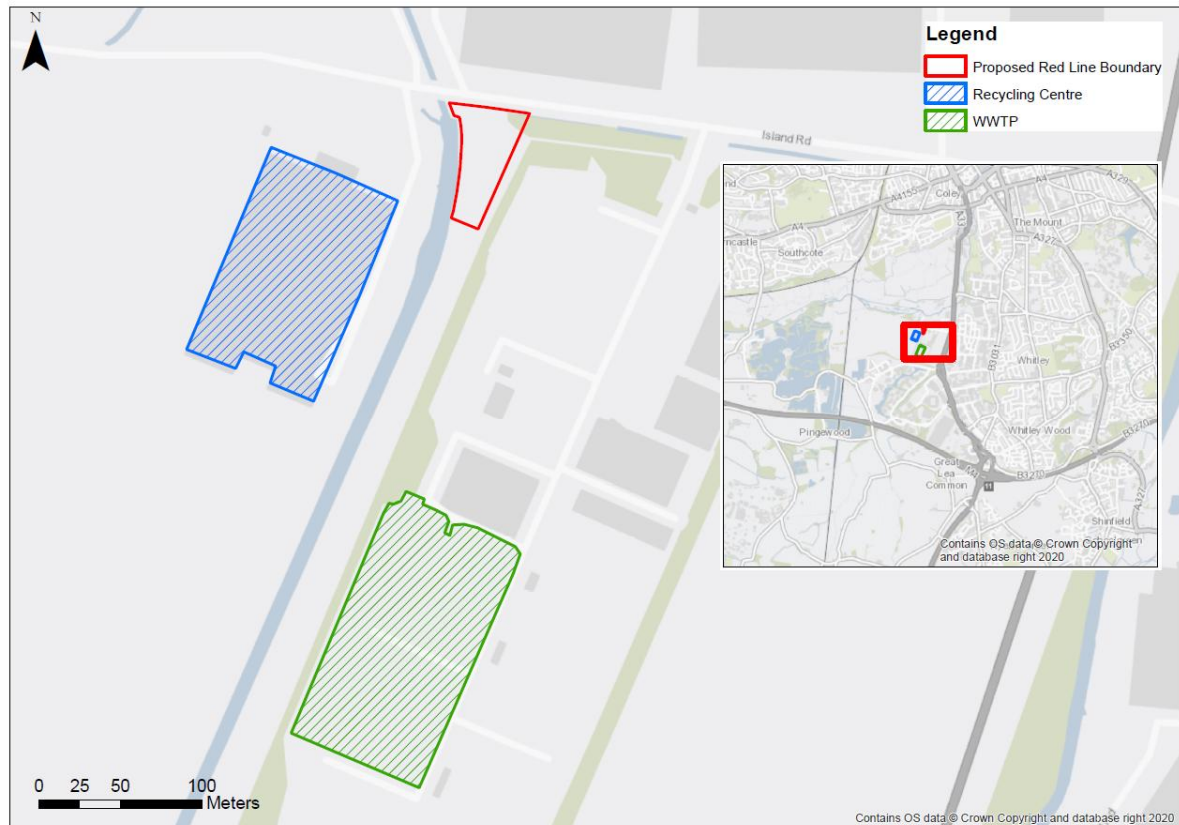


Figure 2.1: Site Location

2.2 Development Description

The construction the Gypsy and Traveller transit site comprises of seven pitches, bin store, outdoor seating area, play area, and a new access onto Island Road. Each pitch comprises a kitchen/toilet block and space for two caravans and two cars. This includes seven pitches with car parking for up to 14 vehicles, an office and sanitary block building, and an enclosed area for commercial waste. The proposed development does not include any substantial combustion processes.

At its closest point, the red line boundary is approximately 4m south of Island Road and 370m west of the A33.

2.3 Site Characteristics and Designations

The Application Site is overgrown scrubland. It is enclosed by mature, dense tree belts to the east and west which will be retained. To the north is Island Road which leads to the A33; to the east is car parking serving the Reading wastewater treatment plant (WWTP); to the south the scrubland narrows and continues; to the west is a watercourse beyond which the Reading Waste Management Park located within a large warehouse building.

The Application Site is approximately 140m south of the Reading WWTP and approximately 40m east of the recycling centre. Odour from these sources has the potential to adversely impact on amenity within the Application Site.

RBC have one large Air Quality Management Area (AQMA) covering all the major arterial roads into and out of the town as well as the central area. The Application Site is approximately 280m west of the AQMA.

The main sources of air pollution in the borough are road traffic emissions and the primary ambient air quality concern regarding the Application Site is its proximity to the A33, which is included within the Reading AQMA.

3. LEGISLATION AND POLICY

3.1 National Legislation and Policy

3.1.1 European Union Ambient Air Quality and Clean Air for Europe, 2008

EU Directive 2008/50/EC³ on ambient air quality and cleaner air for Europe (the CAFE directive) sets out the ambient air quality standards for NO₂ and particulate matter with an aerodynamic diameter of less than 10 µm (PM₁₀) to be achieved by 1 January 2010 and 2005 respectively. The Air Quality Standards Regulations 2010⁴ implements the requirements of the Directive into United Kingdom (UK) legislation.

The Directive contains a series of limit values for the protection of human health and critical levels for the protection of vegetation. Compliance with the European Union (EU) Limit Values is mandatory. However, Member States can apply for a time extension for compliance, subject to approval of an action plan by the European Commission.

In December 2015, the Department for Environment Food and Rural Affairs (Defra) on behalf of the UK Government produced plans to improve air quality in the UK to meet the EU targets in the shortest possible time⁵. The adequacy of these plans to bring about the necessary improvements in air quality to meet the relevant national air quality objectives (NAQO) within the shortest time possible were successfully challenged within the High Court in 2016⁶.

Subsequently, in 2017 a plan for the reduction in roadside NO₂ concentrations was released⁷ which requires local authorities to identify local actions to accelerate the improvement in air quality in their jurisdictions. It also includes the national measures, including banning the sale of conventionally powered cars and light goods vehicles by 2040 and further investment in cleaner transport.

