



AIR QUALITY AND ODOUR ASSESSMENT

FOR

PROPOSED 8 DUAL PURPOSE VESSEL BLOCK

AT

HEINEKEN UK, MANCHESTER BREWERY

AQ109510R1

SEPTEMBER 2020

Prepared For

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1.0 EXECUTIVE SUMMARY

Ensafe Group were commissioned by Heineken UK Limited to undertake an Air Quality and Odour Screening Assessment in support of a proposed Dual Purpose Vessel (DPV) block at the Heineken Brewery, Denmark Road, Manchester.

The proposals comprise the construction and operation of a new build DPV block, containing 8 vertical vessels, situated within the boundary of the existing site. The vessels combine two processes, fermentation and conditioning.

Operation of the new DPV block will remain unchanged from the current procedures, however the site will experience an increase in production, which may result in Air Quality and Odour impacts during the operation. There is also potential for fugitive dust impacts to arise during construction processes. A screening assessment has therefore been prepared in order to assess potential impacts as a result of the construction and operations of the proposed DPV block.

Potential construction phase air quality impacts from fugitive dust emissions were assessed on a qualitative basis as a result of demolition, earthworks, construction and trackout activities. It is considered that the use of good practice control measures would provide suitable mitigation for the development and reduce potential impacts to an acceptable level.

With relation to operational impacts a review of previous pollution prevention and control permits for the existing site was undertaken. The review process indicated that emission releases associated with existing fermentation process, similar to the DPVs, were negligible and required no further assessment work. Given the similarities that can be drawn between previous permitted use and the proposed DPV application, impacts relating to pollutant and odour releases are considered not significant.

Based on the level of anticipated traffic generation from the application site the assessment concluded that impacts on road vehicle pollutant emissions as a result of proposed operations are considered to be **not significant** in accordance with relevant screening criteria.

The assessment concluded that the potential for Air Quality, Odour and fugitive dust impacts to arise as a result of the proposed application is negligible and therefore **not significant**. Based on the results of this assessment, it is considered odour issues should not be viewed as a constraint to planning.

1.0 INTRODUCTION

1.1. Background

Ensafe Group has been commissioned by Heineken UK, hereafter referred to as “the Client”, to undertake an Air Quality and Odour Assessment in support of a proposed DPV block at located at the Heineken UK Brewery, Denmark Road, Manchester, herein after referred to as the “Proposed Development”.

1.2. Site Location and Context

The Brewery site is located approximately 1.5 kilometres south of Manchester City Centre, in an area bounded by Princess Road, Greenheys Lane, Charles Halle Road/Denmark Road and Moss Lane East. The application site is located at approximate National Grid Reference (NGR): 383970, 395875. Reference should be made to Figure 1 within Appendix I for a site location and surrounding context.

The proposals comprise:

- A new dual purpose vessel (DPV) Block single storey building with an 8 No. exposed vertical DPV installation and related access gantries over existing installations.

The new DPV block will comprise of fermentation and conditioning process and will aim to increase brewing and storage capacity of completed products. The DPV block will be built in two phases, Phase 1 being a 4-vessel block, and Phase 2 being an extension to Phase 1 with a further 4 vessel block. Given the nature of operations there is potential for the following assessment constraints as a result for the Proposed Development:

- Fugitive dust impacts upon existing receptor locations as a result of demolition and construction activities;
- Air Quality and Odour emission impacts as a result of operation and increased production; and
- Road vehicle exhaust emission impacts, related to increases to deliveries and exports.

Subsequently, there is the potential for the development to cause impacts at nearby sensitive locations during the construction and operational phases. An Air Quality and Odour Screening Assessment has therefore been prepared to identify potential constraints associated with the Proposed Development, and provide consideration to likely significant effects on the surrounding environment.

1.3. Limitations

This report has been produced in accordance with Ensaf Group's standard terms of engagement. Ensaf Group has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Ensaf Group; a charge may be levied against such approval.

2.0 Local Planning Policy

2.1. Manchester City Council Local Planning Policy

The Manchester Local Development Framework (LDF) Core Strategy was formally adopted in 2012 and provides a framework for development within the city. The LDF comprises a number of documents which set out Manchester City Council's (MCC) spatial policy framework for delivering a number of policies contained within the Core Strategy which have been saved in accordance with the Planning and Compulsory Purchase Act (2004) and therefore provide the basis for the determination of planning applications prior to the finalisation of the local development framework.

A review of the Core Strategy indicated the following policy in relation to air quality that relevant to this assessment:

"Policy EN16 - Air Quality

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas."

"Policy DM1 - Development Management

All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:

*Effects on amenity, including privacy, light, noise, vibration, **air quality, odours**, litter, vermin, birds, road safety and **traffic generation**. This could also include proposals which would be sensitive to existing environmental conditions, such as noise."*

Reference has been made to these policies during the preparation of this Air Quality Assessment by considering emission releases during construction and operation phases and determining the significance of potential impacts as a result of the Proposed Development.

3.0 METHODOLOGY

There is the potential for the Proposed Development to cause impacts at sensitive locations during the construction and operational phases. These have been assessed in accordance with the following methodologies.

3.1. Construction Phase Assessment

There is the potential for fugitive dust emissions to occur as a result of construction phase activities associated with the Proposed Development. These have been assessed in accordance with the methodology outlined within the 'Institute of Air Quality Management (IAQM) guidance on the Assessment of Dust from Demolition and Construction'¹.

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling
- Harm to ecological receptors
- The risk of health effects due to a significant increase in exposure to PM₁₀ and PM_{2.5}

A desk top study utilising the MAGIC application² indicated there are no nationally or European designated ecological receptors within 50m of the Site boundary, or within 50m from a route used by construction vehicles on the public highway (up to 500m from the Site entrance). Therefore, the risk of dust effects upon ecological sites have not been considered further in this assessment. Impacts on surrounding human receptors will be assessed further during the assessment.

3.2. Operational Phase Assessment

The application site is located adjacent to the Manchester City Council (MCC) Air Quality Management Area (AQMA) which has been declared for exceedances of the annual mean Air Quality Objective (AQO) for Nitrogen Dioxide (NO₂) (40µg/m³). As a result, there is the potential for the development to further exacerbate conditions within the AQMA and cause impacts to existing air quality within this sensitive area. Emission releases during normal operation as well as road vehicle impacts associated with increased delivery/exports are detailed in the following sections.

3.2.1. Pollutant and Odour Emission Release Impacts

Based on pollution prevention and control permit (PPC) applications undertaken for the wider site, relating to fermenter vessels (FV), it has been confirmed there were no significant changes to pollutant and odour emission releases as a result of the increase to on site FVs. Given the similarities which can be drawn between the nature of the FV and DPV this conclusion has been applied to the current application. Further details are provided in Section 4.2.1.

- Further to this, it has been confirmed there any additional electricity demand as a result of the proposed DPV block will be supplied through national grid connection. No assessment of additional onsite energy plant combustion facilities is required.

1 Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management (IAQM), v1.1, June 2016
2 <https://magic.defra.gov.uk/MagicMap.aspx>

3.2.2. Road Vehicle Exhaust Emission Impacts

The Proposed Development has the potential to cause impacts upon existing air quality as a result of road traffic exhaust emissions generated by additional heavy goods vehicles (HGVs) during increased production. A screening assessment has been undertaken using the criteria contained within the EPUK and IAQM guidance³ to determine the potential for trips generated by the Proposed Development to affect local air quality.

The EPUK and IAQM guidance states the following criteria to help establish when an air quality assessment is likely to be considered necessary:

- Proposals that will cause a change in Heavy Duty Vehicle (HDV) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 elsewhere;

Should the above criteria not be met, the EPUK and IAQM guidance considers air quality impacts associated with the scheme to be negligible and no further assessment is required. Conversely, should the criterion be exceeded it may be deemed necessary that further assessment is required.

³ Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and IAQM, January 2017.

4.0 ASSESSMENT

4.1. Construction Phase Assessment

The desk-study identified a number of sensitive receptors within 350m of the site boundary, and within 50m of the anticipated trackout routes. As such, a detailed assessment of potential dust impacts was required, and summarised in the below sections. Reference should be made to Appendix II for details of the relevant IAQM construction phase assessment criteria, which were utilised in conjunction with site specific information.

4.1.3. Magnitude

The scale and nature of the works was determined to assess the magnitude of dust arising from each construction phase activity. The determination of magnitude was based upon the criteria detailed in Appendix III, with the outcome summarised in Table 1.

Demolition

Demolition will involve the removal of hardstanding surfaces and minimal soft landscaping areas within the application boundary. . The volume of demolition is approximately 500m² and the magnitude of potential dust emissions related to demolition activities is therefore considered **small**.

Earthworks

The Proposed Development site is estimated to cover an area of approximately 500m². Given the existing site use it is not anticipated that major earthworks will be undertaken. The magnitude of potential dust emissions related to earthwork activities is therefore considered **small**.

Construction

The proposals comprise of 8no DPV with a height of approximately 32.5m. The vessels will be constructed of stainless and galvanised steel, with brickwork up to the maximum access door height. Given that the majority of construction materials are of low dust release the magnitude of potential dust emissions related to construction is considered **small**.