3.1.2 Clean Air Strategy, 2019

Defra published a new Clean Air Strategy 2019⁸ in January 2019, setting out how the UK will significantly reduce harmful air pollutant emissions by 2020 and 2030. The Clean Air Strategy contains an intention of working towards the World Health Organisation guideline value for PM_{2.5} of 10µg/m³. The timetable for this has not been set.

3.1.3 Local Air Quality Management

Part IV of the Environment Act 1995⁹, requires the UK Government to publish an Air Quality Strategy and local authorities to review, assess and manage air quality within their areas. This is known as Local Air Quality Management (LAQM).

The 2007 Air Quality Strategy¹⁰ establishes the policy for ambient air quality in the UK. It includes the NAQOs for the protection of human health and vegetation for 11 pollutants. Those

³ Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

⁴ Secretary of State, 2010. Statutory Instrument 2010 No. 1001, Air Quality Standards Regulations 2010. HMSO.

⁵ Defra, December 2015. Improving air quality in the UK, Tackling nitrogen dioxide in our towns and cities, UK overview document. Defra.

⁶ Royal Courts of Justice, 2016. Neutral Citation Number: [2016] EWHC 2740 (Admin). Case No: CO/1508/2016.

⁷ Department for Environment, Food and Rural Affairs, 2017. UK plan for tackling roadside nitrogen dioxide concentrations. Defra.

⁸ Defra, 2019. Clean Air Strategy.

⁹ Secretary of State, 1995. The Environment Act part IV Air Quality, HMSO.

¹⁰ Department for Environment, Food and Rural Affairs, 2007. Air Quality Strategy for England, Scotland, Wales and Northern Ireland. HMSO.

NAQOs included as part of LAQM are prescribed in the Air Quality (England) Regulations 2000 and the Air Quality (Amendment) (England) Regulations 2002. Table 3.1 presents the NAQOs for NO₂ and PM₁₀, the two pollutants of most concern in urban areas.

Table 3.1: Objectives Included in Air Quality Regulations (England) 2000 for Purpose of Local Air Quality Management

Pollutant	Air Quality Objective		
	Concentration	Measured As	Date to be Achieved By
NO ₂	200 micrograms per metre cubed (µg/m ³) not to be exceeded more than 18 times per year	1 hour	31 December 2005
	40 µg/m ³	Annual mean	
PM ₁₀	50 µg/m ³ not to be exceeded more than 35 times per year	24 hour mean	31 December 2004
	40 µg/m ³	Annual mean	

Analysis of long-term monitoring data suggests that if the annual mean NO₂ concentration is less than 60 µg/m³ then the one-hour mean NO₂ objective is unlikely to be exceeded where road transport is the main source of pollution¹¹. Therefore, in this assessment this concentration has been used to screen whether the one-hour mean objective is likely to be achieved. Similar to NO₂, a PM₁₀ annual mean below 32 µg/m³ is used to screen whether the 24-hour PM₁₀ mean objective is likely to be achieved.

The 2007 Air Quality Strategy also introduced a new policy framework for tackling PM_{2.5} which included an exposure reduction target and a 'backstop' annual mean NAQO. The exposure reduction target is focussed on reducing average concentrations across the most polluted urban areas and is therefore not applicable to individual schemes, whilst the annual mean NAQO can be considered a concentration cap to ensure environmental compliance. The UK NAQOs for PM_{2.5} are provided in Table 3.2.

Table 3.2: UK Objectives for PM_{2.5}

Averaging Period	Objective	Target Date
Annual mean	25 µg/m ³	2020
3 year running annual mean	15 % reduction in concentrations measured at urban background sites	Between 2010 and 2020

The NAQOs apply to external air where there is relevant exposure to the public over the associated averaging periods within each NAQO. Guidance is provided within LAQM.TG (16)¹¹ issued by Defra for Local Authorities, on where the NAQOs apply, as detailed in Table 3.3. The NAQOs do not apply in workplace locations, to internal air or where people are unlikely to be regularly exposed (i.e., centre of roadways).

¹¹ Department for Environment, Food and Rural Affairs, 2016. Local Air Quality Management Technical Guidance LAQM.TG (16). HMSO.

Table 3.3: Locations Where National 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 etc.	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.
24 Hour 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 façade), or any other location where public exposure is expected to be short term.
1 Hour Mean	All locations where the annual mean and: 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expect to spend one hour or longer.	

It should be noted that the EU Limit Values are numerically the same as the NAQO values but differ in terms of compliance dates, locations where they apply and legal responsibility. The compliance date for the NO₂ Limit Values was 1 January 2010, which was five years later than the date for the NAQO.

The Limit Values are mandatory whereas the NAQOs are policy objectives. Local authorities are not required to achieve them but must demonstrate effort of working towards their achievement. In addition, the Limit Values apply in all locations except:

- where members of the public do not have access and there is no fixed habitation;
- on factory premises or at industrial installations; and
- on the carriageway/central reservation of roads except where there is normally pedestrian access.

Where a local authority's review and assessment of its air quality identifies that air quality is likely to exceed the NAQOs, it must designate these areas as AQMAs and draw up an Air Quality Action Plan (AQAP) setting out measures to reduce pollutant concentrations with the aim of meeting the NAQOs.

3.1.4 National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹² sets out the Government's planning policies for England and how they are expected to be applied. In relation to achieving sustainable development, paragraph 8 states that:

"Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):...

c) an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

Paragraph 105 states:

"Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health."

Paragraph 174 on conserving and enhancing the natural environment states:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: ...

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land stability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality ..."

Paragraph 180 within ground conditions and pollution states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."

Paragraph 186 states that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

Paragraph 187 states that:

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions

¹² Ministry of Housing, Communities & Local Government, 2021. National Planning Policy Framework. HMSO

placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed".

3.1.5 Planning Practice Guidance

The Planning Practice Guidance (PPG)¹³ was launched as an online resource in March 2014 to support the NPPF and has separate guidance on air quality. Paragraph 001, Reference 32-001-20191101 06 (revision date 01 11 2019) of the PPG provides the following summary as to why air quality is a consideration for planning:

"... It is important that the potential impact of new development on air quality is taken into account in planning where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified."

The PPG identifies when air quality could be relevant for a development management process, provides guidance on how detailed an assessment needs to be and provides guidance on how an impact on air quality can be mitigated.