Trackout

Information on the number of Heavy-Duty Vehicles (HDV) trips generated during the construction phase was not available at the time of preparing the assessment. The application site, at its maximum, measures approximately 38m in length. Based on the site area, it is anticipated that the unpaved road length is likely to be less than 50m, and the magnitude of potential dust emissions from trackout is considered **small**.

Table 1 summarises the dust emission magnitude of each construction phase activity.

Table 1: Dust Emission Magnitude

Magnitude of Activities			
Demolition	Earthworks	Construction	Trackout
Small	Small	Small	Small

4.1.4. Sensitivity

Dust Soiling

The desk top study indicated are approximately 1 - 10 sensitive receptors within 50m of the Proposed Development boundary and 10 - 100 within 20m of the anticipated trackout routes. It should be noted that the surrounding area consists a mix of commercial and residential uses.

Based on the receptor counts above, the sensitivity of the receiving environment to potential dust soiling impacts was considered to be **medium** for demolition, earthworks and construction phase activities and **high** for trackout phase activities.

Reference should be made to Figures 2 and 3 of Appendix I for a graphical representation of construction activities and trackout buffer zones.

Human Health

The annual mean concentration of PM₁₀ is 12.64µg/m³ as predicted by DEFRA4 (2020). Based on the receptor counts provided above, the area is considered to be of **low** sensitivity for all construction phase activities. The sensitivity of the receiving environment is summarised in Table 2.

Table 2: Sensitivity of the Surrounding Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	high
Human Health	Low	Low	Low	Low

4.1.5. Risk

Both the magnitude and sensitivity factors are combined to determine the risk of dust impacts without the application of best practice mitigation measures. A summary of the risk from each dust generating activity is provided in Table 3.

Table 3: Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	Medium
Human Health	Negligible	Negligible	Negligible	Negligible

4.1.6. Mitigation

The IAQM guidance provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the Proposed Development site as summarised in Table 4 and based on individual risk classification detailed in Table 3.

The mitigation measures outlined in Table 4 can be reviewed prior to the commencement of construction works incorporated into the existing strategies as applicable.

Table 4: Fugitive Dust Mitigation Measures

Issue	Control Measure
Communications	• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager • Display the head or regional office contact information • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.
Site Management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked • Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
Monitoring	• Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary. • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Preparing & Maintaining Site	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive time period • Avoid site runoff of water or mud • Keep site fencing, barriers and scaffolding clean using wet methods • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping.
Operating Vehicle/Machinery & Sustainable Travel	• Ensure all vehicles switch off engines when stationary - no idling vehicles • Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable. • Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un- surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.

Issue	Control Measure
	• Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	• Avoid bonfires and burning of waste materials
Earthworks	• Bag and remove any biological debris or damp down such material before demolition
Demolition	• Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). • Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition
Construction	• Avoid scabbling (roughening of concrete surfaces) if possible • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Trackout	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Record all inspections of haul routes and any subsequent action in a site log book. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

4.1.7. Residual Impacts

Assuming the relevant mitigation measures outlined in Table 4 are implemented, the residual effect from all dust generating activities is predicted to be **not significant** in accordance with the IAQM guidance.

4.2. Operational Phase

4.2.1. Air Quality and Odour Emissions

It has been confirmed by the client the DPVs are fitted with a CO₂ recovery system, similar to that employed on the existing FV. Any emission release from the process are collected via the recovery system and subsequently scrubbed through the gas clean-up undertaken by the recovery plant. This ensures that releases to the environment are minimised.

As stated previously, the proposed DPV are in similar nature to the existing FV blocks and therefore no significant odour and pollutant emission release is anticipated compared to the current operations. Furthermore, any excess emissions not captured and scrubbed by the recovery system will be released at an approximate height of 32.8m. The elevated release height will aid dispersion and provides limited interaction with ground level receptor locations outside the application boundary, thus reducing risk and potential loss of amenity.

A review of the previous PPC permit of the adjacent FV vessels confirmed that emissions release from the vessels are insignificant compared to the brewing process vessels and were determined to be not significant. Given the similarities which can be drawn between the proposed DPV application and existing FV it is concluded that impacts relating to pollutant and odour release are **not significant**.

Additionally, the operation of the DPV will not generate additional onsite emission from combustion plant (as energy demand will be met through national grid supply), and therefore there will be no local air quality impact upon the adjacent Air Quality Management Area.

4.2.2. Road Vehicle Exhaust Impacts

Any additional vehicle movements associated with the Proposed Development will generate exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5} on the local and regional road networks.

Based on data from the client, it is expected that there will be a minor increase to HGVs associated with malt deliveries and product export. It is not anticipated that the operation of the Proposed Development would result in a change of AADT flows of more than 25 HGV movements per day. Subsequently, potential air quality impacts associated with increased deliveries and exports are predicted to be **not significant** in accordance the EPUK and IAQM screening criteria shown in Section 3.2.2.

4.2.3. Combustion Plant Impacts

There is no scope within the Proposed Development to provide any additional combustion processes. As such, potential air quality impacts associated with operational phase combustion emissions are therefore predicted to be **not significant**.

1.0 CONCLUSION

Ensafe Group were commissioned by Heineken UK Limited to undertake an Air Quality and Odour Screening Assessment in support of a proposed (DPV block at the Heineken Brewery, Denmark Road, Manchester.

Operation of the new DPV block will remain unchanged from the current procedures, however the site will experience an increase in production, which may result in Air Quality and Odour impacts during the operation. There is also potential for fugitive dust impacts to arise during construction processes. A screening assessment has therefore been prepared in order to assess potential impacts as a result of the construction and operations of the proposed DPV block.

During the construction phase of the Proposed Development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual potential air quality impacts from dust generated by construction, earthworks and trackout activities was predicted to be **not significant**.

The combination of favourable dispersion aided by the 32.5m release height, and CO₂ recovery systems are sufficient to screen out a detailed assessment of emissions related to the DPV block. Additionally, given the similarities that can be drawn between previously permitted FV processes and the proposed DPV application, impacts relating to pollutant and odour releases are considered **not significant**.

Impacts relating to road traffic exhaust emissions associated increased deliveries and export may also lead to impacts on the surrounding environment. An assessment was therefore undertaken using the EPUK and IAQM screening criteria to determine the potential for vehicle trips generated by the Proposed Development to affect local air quality. This indicated that minimal increases to HGVs will not exceed relevant assessment thresholds. Based on this information associated impacts are likely to be **not significant** throughout the operational phase.

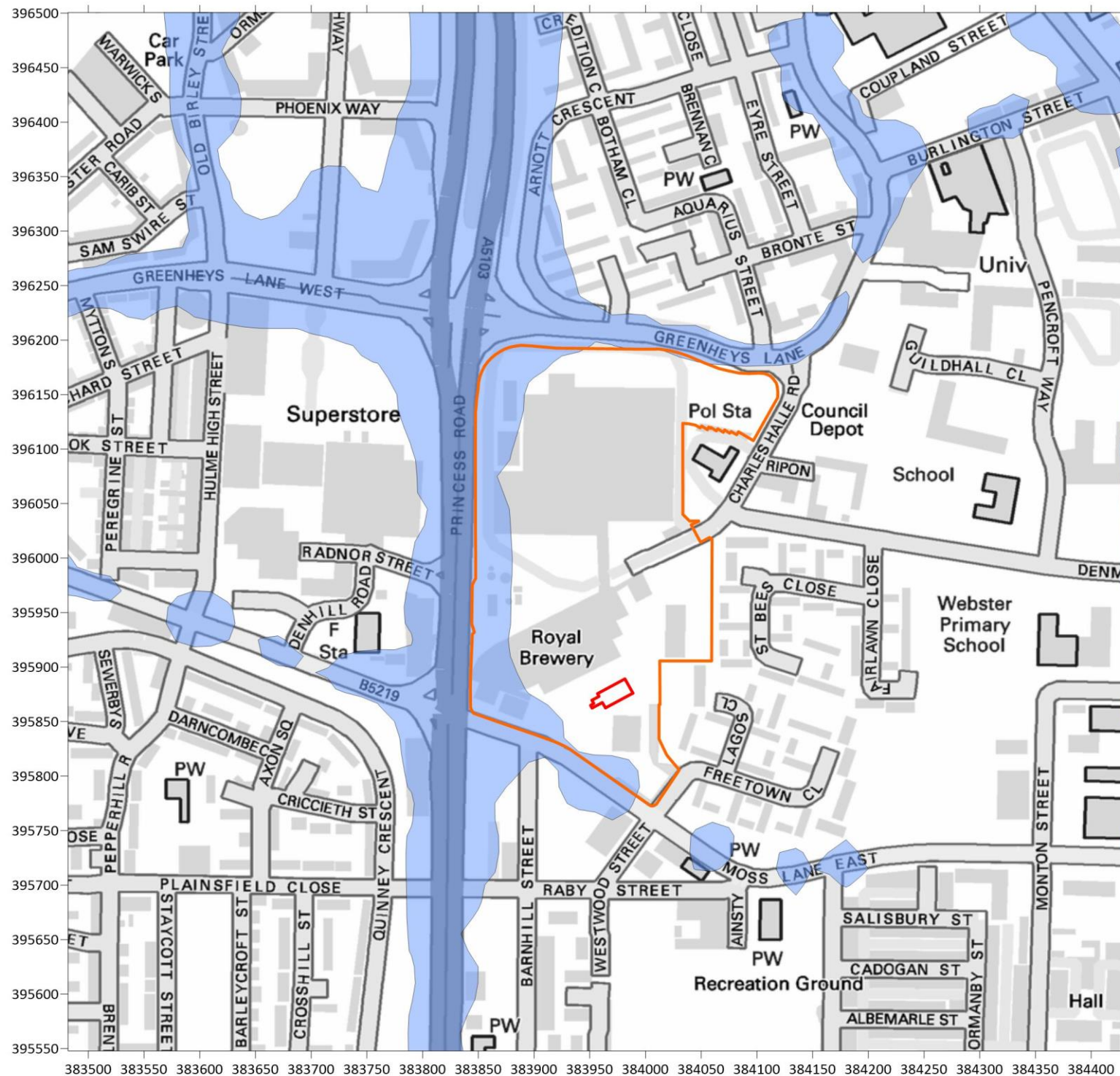
Based on the assessment air quality and odour emission impact are not considered a constraint to planning consent and the Proposed Development is considered suitable for proposed end use.