3.2 Regional Planning Policy

3.2.1 Reading Borough: Local Plan 2019

The RBC Local Plan¹⁴ is the document that contains the policies for how Reading will develop up to 2036. The plan was adopted in 2019 and identifies the amount of development that will take place, the areas and sites where development is expected to be accommodated, and where it will be restricted, and sets out policies for how planning applications will be decided. It also contains planning policies to ensure that new development address economic, environmental, and social needs of the area

The policies within the Local Plan in relation to air quality are as follows:

In EN15 Air Quality it is stated:

'Development should have regard to the need to improve air quality and reduce the effects of poor air quality.

- i. Development that would detrimentally affect air quality will not be permitted unless the effect is to be mitigated. The following criteria should be taken into account:*
 - Whether the proposal, including when combined with the cumulative effect of other developments already permitted, would worsen air quality;*
 - Whether the development is within, or accessed via, an Air Quality Management Area; and*
 - Whether it can be demonstrated that a local worsening in air quality that would not detrimentally affect human health or the environment would be offset by an overall improvement in air quality, for instance through reduction in the need to travel.*
- ii. Where a development would introduce sensitive uses (such as residential, schools and nurseries, hospitals, care facilities) into, or intensify such uses within, an Air Quality*

¹³ Ministry of Housing, Communities & Local Government, 2014. Planning Practice Guidance. 'Air Quality'.

¹⁴ Reading Borough Council, 2017. Reading Borough Local Plan. Adopted November 2019.

Management Area, detrimental effects on that use will be mitigated. Mitigation measures should be detailed in any planning application. If there are significant detrimental effects that cannot be mitigated, the application should be refused.

- iii. *Where required, planning obligations will be used to secure contributions to measures to tackle poor air quality or for air quality monitoring.'*

In EM1: Provision of Employment Development, it is stated:

'Freight consolidation centres are locations which serve as a single point for deliveries to a specific area, which are then distributed within the area by fewer vehicles, potentially low emission vehicles, thus reducing congestion and helping to improve air quality.'

In TR1: Achieving the Transport Strategy, it is stated:

'The Council's objectives for transport set out in the Local Transport Plan (2011-2026) are:

... To reduce carbon emissions from transport, improve air quality and create a transport network which supports a mobile, affordable low-carbon future.'

In CR6: living in Central Reading, is it stated:

'Proposals for new residential development within the central area will be required to demonstrate how the issue of potential noise disturbance from neighbouring land uses and other sources, and air quality implications of residential development, have been considered and if necessary, mitigated.'

In CR10: Tall Buildings, it is stated:

'Tall buildings that include residential will need to take account of noise and air quality issues in the same way as all additional residential development.'

The requirements of these policies were taken into consideration in this air quality assessment.

3.3 Additional Guidance

3.3.1 Institute of Air Quality Management: Construction Dust Guidance, 2014 v1.1

The IAQM¹⁵ produced guidance to assist in the assessment of air quality impacts from demolition and construction activities. This guidance provides a consistent methodology for assessing the risks of dust impacts from demolition and construction activities and for identifying the correct level of mitigation which should be applied to avoid significant air quality effects.

3.3.2 Environmental Protection UK/Institute of Air Quality Management Guidance, Land-Use Planning Guidance

Environmental Protection UK (EPUK), together with the IAQM, produced updated guidance in 2017² on how air quality impacts should be assessed within the land-use planning and development control process. This guidance provides clear criteria to determine when a detailed air quality assessment is required and a methodology for assessing the significance of air quality effects.

¹⁵ Holman et al, 2014. IAQM Guidance on the assessment of dust from demolition and construction V1.1. Institute of Air Quality Management, London.

3.3.3 Institute of Air Quality Management: Guidance on the assessment of odour for planning, 2018, v1.1

The IAQM¹⁶ produced guidance to assist in the assessment of odour impacts for planning. The guidance provides a consistent methodology for assessing the potential for significant odour effects to occur which could have an impact on the amenity of receptors.

3.3.4 Defra, Local Air Quality Management Technical Guidance (LAQM TG16), 2016

Defra, in association with devolved regional environmental protection agencies, has produced technical guidance¹⁷ designed to support local authorities in pursuit of their duties under the Environment Act 1995. It provides the methodology by which key air pollutants such as NO₂, PM₁₀ and PM_{2.5} should be monitored, assessed, and reported for the purposes of local air quality management and provides guidance on the actions to be taken by local authorities to improve local air quality. Whilst London has its own system of LAQM with guidance prepared by the Mayor of London, it in turn refers to this Technical Guidance.

¹⁶ Institute of Air Quality Management, 2018. Guidance on the assessment of odour for planning, version 1.1. July 2018.

¹⁷ Department for Environment, Farming and Rural Affairs, 2016. Local Air Quality Management Technical Guidance (England) 2016 (TG16). HMSO.

4. ASSESSMENT METHODOLOGY

4.1 Baseline

To establish baseline air quality in the study area, RBC monitoring data was collected, reviewed, and assessed. Data was obtained from the following sources:

- Diffusion tubes monitoring operated by RBC, and RBC Annual Status Report¹⁸; and
- Department of Environment, Food and Rural Affairs (Defra) background maps¹⁹.

No additional site-specific air quality monitoring was carried out.

4.2 Construction Phase Assessment

The Application Site is relatively small scale and therefore construction activities on the site will be minimal, and significant impacts arising from construction dust emissions are unlikely. A list of standard mitigation measures for low-risk sites is provided in Table 7.1, with these in place, the residual effect of construction dust impacts on air quality will not be significant.

4.3 Operational Phase Traffic Assessment

4.3.1 Introduction

The potential impact on local air quality of traffic movements generated by the proposed development were screened using the methodology detailed in the latest IAQM/EPUK outlined in Section 3.3.2.

This document sets out criteria for increases in traffic flows and Heavy Duty Vehicles (HDV) movements, above which a detailed assessment of air quality impacts may be required. If increases in traffic flows and HDV movements are below the criteria, there are unlikely to be any significant air quality impacts as a result of the development and a detailed assessment of air quality is not necessary.

If the criteria are exceeded, either a simple or detailed assessment should be undertaken. Where it can be concluded that a significant impact on local air quality is unlikely to occur, a simple assessment can be carried out. If significant impacts are possible, then detailed dispersion modelling may be required.