2.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
CO ₂	Carbon Dioxide
DEFRA	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
DPV	Dual Purpose (fermentation) Vessels
EPUK	Environmental Protection UK
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
MCC	Manchester City Council
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
PPC	Pollution, Prevention & Control

END OF REPORT

APPENDIX I - FIGURES



Legend

-  DPV Block Planning Boundary
-  Heinen UK Site Boundary
-  Air Quality Management Area

Title
Figure 1
Site Location and Surrounding Context

Project
Heinen UK Limited, Denmark Road,
Manchester

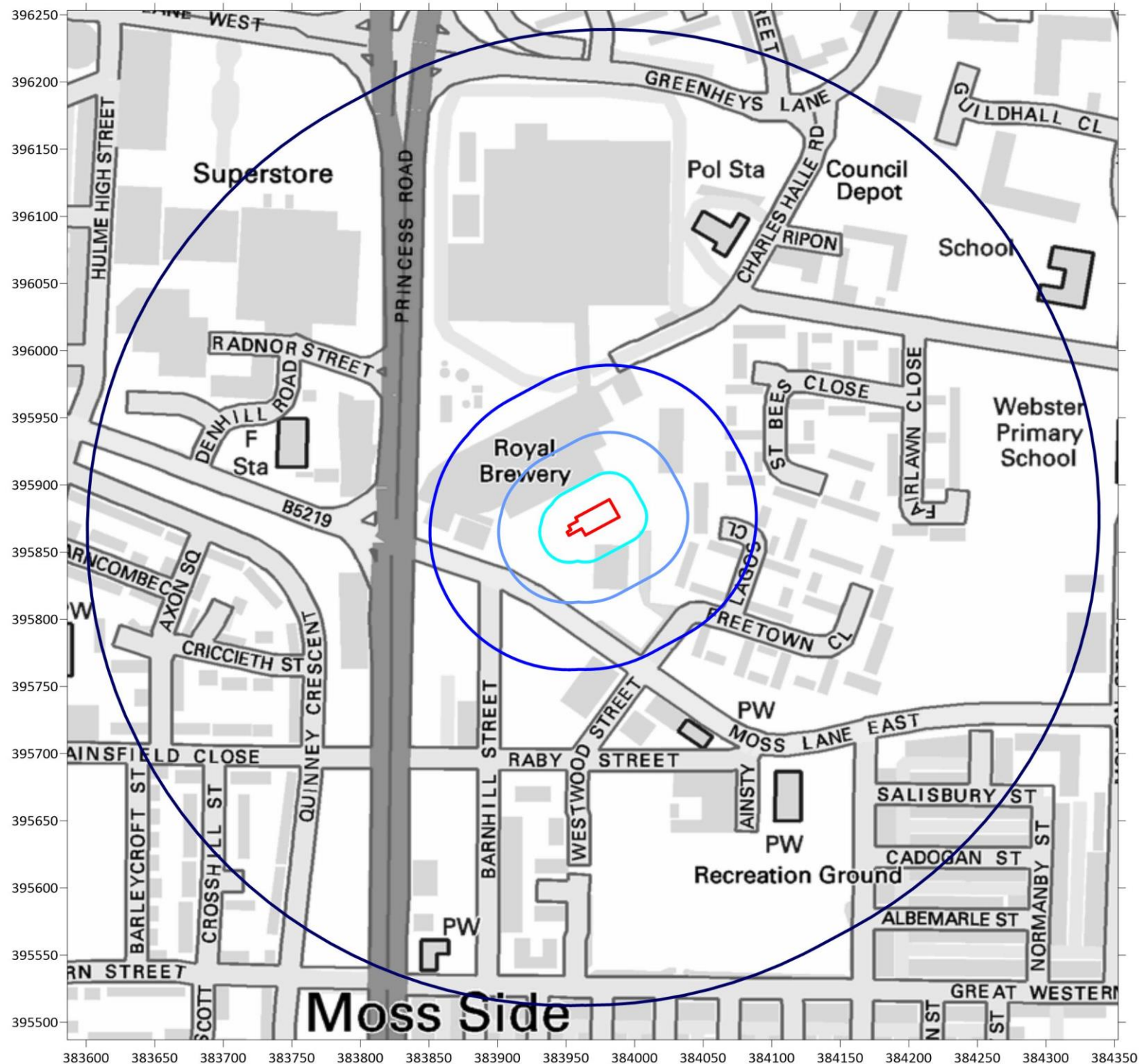
Proposed DPV Block

Project Number
AQ109510

Client
Heinen UK Limited

Contains Ordnance Survey Data
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- Legend**
- DPV Block Planning Boundary
 - 20m from Site Boundary
 - 50m from Site Boundary
 - 100m from Site Boundary
 - 350m from Site Boundary

Title
Figure 2
Demolition, Earthworks and Construction
Dust Buffer Zones

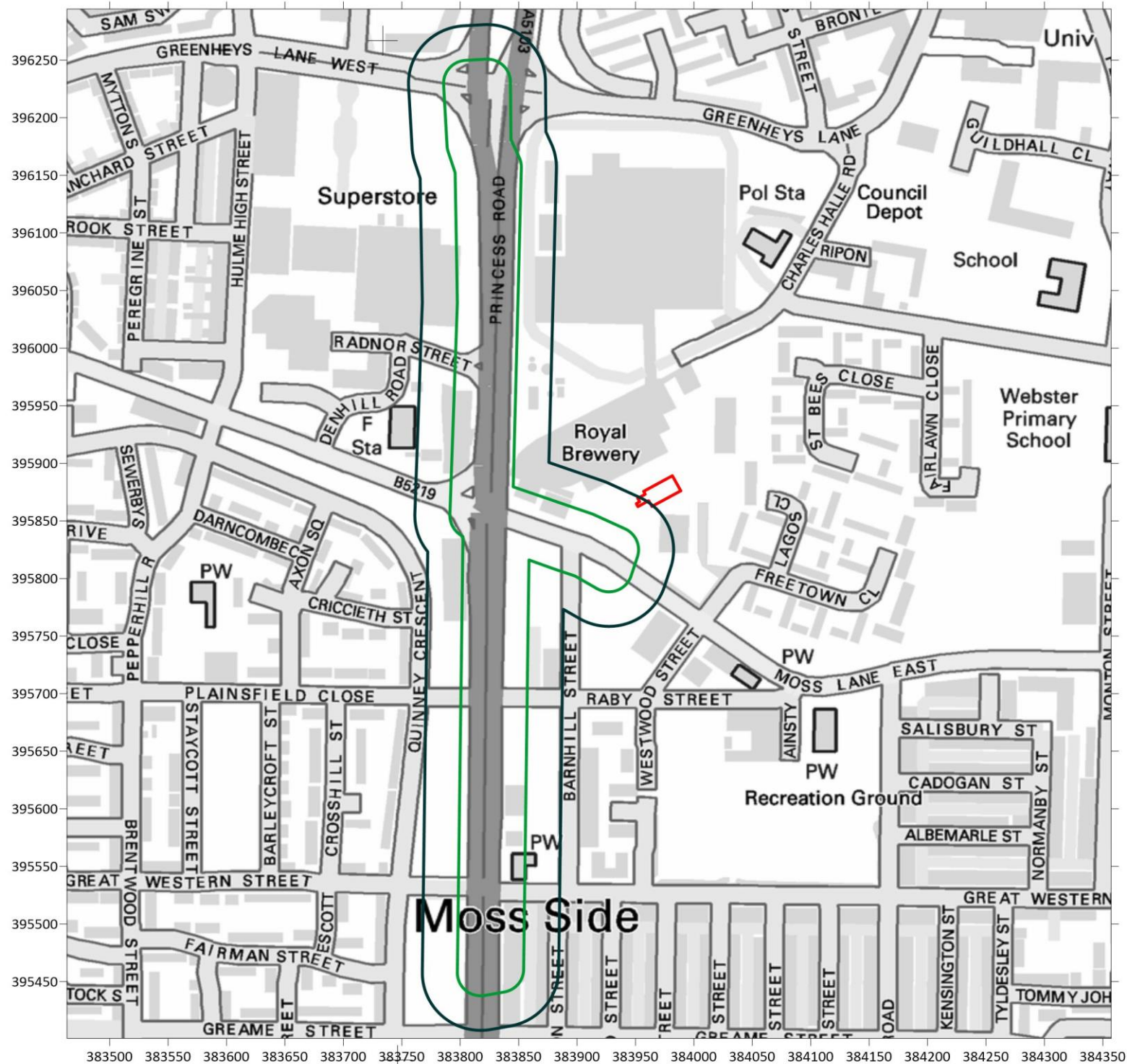
Project
Heineken UK Limited, Denmark Road,
Manchester