A screening assessment of development traffic has been undertaken by comparing the level of development traffic with thresholds against the criteria set out in Table 4.1.

Table 4.1: IAQM and EPUK Road Traffic Assessment Criteria

Vehicle Type	Criteria
Light Duty Vehicles (LDVs)	A change in annual average daily traffic (AADT) of more than 100 within or adjacent to an AQMA, or more than 500 elsewhere
HDVs	An increase in HGV movements of more than 25 per day within or adjacent to an AQMA, or more than 100 elsewhere

¹⁸ Reading Borough Council, 2020. 2020 Air Quality Annual Status Report (ASR). November 2020.

¹⁹ <https://uk-air.defra.gov.uk/data/iaqm-background-home>

4.4 Odour Assessment Methodology

4.4.1 Introduction

Section 4.2 of the IAQM guidance sets out the approach to the assessment of odour for differing situations. In the case of assessing site suitability for a proposed development around an existing odour source, the normal approach would be to use predictive methods to complement observational methods.

4.4.2 Predictive methodology

Predictive methods can be either qualitative or detailed modelling, depending on the availability of data and the magnitude of the potential odour concern. In the case of the WWTP and waste recycling centre, these sites have the potential to be significant odour sources and affect the residential amenity on the site. A source-pathway-receptor approach has initially been used to consider the risk of odour exposure and therefore the magnitude of the odour effect on the site. The source-pathway-receptor approach is illustrated in Table 4.2, Table 4.3 and Table 4.4 which are taken from the IAQM guidance¹⁶.

Table 4.2: Examples of risk factors for odour source, pathway and receptor sensitivity

Source Odour Potential	Pathway Effectiveness	Receptor Sensitivity
Factors affecting the source odour potential include: - The magnitude of the odour release (taking into account odour control measures) - How inherently odorous the compounds are - The unpleasantness of the odour	Factors affecting the odour flux to the receptor are: - Distance from source to receptor - The frequency (%) of winds from the source to receptor (or, qualitatively, the direction of receptors from source with respect to prevailing wind) - The effectiveness of any mitigation/control in reducing flux to the receptor - The effectiveness of dispersion/dilution in reducing the odour flux to the receptor - Topography and terrain	For the sensitivity of people to odour, the IAQM recommends that the air quality practitioner uses professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the following general principles:
<u>Large Source Odour Potential</u> Magnitude – larger Permitted processes of odorous nature or large STWs; materials usage hundreds of thousands of tonnes/m3 per year; area sources of thousands of m3. The compounds involved are very odorous (e.g. mercaptans), having very low Odour Detection Thresholds where known. Unpleasantness – processes classed as 'most offensive', or where compounds/odours having unpleasant to very unpleasant hedonic score. Mitigation/control – open air operation with no containment, reliance solely on good management techniques and best practice.	<u>Highly Effective Pathway for Odour Flux to Receptor</u> 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, receptor 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.	<u>High sensitivity receptor</u> Surrounding land where - Users can reasonably expect enjoyment of a high level of amenity; and - The 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.
<u>Medium Source Odour Potential</u> Magnitude – smaller Permitted processes or small STWs; material usage thousands of tonnes/m3 per year, area sources of hundreds of m3.	<u>Moderately Effective Pathway for Odour Flux to Receptor</u> Distance – receptor is local to the source. Where mitigation relies on dispersion/dilution – releases are	<u>Medium sensitivity receptor</u> Surrounding land where Users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect

The compounds involved are moderately odorous. Unpleasantness – processes classed as 'moderately offensive', or odours having a neutral to offensive hedonic score. Mitigation/control – some mitigation measures in place, but significant residual odour.	elevated, but compromised by building effects.	to enjoy the same level of amenity as in their home, or People 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. Examples may include places of work, commercial/retail premises and playing/recreation fields.
<u>Small Source Odour Potential</u> Magnitude – falls below Part B threshold; materials usage hundreds of tonnes/m³ per year, area sources of tens m³. The compounds included are only mildly odorous, having relatively high odour detection thresholds. Unpleasantness – processes classified as less offensive; or compounds/odours having neutral to very pleasant hedonic score. Mitigation/control – effective, tangible mitigation measures in place leading to little or no residual odour.	<u>Ineffective Pathway for Odour Flux to Receptor</u> Distance – receptor is remote from the source, distance exceeds any official set-back distance. 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 – release are from high level (i.e. stacks or roof vents +3m above ridge height) and are not compromised by surrounding buildings	<u>Low sensitivity receptor</u> 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 be present for only limited periods of time as part of the normal pattern of use of the land. Examples may include industrial, farms, footpaths and roads.

The odour source potential, pathway effectiveness and receptor sensitivity factors are combined together as shown in Table 4.2 and Table 4.3 to provide the risk of odour exposure and the magnitude of the odour effect.

Table 4.3: Risk of Odour Exposure

Pathway Effectiveness	Source Odour Strength		
	Small	Medium	Large
Highly Effective	Low Risk	Medium Risk	High Risk
Moderately Effective	Negligible Risk	Low Risk	Medium Risk
Ineffective	Negligible Risk	Negligible Risk	Low Risk

The risk category is combined with the receptor sensitivity to give the odour effect for different receptor classes in Table 4.4.

Table 4.4: Magnitude of Odour Effect

Risk of Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
High	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
Medium	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
Low	Negligible Effect	Negligible Effect	Slight Adverse Effect
Negligible	Negligible Effect	Negligible Effect	Negligible Effect

For Environmental Impact Assessment, where the effect is moderate or substantial this is judged to be a significant effect, a negligible or slight adverse effect would be 'not significant'. In addition, the guidance states that:

'Concluding that an effect is significant should not mean, of itself, that a development proposal is unacceptable and the planning application should be refused; rather, it should mean that careful

consideration needs to be given to the consequences, scope for securing further mitigation, and the balance with any wider environmental, social and economic benefits that the proposal would bring.'

4.4.3 Observational Methodology

As noted in section 4.4.1, it is normal practice to complement predictive assessments with observational assessments. Observational assessments can involve specific odour surveys (i.e. sniff tests), or a review of the complaints history of a site. As the Application site is currently unoccupied there isn't a complaints history for the site.

5. BASELINE CONDITIONS

5.1 Existing Baseline

5.1.1 Local Air Quality Management

The pollutants of concern in relation to the Application Site are nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}). RBC have one large AQMA, covering all the major arterial roads in and out of the town as well as the central area. The AQMA is declared for the exceedance of the annual mean NO₂ objective. The main sources of air pollution in the borough are road traffic emissions and the primary air quality concern regarding the Application Site is its proximity to the A33, which is included within the Reading AQMA. The proposed Application site is approximately 280m west of the AQMA.

The most recent Annual Status Report (ASR) indicates that in general pollution trends across RBC are improving with exceptions in localised areas.

5.1.2 Monitoring

Nitrogen Dioxide

RBC monitored air quality at three automatic monitoring sites: RD1, RD3 and RD4. The council also undertook diffusion tube monitoring at 60 sites in 2019. The closest monitoring locations to the proposed development site are shown in Figure 5.1. Monitoring results from 2015 – 2019 are presented in Table 5.1.

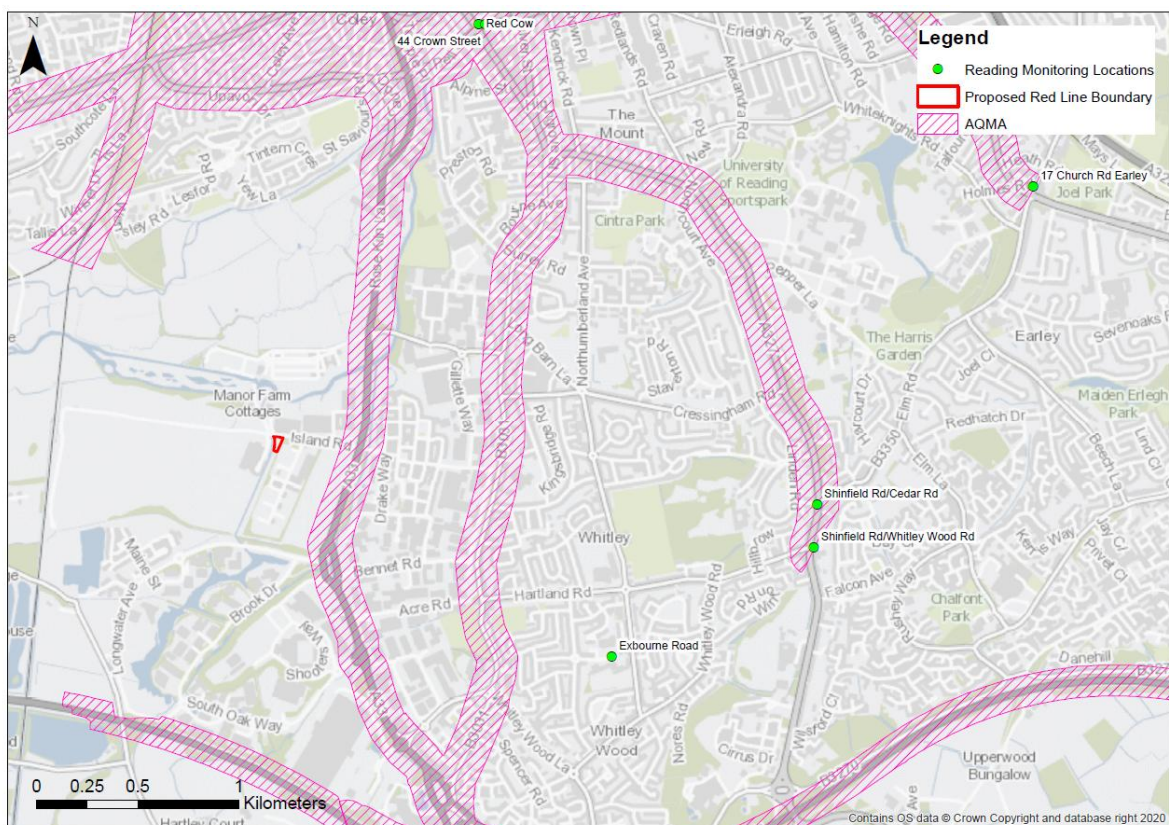


Figure 5.1: Air Quality Diffusion Tube Monitoring Locations

Table 5.1: NO₂ Measured Concentrations in Proximity to the Proposed Development

Site Code	Site Location	Site Type	Distance to Site (km)	Annual Mean (µg/m ³)				
				2015	2016	2017	2018	2019
Exbourne Road	Exbourne Road	R	1.9	-	-	-	-	15
Shinfield Rd/Whitley Wood Rd	Shinfield Rd/Whitley Wood Rd	R	2.6	30	34	31	31	26
Shinfield Rd/Cedar Rd	Shinfield Rd/Cedar Rd	R	2.6	39	42	38	34	34
Red Cow	Red Cow	R	2.3	38	38	35	38	31
44 Crown Street	44 Crown Street	R	2.3	36	37	35	34	29
Objective								40
Exceedances of the NO ₂ annual mean AQO of 40 µg/m ³ are shown in bold								

The monitored results from presented in Table 5.1 show an overall decrease in NO₂ at all sites between 2015 and 2019.

All the monitored results from 2015 to 2019 are below the 40 µg/m³ objective, except for the roadside sites Shinfield Rd/Cedar Rd 2016 result, where concentrations exceeded the objective. Exceedances of the hourly mean objective are unlikely as the annual mean NO₂ concentrations have remained below 60 µg/m³ from 2015 – 2019.

Particulate Matter

RBC also undertake PM₁₀ and PM_{2.5} automatic continuous monitoring at sites RD1, RD3, RD4 (PM₁₀ only) and the Reading New Town AURN. The nearest monitoring site is located at the Reading New Town AURN, approximately 3.6km north east of the site. Monitoring results from 2016 – 2019 are presented in Table 5.2 and Table 5.4.