Proposed DPV Block

Project Number
AQ109510

Client
Heineken UK Limited

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Legend

-  DPV Block Planning Boundary
-  20m from Site Access Route
-  50m from Site Access Route

Title

Figure 3
Trackout Dust Buffer Zones

Project

Heineken UK Limited, Denmark Road,
Manchester

Proposed DPV Block

Project Number

AQ109510

Client

Heineken UK Limited

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APPENDIX II – CONSTRUCTION PHASE ASSESSMENT CRITERIA

CONSTRUCTION PHASE METHODOLOGY

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction'¹.

Activities on the proposed construction site have been divided into four types to reflect their different potential impacts. These are:

- Demolition
- Earthworks;
- Construction; and
- Trackout.

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to PM₁₀ and PM_{2.5}.

The assessment steps are detailed below.

Step 1

Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the site boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should proceed to Step 2. Additionally, should ecological receptors be identified within 50m of the boundary site or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should also proceed to Step 2.

Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

Step 2

Step 2 assesses the risk of potential dust impacts. A site is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table AIII.1.

Table AIII.1: Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	• Total building volume greater than 50,000m³ • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities greater than 20m above ground level

*** INSERT PROJECT REFERENCE***

Magnitude	Activity	Criteria
	Earthworks	- Total site area greater than 10,000m² - Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) - More than 10 heavy earth moving vehicles active at any one time - Formation of bunds greater than 8m in height - More than 100,000 tonnes of material moved
	Construction	- Total building volume greater than 100,000m³ - On site concrete batching - Sandblasting
	Trackout	- More than 50 Heavy Duty Vehicle (HDV) trips per day - Potentially dusty surface material (e.g. high clay content) - Unpaved road length greater than 100m
Medium	Demolition	- Total building volume 20,000m³ to 50,000m³ - Potentially dusty construction material - Demolition activities 10m to 20m above ground level
	Earthworks	- Total site area 2,500m² to 10,000m² - Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time - Formation of bunds 4m to 8m in height - Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	- Total building volume 25,000m³ to 100,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching
	Trackout	10 to 50 HDV trips per day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50m to 100m
Small	Demolition	- Total building volume under 20,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber) - Demolition activities less than 10m above ground level - Demolition during wetter months
	Earthworks	- Total site area less than 2,500m² - Soil type with large grain size (e.g. sand) - Less than 5 heavy earth moving vehicles active at any one time - Formation of bunds less than 4m in height - Total material moved less than 20,000 tonnes - Earthworks during wetter months
	Construction	- Total building volume less than 25,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber)

Step 2B defines the sensitivity of the area around the development site for construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table AIII.2.

Table AIII.2: Examples of Factors Defining Sensitivity of an Area

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	- Users expect of high levels of amenity - High aesthetic or value property - People expected to be present continuously for extended periods of time - Locations where members of the public are exposed over a time period relevant to the AQO for PM₁₀ e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation
Medium	- Users would expect to enjoy a reasonable level of amenity - Aesthetics or value of their property could be diminished by soiling - 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 e.g. parks and places of work	Nationally designated site e.g. Sites of Special Scientific Interest
Low	- Enjoyment of amenity would not reasonably be expected - Property would not be expected to be diminished in appearance - Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads	Locally designated site e.g. Local Nature Reserve

The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts during the construction phase:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and the receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
 - Any conclusions drawn from local topography;
 - Duration of the potential impact, as a receptor may become more sensitive over time; and
 - Any known specific receptor sensitivities which go beyond the classifications given in the document.

These factors were considered in the undertaking of this assessment.

The sensitivity of the area to dust soiling effects on people and property is shown in Table AIII.3.

Table AIII.3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low

*** INSERT PROJECT REFERENCE***

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

Table AIII.4 outlines the sensitivity of the area to human health impacts.

Table AIII.4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	More than 1	Low	Low	Low	Low	Low

Table AIII.5 outlines the sensitivity of the area to ecological impacts.

Table AIII.5: Sensitivity of the Area to Ecological Impacts

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

Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

Table AIII.6: Dust Risk Category from Demolition

Receptor Sensitivity	Distance from the Source (m)		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Medium	Low	Negligible

Table AIII.7 outlines the risk category from earthworks and construction activities.

Table AIII.7: Dust Risk Category from Earthworks and Construction

Receptor Sensitivity	Distance from the Source (m)		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table AIII.8 outlines the risk category from trackout.

Table AIII.8: Dust Risk Category from Trackout

Receptor Sensitivity	Distance from the Source (m)		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with negligible risk mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

APPENDIX III – ASSESSOR'S CURRICULUM VITAE

JOSHUA DAVIES

Senior Air Quality Consultant

BSc (Hons) AMIEnvSci

KEY EXPERIENCE

Josh is an Environmental Consultant with specialist experience in the air quality sector. His key capabilities include:

- Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors.
- Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
- Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- Assessment of Odour Impact from commercial and industrial processes in line with Environment Agency (EA) and IAQM methodologies and guidance
- Quantification of Ecological Impacts associated with Nitrogen and Acid Deposition from industrial processes
- Production of air quality mitigation strategies for developments throughout the UK.
- Management of Environmental Permit Applications primarily for the Medium Combustion Plant Directive (MCDP)

SELECT PROJECTS SUMMARY

- Back Lane, Congleton - for a residential development of 140 dwellings.
- Imperial War Museum, Duxford – Air Quality screening assessment associated with dust and odour as a result of proposed restoration activities
- London South Bank University -AQA for redevelopment of the campus, with associated energy centre
- Scunthorpe United Football Stadium - AQA for new sports stadium and commercial and retail park
- Heineken UK, Manchester – Production of various AQAs for the expansion of the Manchester Brewery site.
- Cricklewood Freight Terminal – AQA for an aggregate freight terminal in Brent. Dust and HGV impact assessment and mitigation strategy
- Llay Wrexham – AQ associated with a Short-Term Reserve Operation site in line with the Medium Combustion Plant Directive (MCPD)

ES Chapters

- Great Jackson Street Framework - Production of a number of ES chapters for large-scale mixed use multi storey buildings
- Keele University – Road and Energy Assessment for the proposed re-development of the student campus
- Newton Farm, Perth - EIA for a medium scale residential development in close vicinity to the A9.

Odour Assessments

- Clipsone House Farm – Quantitative odour and ammonia assessment in support of a proposed extension to a large-scale poultry farm.
- Chatteris AD Plant - Quantitative odour modelling and sniff tests to discharge condition on an existing anaerobic digestion plant
- Jennychem, Snodland - Risk Assessment and Best Practice Statement in support of the proposed car repairs facility spray booth

London Borough of Southwark Experience

- Camberwell Road, Southwark - Exposure assessment for a proposed gym within an AQMA, 24 hour and 1 hour mean AQOs assessed.
- Pelier Street- AQA for a residential development located within the Southwark AQMA
- Haddonfield Estate - AQA for a residential development located within the Southwark AQMA
- Lavington Street - AQA for mixed use scheme in AQMA in Southwark, including an AQN assessment.
- Daniels Road - AQA for a residential development within the Southwark AQMA

Educational Developments

- Brinsworth Comprehensive School, Rotherham - Baseline and Construction phase assessment for the proposed extension and new Sports Hall. Site suitability due to the Schools close proximity to the M1 Motorway.
- Ashton House, Waterloo Street, Bolton – Exposure and impact assessment related to a proposed expansion of the existing site located within the Greater Manchester AQMA
- St Marys and Johns CE School, Barnet AQA for the refurbishment of the existing school and the construction of a 3-storey classroom block, within the borough wide Barnet AQMA.
- St Peters Catholic School, Guildford - AQA for the redevelopment of the existing site, and the construction of a two-storey classroom block.

Monitoring & Surveying Experience

- Co-ordination and management of NO₂ diffusion tube monitoring surveys in accordance with DEFRA guidance.
- Odour Acuity certified, undertaken numerous site sniff tests

QUALIFICATIONS

- Bachelor of Science
- Member of the Institute of Environmental Science (IES)

- Odour Acuity Certified Master of Science
- Member of the Institute of Air Quality Management
- Member of the Institute of Environmental Science