Table 5.2: Measured PM₁₀ Concentrations

Site Code	Site Location	Site Type	Distance to Site (km)	Annual Mean (µg/m ³)				
				2015	2016	2017	2018	2019
Reading AURN	Reading New Town AURN	UB	3.6	12	13	12	13	13
RD1	Caversham Rd	R	3.6	28	20	23	24	24
RD3	Oxford Rd	R	3.8	23	22	21	23	21
RD4	London Rd	R	3.9		19	18	17	17
Objective								40
Exceedances of the PM ₁₀ annual mean AQO of 40 µg/m ³ are shown in bold								

Table 5.3: Measured PM_{2.5} concentrations

Site Code	Site Location	Site Type	Distance to Site (km)	Annual Mean (µg/m ³)				
				2015	2016	2017	2018	2019
Reading AURN	Reading New Town AURN	UB	3.6	7	9	10	7	8
Objective								25
Exceedances of the PM _{2.5} annual mean AQO of 40 µg/m ³ are shown in bold								

5.1.3 Background Concentrations

In addition to measured concentrations, estimated background concentrations nearest the site have been obtained from the national maps provided by Defra¹⁹ (given in Table 5.4).

Table 5.4: Adjusted Background Mapping for the study area (µg/m³)

Year	Grid Reference (x, y)	NO ₂	PM ₁₀	PM _{2.5}
2019	470500, 170500	15.2	14.7	9.8
	471500, 170500	17.1	15.3	10.5
Objective		40	40	25

The predicted background concentrations are well below the NAQOs.

5.1.4 Assessment of Baseline Data

The monitoring data presented in Table 5.1, Table 5.2 and Table 5.3 shows that ambient pollutant concentrations are well below their respective annual mean NAQO even at roadside monitoring sites. As the Application Site is located over 200m from the nearest main road, pollutant concentrations at the site are likely to be close to the Defra background map values.

6. OPERATIONAL PHASE AIR QUALITY ASSESSMENT

6.1 Site Suitability

The proposed Application Site is not within an AQMA. As discussed in section 5.1.4, the monitoring data and the data from the background maps shows that pollutant concentrations within the proposed development site are well below their respective annual mean NAQOs.

The proposed Application Site will include seven caravan pitches with two parking spaces available per pitch. Development traffic will therefore be well below the EPUK/IAQM thresholds set out in Table 4.1 for an assessment to be necessary within or outside of an AQMA, and therefore development traffic will not have a significant impact on existing air quality within the site. Overall, the development site is therefore suitable for residential development without the need for mitigation against road traffic emissions.

6.2 Impact of Development Traffic

As noted above, development traffic will be below the thresholds for an assessment to be necessary within an AQMA. The air quality impact from the proposed development on the AQMA along the A33 will therefore be insignificant.

7. CONSTRUCTION DUST MITIGATION

7.1 Mitigations measures

As discussed in section 4.2, the scale of the development is such that minimal construction will be required, and any significant impacts arising from construction dust emissions are unlikely. Appropriate mitigation measures are provided in Table 7.1, with these in place, any potential residual effect of construction impacts on air quality will be not significant.

Table 7.1: Recommended Dust Mitigation Measures

Phase	Mitigation Measure
Communications	Implement a stakeholder communication plan.
	Display name and contact details of responsible person for dust issues on Site boundary in addition to head/regional office contact information.
Dust Management Plan	Develop and implement a Dust Management Plan (DMP), to be approved by the Local Authority.
Site management	Take appropriate measures to reduce emissions in a timely manner, and record the measures taken within the log.
	Make the complaints log available to the Local Authority if requested.
	Record any exceptional dust incidents on or off site.
Monitoring	Carry out regular inspections to ensure compliance with the DMP and record results in the site log book. Increase the frequency of inspections during activities with a high potential to create dust or in prolonged dry weather.
Preparing and maintaining the site	Use solid screens around dusty activities and around stockpiles.
	Avoid site runoff of water and mud.
	Remove dusty materials from site as soon as possible. Minimise emissions from stockpiles by covering, seeding, fencing or damping down.
Operating vehicles and machinery	Ensure vehicles switch off engines when stationary.
	Avoid use of generators where possible.
	Produce a Construction Logistics Plan to manage the sustainable delivery of materials.
Operations	Cutting, grinding or sawing equipment only to be used with suitable dust suppression equipment or techniques.
	Ensure adequate water supply for effective dust and particulate matter suppression.
	Use enclosed chutes, conveyors and covered skips.
Waste management	Ensure suitable cleaning material is available at all times to clean up spills.
	Avoid bonfires.

8. ODOUR IMPACT ASSESSMENT

8.1 Predictive Assessment

A predictive assessment of the likelihood of adverse odour impacts from the WWTP and waste recycling centre has been undertaken in accordance with the IAQM procedure outlined in Section 4.4.2.

8.1.1 Source Strength

The first step of the assessment requires an estimation of the odour-generating potential of the site activities, taking into account the magnitude of release, how inherently odorous the release is and the relative pleasantness/unpleasantness of the odour (hedonic tone).

The principal sources of odour will be the WWTP and the waste recycling centre, both of which are in close proximity of the proposed development. In accordance with Table 4.2, the source strength of the WWTP is considered to be medium as the principal sources of odour on the site are enclosed. Similarly, for the waste recycling centre, the activities take place indoors and therefore the source strength is also considered to be medium. In both cases it is considered that the compounds involved are moderately odorous.

8.1.2 Pathway Effectiveness

The wind-rose for Farnborough Airport (approximately 21.5 km south east of the site) for the period 2015 – 2016 and 2018 - 2019 indicates that there is a high frequency of winds from the south westerly direction. There is only a small proportion of winds from the north, with winds blowing from the WWTP to the development site approximately 16% of the time and winds blowing from the recycling centre approximately 38% of the time.

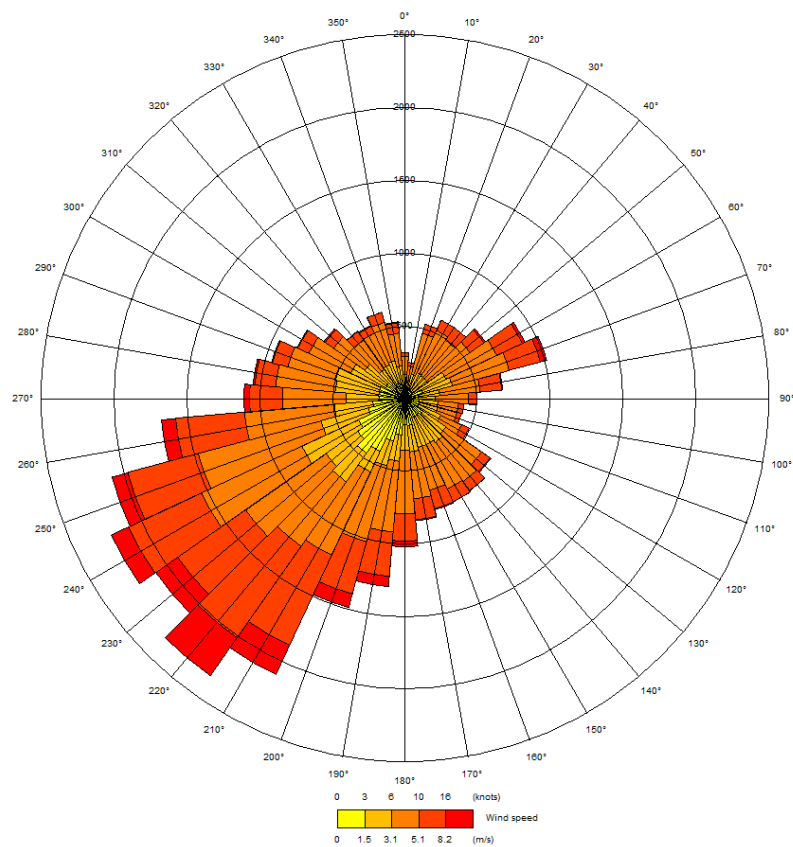


Figure 8.1: Farnborough Airport Wind Rose 2015 – 2016 and 2018 - 2019

In accordance with Table 4.2, the Application Site is adjacent to the WWTP and waste recycling centre, in addition the frequency of winds blowing from the sources to the receptor is relatively high. The pathway effectiveness for the development site is therefore considered to be highly effective.

8.1.3 Risk of Odour Exposure

In accordance with Table 4.3, the risk of odour exposure would be medium for a highly effective pathway from a source of medium strength.

8.1.4 Magnitude of Odour Effect

The receptor sensitivity is considered high, as users can be continuously present and would expect a high level of amenity. The summary of the assessment is presented in Table 8.1 for the level of risk identified in 8.1.3.

Table 8.1: Magnitude of Odour Effect

Receptor	Odour Exposure
	Medium
Proposed Application Site	Moderate Adverse Effect

For the proposed Application Site, the magnitude of the odour effect is judged to be moderately adverse based on the predictive method.

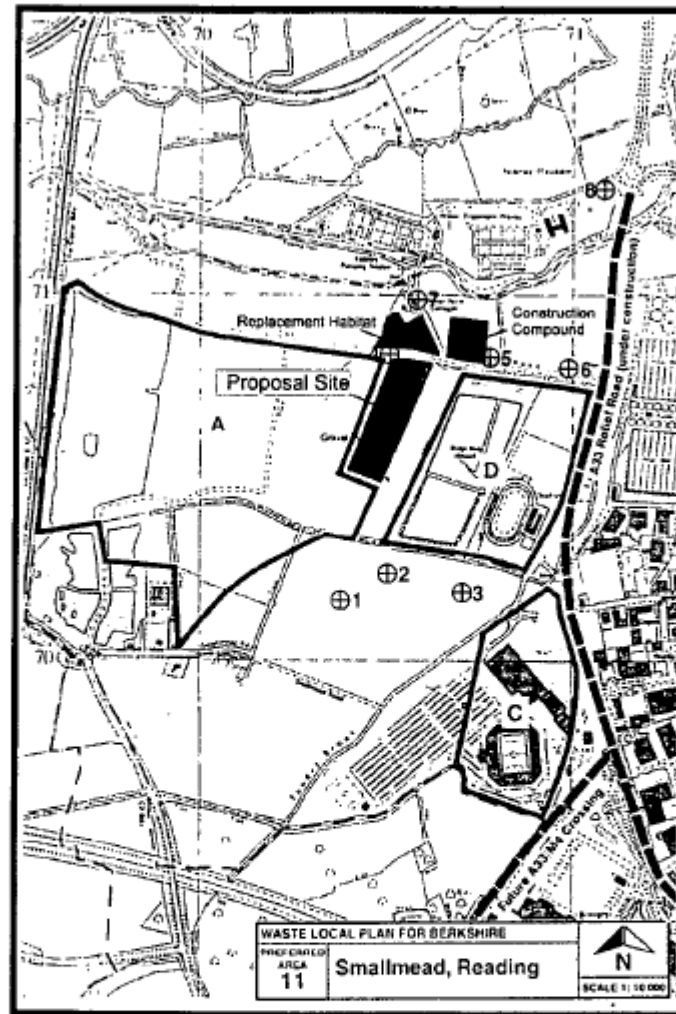
8.2 Observational Assessment

As part of the Environmental Statement (ES) for construction of the waste recycling centre, a baseline odour assessment was conducted²⁰. A sniff test was undertaken by Enviro, at eight locations in and around the proposed waste management site, shown in Figure 8.2 (over leaf).

During the survey the wind direction was northerly, and the survey was undertaken in November with recorded temperatures of 3°C – 5°C over a two-hour period. The survey was therefore not undertaken during a period when odour generation from the WWTP would likely be highest.

The results of the survey was that a range of odours were detected. The strongest odour detected was a frequent strong odour of landfill/refuse at location 5, most likely originating from the Burghfield landfill, which is no longer in operation. The only other location at which waste-type odours were detected was location 4, just to the north of the proposed development site. Odour from the WWTP was not detected at locations 1 to 3.

²⁰ RMPL (2006), Island Road, Reading, Development of a Waste Management Centre, Environmental Statement



Extract From Waste Local Plan for Berkshire
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Key

⊕ 1 Odour Assessment Location

SCALE: NTS

CAN: WA0640100

CONTENT: FHL

DRAWN: FHL

DATE: April 2006

Odour Assessment at Smallmead, Reading - Proposed
Redevelopment of Waste Transfer Station

FIGURE 1

Odour Assessment Locations, Smallmead
Waste Transfer Proposal, Reading



WRG

Figure 8.2: Enviros Odour Assessment Locations

8.3 Conclusions

The results from the predictive assessment suggest that odour from the WWTP and recycling centre are likely to have a moderate adverse effect on the proposed Application Site. This is primarily due to the proximity of the proposed development site to these odour sources. The predictive assessment result isn't consistent with the odour survey undertaken for the waste recycling centre ES in that odour from the WWTP wasn't detected at the time of that survey. However, this could have been due to the relatively low temperatures at the time of the survey as odour impacts will be higher during warmer temperatures.

Overall, it is concluded that there is the potential that odour from the WWTP and waste recycling centre will have a moderate adverse effect on amenity within the proposed development site. This is a provisional conclusion based on the information currently available.

SUMMARY AND CONCLUSIONS

The air quality impacts associated with the proposed Application Site of the land south of Island Road, Reading, located within the administrative boundary of the RBC, have been assessed.

During construction it is recommended that a package of mitigation measures is put in place to minimise the risk of elevated PM₁₀ concentrations and dust nuisance in the surrounding area. With mitigation in place the construction impacts are judged to be not significant.

The Application Site is not within an AQMA and is likely to be suitable for residential development without the need for mitigation against road traffic emissions. The Application Site will not generate significant volumes of traffic and will not have a significant impact on local air quality.

The outcome of the odour assessment is that there is the potential that odour from the WWTP and waste recycling centre will have a moderate adverse effect on amenity within the proposed development site. This is a provisional conclusion based on the information currently available.

APPENDIX 1
GLOSSARY

Abbreviations	Meaning
AADT	Annual Average Daily Traffic
ADMS	Air Dispersion Modelling System
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
CHP	Combined Heat and Power
CEMP	Construction Environmental Management Plan
Defra	Department for Environment, Food and Rural Affairs
Diffusion Tube	A passive sampler used for collecting NO ₂ in the air
EFT	Emission Factor Toolkit
EHO	Environmental Health Officer
EPUK	Environmental Protection UK
ha	Hectares
HDV	Heavy Duty Vehicle; a vehicle with a gross vehicle weight greater than 3.5 tonnes. Includes Heavy Goods Vehicles and buses
HWS	Household Waste Site
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle; a vehicle with a gross vehicle weight less than or equal to 3.5 tonnes.
NAQO	National Air Quality Objective as set out in the Air Quality Strategy and the Air Quality Regulations
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen oxides, generally considered to be nitric oxide and NO ₂
NPPF	National Planning Policy Framework
NRMM	Non-Road Mobile Machinery
PM ₁₀ /PM _{2.5}	Small airborne particles less than 10/2.5 microns in aerodynamic diameter
PPG	Planning Practice Guidance
Receptor	A location where the effects of pollution may occur
RBC	Reading Borough Council
SPG	Supplementary Planning Guidance
(µg/m ³)	Micrograms per metre cubed

APPENDIX 2

DUST RISK ASSESSMENT METHODOLOGY

Determining Dust Emission Magnitude

Large	Medium	Small
Demolition - total building volume >50,000 m³ - potentially dusty construction material (e.g. concrete) - on-site crushing and screening - demolition activities >20 m above ground level	- total building volume 20,000m³ – 50,000m³ - potentially dusty construction - demolition activities 10-20m above ground level	- total building volume <20,000m³ - construction material with low potential for dust release (e.g. metal cladding or timber) - demolition activities <10m above ground - during wetter months
Earth works - total site area >10,000m² - potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) >10 heavy earth moving vehicles active at any one time - formation of bunds >8m in height - total material moved >100,000 tonnes	- total site area 2,500m² - 10,000m² - moderately dusty soil type (e.g. silt) 5-10 heavy earth moving vehicles active at any one time - formation of bunds 4m - 8m in height - total material moved 20,000 - 100,000 tonnes	- total site area <2,500m² - soil type with large grain size (e.g. sand) <5 heavy earth moving vehicles active at any one time - formation of bunds <4m in height - total material moved <20,000 tonnes - earthworks during wetter months
Construction - total building volume >100,000m³ - piling - on-site concrete batching - sandblasting	- total building volume 25,000m³ - 100,000m³ - potentially dusty construction material (e.g. concrete) - piling - on-site concrete batching	- total building volume <25,000 m³ - construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout >50 HDV (>3.5t) movements in any one day - potentially dusty surface material (e.g. high clay content) - unpaved road length >100m	10-50 HDV (>3.5t) movements in any one day - moderately dusty surface material (e.g. high clay content) - unpaved road length 50m – 100m	<10 HDV (>3.5t) movements in any one day - surface material with low potential for dust release - unpaved road length <50m

Determining Receptor Sensitivity

High	Medium	Low
Sensitivities of People to Dust Soiling Effects		

High	Medium	Low
• users can reasonably expect a 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 a 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, museums and other culturally important collections, medium and long term car parks and car showrooms.	• 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 include parks and places of work.	• the enjoyment of amenity would not reasonably be expected; or • property 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 include playing fields, farmland (Unless commercially-sensitive horticultural), footpaths, short term car parks and roads.
Sensitivities of People to the Health Effects of PM ₁₀		
• locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include residential properties, Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM₁₀, as protection is covered by Health and Safety at Work legislation.	• Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks and shopping streets.
Sensitivities of Receptors to Ecological Effects		
• locations with an international or national designation <i>and</i> the designated features may be affected by dust soiling; or • locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.	• locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or • Locations with a national designation where the features may be affected by dust deposition. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.	• Locations with a local designation where the features may be affected by dust deposition. • Indicative example is a local Nature Reserve with dust sensitive features.

Determining Sensitivity of the Area

Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		< 20	< 50	< 100	< 350
High	> 100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	> 1	Medium	Low	Low	Low
Low	> 1	Low	Low	Low	Low

Human Health Impacts

	Annual Mean PM ₁₀ concentration	Number of Receptors	Distance from the Source (m)				
			< 20	< 50	< 100	< 200	< 350
High	> 32 µg/m ³	> 100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	> 28-32 µg/m ³	> 100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	> 24-28 µg/m ³	> 100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	< 24 µg/m ³	> 100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium		> 1	High	Medium	Low	Low	Low
Low		> 1	Medium	Low	Low	Low	Low

Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	< 20	< 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Determining Risk of Dust Impacts

Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible