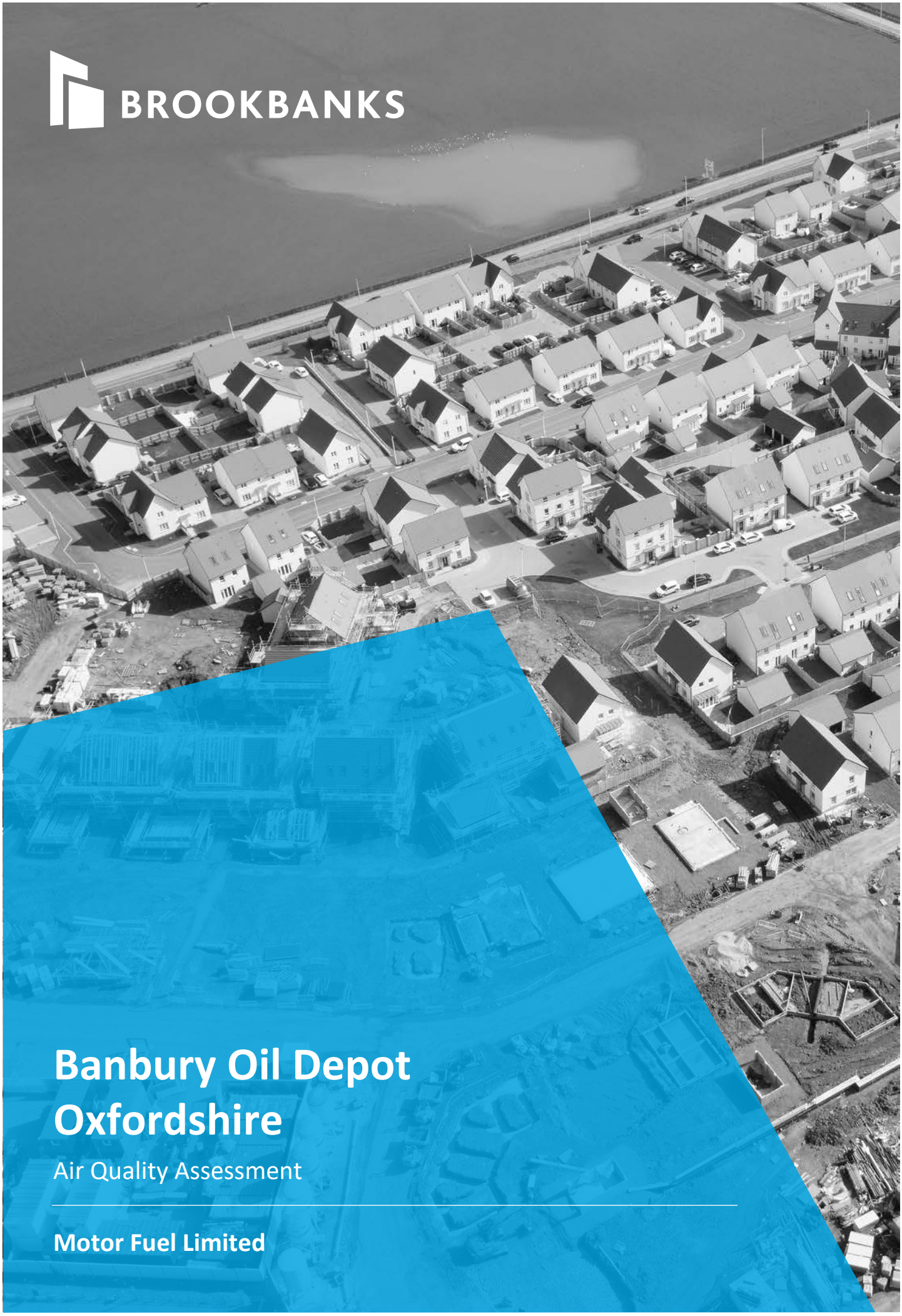
BROOKBANKS



Banbury Oil Depot
Oxfordshire

Air Quality Assessment

Motor Fuel Limited

Document Control Sheet

Document Title Air Quality Assessment

Document Ref 10682/01

Project Name Banbury Oil Depot

Project Number 10682

Client Motor Fuel Limited

Document Status

Rev	Issue Status	Prepared / Date	Checked / Date	Approved / Date
0	Draft	S Irons	A Eggleston	J Kerry
1	Draft	S Irons 26.01.2022	J Kerry 27.01.2022	J Kerry 28.01.2022

Issue Record

Name / Date & Revision	16.03.2021	28.01.2022				
D Jones – Framptons Planning for Motor Fuel Limited	0	1				

Contents

Figures

Tables

Appendices

1 Introduction

1.1 Brookbanks has been appointed by Motor Fuel Limited to undertake an air quality assessment of potential impacts for the Proposed Development at Banbury Oil Depot in Oxfordshire.

1.2 The Proposed Development is a brownfield site located within Banbury City Centre. It is bound to the north and south by existing employment land, to the east by Banbury train station and the River Cherwell to the west. The Site location is presented in **Figure 1-1**.

1.3 The outline planning application for the redevelopment of the Banbury Oil Depot, includes the demolition/removal of buildings and other structures associated with the oil depot use and the construction of a mixed use development, with all matters (relating to appearance, landscaping, scale, and layout) reserved except for access off Tramway Road. The new development will comprise up to 110 residential apartments, and up to 166m² of community/retail/commercial space.

1.4 The scheme has the potential to introduce the following air quality impacts:

- Suspended and re suspended fugitive dust emissions from demolition / construction activities.
- Emissions from construction traffic, including re-suspended dust from HGV movements.
- Emissions from operational traffic.

1.5 This report presents the findings of a detailed air quality assessment of the potential impacts of the Proposed Development on local air quality during both construction and operational phases. For both phases, the type, source and significance of potential impacts are identified and the measures that should be employed to minimise these impacts are described.

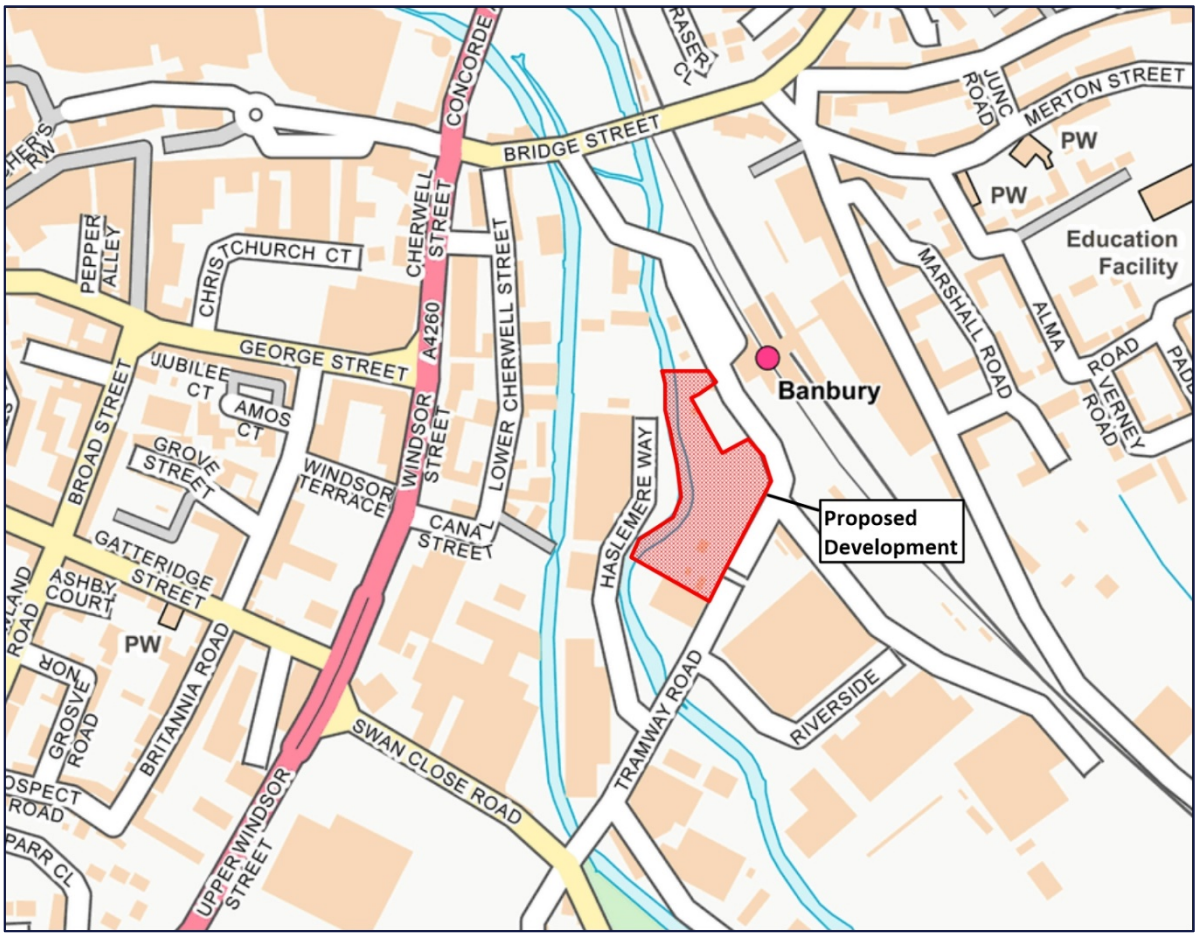


Figure 1-1: Site Location Contains Ordnance Survey data © Crown copyright and database right 2021.

2 Policy Context

Air Quality Strategy for England, Scotland, Wales & Northern Ireland

2.1 The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (AQS) published in July 2007[1], pursuant to the requirements of Part IV of the Environment Act 1995. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. The AQS is designed to be an evolving process that is monitored and regularly reviewed.

2.2 The AQS sets standards and objectives for ten main air pollutants to protect health, vegetation and ecosystems. These are benzene (C_6H_6), 1,3-butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10}, $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3) and polycyclic aromatic hydrocarbons (PAHs).

2.3 The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on medical and scientific evidence reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). These are general concentration limits, above which sensitive members of the public (e.g., children, the elderly and the unwell) might experience adverse health effects.

2.4 The air quality objectives are medium-term policy based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e., a limited number of permitted exceedances of the standard over a given period.

2.5 For some pollutants there is both a long-term (annual mean) standard and a short-term standard. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for fine particulates (PM_{10}) it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants (e.g., temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road).

2.6 Of the pollutants included in the AQS, NO_2, PM_{10} and $PM_{2.5}$ are particularly relevant to the assessment, since these are the primary pollutants associated with road traffic. A summary of the air quality objectives for these pollutants is presented in **Table 2-1**.

Pollutant	Standard (µg/m^3)	Averaging Period	Number of Permitted Exceedances per Annum
NO_2	40	Annual	-
	200	1-Hour	18
PM_{10}	40	Annual	-
	50	24-Hour	35
$PM_{2.5}$	25	Annual	-

Table 2-1: Air Quality Strategy Objectives for NO_2, PM_{10} and $PM_{2.5}$

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (July 2007)

National Planning Policy Framework (NPPF)

2.7 The National Planning Policy Framework (NPPF)[2] sets out the Government's policies for planning and how these should be applied. With regard to air quality, the NPPF 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".

2.8 The NPPF outlines the role of Local Plans in promoting sustainability and providing limitations on development in areas of poor air quality. An emphasis is placed on consultation with the planning authority to determine whether there are any local issues with the potential to affect the scope of an air quality assessment. Typical air quality mitigation measures are outlined, highlighting the use of planning conditions and funding obligations to off-set any significant impacts.

Control of Dust and Particulates Associated with Construction

2.9 Section 79 of the Environmental Protection Act (1990) states that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Statutory nuisance is defined as:

"Any dust or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance and 'any accumulation or deposit which is prejudicial to health or a nuisance".

2.10 Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

2.11 In the context of the proposed development, the main potential for nuisance of this nature will arise during the construction phase – potential sources being the clearance, earthworks, construction and landscaping processes.

2.12 There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist – 'nuisance' is a subjective concept, and its perception is highly dependent upon the existing conditions and the change which has occurred. However, research has been undertaken by a number of parties to determine community responses to such impacts and correlate these to dust deposition rates.

Cherwell Local Plan 2011 – 2031

2.13 The Cherwell Local Plan[3] sets out the strategic policies for future development in the District. With regard to air quality, Policy ESD10 'Protection and Enhancement of Biodiversity and the Natural Environment' states that "*Air quality assessments will [also] be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution*."

2.14 In addition, Policy ESD15 'The Character of the Built and Historic Environment' states that "*New development proposals should Integrate and enhance green infrastructure and incorporate biodiversity enhancement features where possible. Well-designed landscape schemes should be an integral part of development proposals to support improvements to biodiversity, the microclimate, and air pollution and provide attractive places that improve people's health and sense of vitality*".

[2] National Planning Policy Framework, Department for Communities and Local Government, February 2019
[3] Cherwell Local Plan 2011 -2031, Part 1 Adopted 20 July 2015 (incorporating Policy Bicester 13 re-adopted on 19 December 2016)

2.15 The Local Plan also retains Policy ENV1 of the Adopted Local Plan 1996[4], which states that "*development which is likely to cause materially detrimental levels of noise, vibration, smell, smoke, fumes or other type of environmental pollution will not normally be permitted*". Furthermore "*the Council will seek to ensure that the amenities of the environment, and in particular the amenities of residential properties, are not unduly affected by development proposals which may cause environmental pollution, including that caused by traffic generation*".

Cherwell District Council Air Quality Action Plan

2.16 Local Authorities are required to regularly review and assess air quality to establish whether there are any locations where pollutant concentrations exceed the relevant air quality objectives or EU limit values. Where an exceedance is identified the local authority is obliged to declare an Air Quality Management Area (AQMA) and prepare an Action Plan setting out measures to improve air quality and achieve compliance with the objective(s).

2.17 To date, Cherwell District Council (CDC) have declared four AQMAs due to measured exceedances of the air quality objectives for NO_2. Two of the AQMAs are in Banbury; one encompasses Hennef Way, between Ermont Way and Concorde Avenue (AQMA 1) and the other is along the A361 between Bloxham Road and Castle Street (AQMA 2). The proposed development is located approximately 1.3km south of AQMA 1 and 600m east of AQMA 2. The extent of the designated areas is shown in **Figure 2-1.**

Figure 2-1: Banbury Air Quality Management Areas

2.18 CDC's Air Quality Action Plan[5] (AQAP) sets out measures to improve air quality under five broad topics:

- Policy guidance and development control;

[4] Cherwell Local Plan, Adopted November 1996
[5] Cherwell District Council Air Quality Action Plan 2017, March 2017

- Promoting low emission transport;
- Promoting travel alternatives to private vehicle use;
- Transport planning and infrastructure; and
- Public information.

2.19 The effectiveness of the AQAP is evaluated by the Council's ongoing monitoring programme and reported to Defra via the Annual Air Quality Status Report (ASR).

3 Methodology

Construction Dust

3.1 The potential impact of dust generated during site enabling, earthworks and construction works at the proposed development has been undertaken in accordance with the Institute of Air Quality Management (IAQM) construction dust guidance[6] . A full description of the assessment methodology is provided in Appendix A.

3.2 A detailed assessment of dust impacts is required where there are human receptors within:

- 350m of the site boundary; or
- 50m of the route(s) used by construction vehicles on public roads, up to 500m from the site entrance(s).

3.3 For ecological impacts, a detailed assessment is required if there are dust sensitive habitat sites within

- 50m of the site boundary; or
- 50m of the route(s) used by construction vehicles on public roads, up to 500m from the site entrance(s).

3.4 The IAQM methodology allows the potential risk of dust soiling and human health effects to be determined, based primarily on the sensitivity of nearby receptors and the anticipated magnitude of the dust emission due to:

- Demolition;
- Earthworks;
- Construction; and
- Track-out (re-suspended dust from vehicle movements).

3.5 The assessment of dust risk is also based on professional judgement taking into account factors such as the prevailing wind direction, the proposed construction phasing, the likely duration of dust raising activities, local topography and existing air quality.

3.6 A range of best practice mitigation measures are provided within the guidance, which are dependent on the level of dust risk attributed to the site. It is recommended that these measures are incorporated into a Dust Management Plan (DMP) for the proposed development.

3.7 The significance of the residual impacts following appropriate mitigation is determined by professional judgement.

Construction Traffic

Screening Assessment

3.8 Construction traffic will temporarily increase traffic levels on the surrounding road network. The greatest potential for effects on air quality from traffic associated with this phase of the Proposed Development will be in the areas immediately adjacent to the principal means of access for construction traffic.

[6] Guidance on the assessment of dust from demolition and construction, IAQM, v1.1, June 2016

3.9 The Environmental Protection UK (EPUK) and IAQM air quality planning guidance[7] sets out criteria to assist in establishing when an air quality assessment will be required. Within or adjacent to an AQMA, a detailed assessment of traffic-related impacts is required where:

- There is a change in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 100 vehicles; and/or
- There is a change in the AADT flow of heavy goods vehicles (HGV) of more than 25 vehicles; and/or
- There is a change in the road re-alignment by more than 5m; and/or
- A new junction is introduced, which will significantly alter vehicle speeds.

3.10 Elsewhere, a detailed assessment of impacts is required where:

- There is a change in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 500 vehicles; and/or
- There is a change in the AADT flow of heavy goods vehicles (HGV) of more than 100 vehicles; and/or
- There is a change in the road re-alignment by more than 5m; and/or
- A new junction is introduced, which will significantly alter vehicle speeds.

3.11 In the context of these screening criteria, LGV and HGV refer to vehicles below and above 3.5 tonnes, respectively.

3.12 The Proposed Development is not within an AQMA and is expected to generate 16 - 20 additional HGV movements per day, during the construction phase. The impact of the on local air quality is therefore expected to be negligible.

Operational Traffic

Screening Assessment

3.13 The proposed development will generate 282 additional LGV vehicle movements per day (AADT). The distribution of the operational traffic over the local road network is presented in **Table 3-1**.

[7] Land-use Planning and Development Control: Planning for Air Quality, Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land use planning and development control process, January 2017.

Road Link	AADT	Threshold for a Detailed Assessment of Air Quality Impacts
Tramway Road	282	500
Swan Close Road (SE of Tramway Road)	78	500
Swan Close Road (NW of Tramway Road)	204	500
A4260 Cherwell Street / Concorde Avenue	188	500
A4260 Upper Windsor Street	16	500
A422 Hennef Way (E of A4260)	98	100
A422 Hennef Way (W of A4260)	90	500

Table 3-1: Annual Average Daily Operational Traffic

3.14 In accordance with the screening criteria, the development traffic is unlikely to significantly affect local air quality and a detailed assessment of impacts is not required.

4 Baseline Conditions

Local Air Quality Monitoring

4.1 CDC do not currently undertake automatic monitoring of NO_2, PM_{10} or $PM_{2.5}$ in the District, however annual mean NO_2 concentrations are measured via an extensive network of passive diffusion tubes.

4.2 A summary of monitoring locations in Banbury is presented in **Table 4-1** and the location of the monitoring sites is shown in **Figure 4-1**.

ID	Location	Type	Easting	Northing
1	Middleton Road	Kerbside	446250	240716
2	Bridge Street	Kerbside	445961	240595
3	Bankside	Roadside	446377	239620
4	High Street	Kerbside	445407	240421
5	North Bar	Kerbside	445352	240774
6	Cherwell Street 2014	Roadside	445932	240499
7	Warwick Road North	Roadside	443905	241392
8	Ruscote Avenue	Roadside	444611	241172
9	Oxford Rd/ South Bar	Kerbside	445333	240100
10	Horsefair (x3)	Roadside	445351	240578
11	Sinclair Avenue	Urban Background	444274	241289
12	Cranleigh Close	Urban Background	444366	239654
13	Hennef Way	Roadside	446535	241721
14	Stroud Close	Roadside	446334	241676
15	Ermont Way 1	Roadside	446828	241591
16	Ermont Way 2	Roadside	446997	241315

Table 4-1: Diffusion Tube Monitoring Sites in Banbury

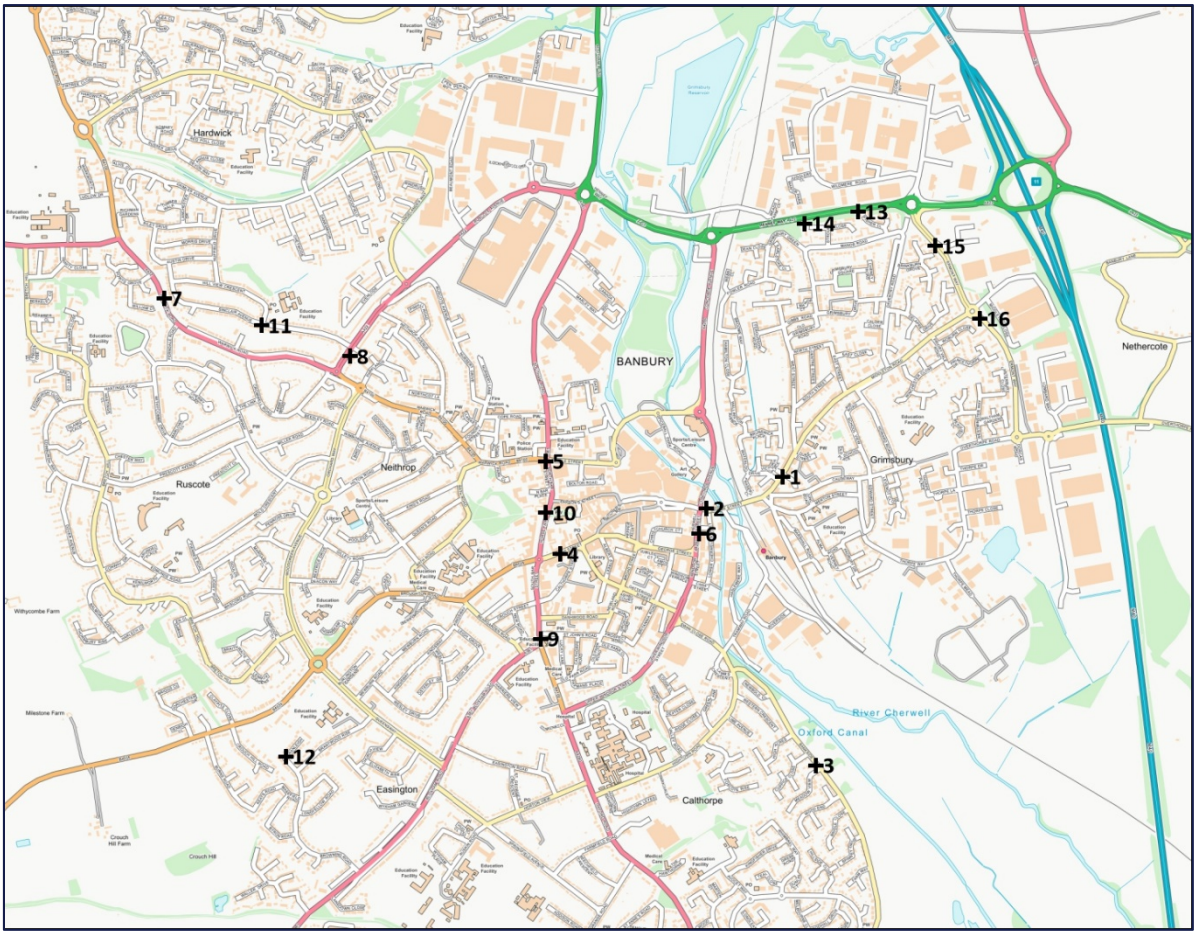


Figure 4-1: Location of Diffusion Tube Monitoring Sites

Contains Ordnance Survey data © Crown copyright and database right 2021.

4.3 A summary of annual mean NO_2 concentrations measured between 2015 and 2019 is presented in **Table 4-2**.

4.4 Exceedances of the annual mean air quality objective of 40 µg/m^3 are highlighted in bold. The data indicate that concentrations are close to or exceed the air quality objective on Horsefair (within AQMA 2). Likewise, a substantial exceedance of the air quality objective persists within the Hennef Way AQMA.

4.5 Research[8] has shown that exceedances of the short-term objective for NO_2 are also likely where the annual mean concentrations are above 60 µg/m^3, such as within the Hennef Way AQMA.

[8] D. Laxen and B Marner (2003) Analysis of the relationship between 1-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites.

ID	Type	2015	2016	2017	2018	2019
1	Kerbside	32.1	32.7	31.1	28.0	30.0
2	Kerbside	33.6	33.0	33.1	32.0	32.3
3	Roadside	16.3	17.9	17.0	18.8	17.2
4	Kerbside	35.3	34.6	35.0	32.3	34.6
5	Kerbside	38.9	36.5	36.9	34.5	34.0
6	Roadside	35.3	37.7	37.3	36.4	29.9
7	Roadside	23.1	26.1	23.3	21.9	20.3
8	Roadside	21.9	23.6	20.1	20.6	18.9
9	Kerbside	33.2	35.5	33.4	36.1	35.3
10	Roadside	**40.9**	38.8	**41.8**	38.7	38.6
11	Urban Background	14.5	16.8	14.4	14.3	14.4
12	Urban Background	10.9	12.5	10.7	12.3	11.0
13	Roadside	**84.9**	**89.9**	**91.6**	**81.2**	**77.5**
14	Roadside	28.7	28.1	24.9	25.7	23.5
15	Roadside	28.4	31.0	28.5	30.9	28.0
16	Roadside	29.3	31.4	27.2	29.7	27.1

Table 4-2: Annual Mean NO_2 Concentrations Measured in Banbury (µg/m³)

4.6 There are two urban background monitoring sites in Banbury. The maximum concentration measured at these locations between 2015 and 2019 was 16.8 µg/m³.

4.7 The data from both the roadside and background locations shows no clear trend, indicating that NO_2 concentrations in Banbury are currently relatively stable.

DEFRA Mapped Background Concentrations

4.8 In the absence of local a local particulate monitoring site and for comparison with the measured background NO_2 data, annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations have been obtained from the DEFRA background pollutant maps[9].

4.9 These 1km grid resolution maps are derived from a complex modelling exercise that takes into account emissions inventories and measurements of ambient air pollution from both automated and non-automated sites. The latest background maps were issued in August 2020 and are based on 2018 monitoring data.

4.10 A summary of the 2019 and 2025 (opening year) maximum annual mean mapped background concentrations in Banbury is presented in **Table 4-3**. The maximum concentrations have been identified from contour plots of the mapped data.

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

Pollutant	2019 Annual Mean (µg/m^3)	2025 Annual Mean (µg/m^3)	Air Quality Objective (µg/m^3)
NO_2	17.2	14.5	40
PM_{10}	19.1	17.8	40
$PM_{2.5}$	13.6	12.5	25

Table 4-3: Mapped Background Concentrations

4.11 The mapped NO_2 concentrations are in good agreement with maximum background concentration measured in Banbury between 2015 and 2019 and therefore the mapped concentrations are considered to be reasonably representative of background concentrations in the area.

Existing and Future Air Quality at the Proposed Development

4.1 The nearest monitoring sites to the Proposed Development are on Middleton Street (tube 1), Bridge Street (tube 2) and Cherwell Street (tube 7). Annual mean concentrations measured at all three locations are below the annual mean air quality objective. These tubes are located close to moderately busy roads (AADT flows of 10,000 to 20,000 vehicles) where emissions from traffic sources would be expected to be significant.

4.2 Tramway Road, which is adjacent to the Proposed Development, is a very minor road by comparison, with an AADT flow of less than 2,000 vehicles. Concentrations of NO_2 adjacent to Tramway Road and at the Proposed Development site, would therefore be expected to be well within the long and short-term air quality objectives.

4.3 The proposed residential dwellings will be approximately 45m from Banbury Station, however the Chiltern Mainline has not been identified by LAQM.TG16 as having a large number of diesel passenger trains, which are primarily responsible for poor air quality. On this basis, the close proximity of the railway is unlikely to significantly affect pollutant concentrations at the site.

4.4 Pollutant concentrations in Banbury have been relatively stable over the last five years and these taking into account the increasingly stringent vehicle emission standards for new cars and the uptake of electric vehicles, it is considered unlikely that future NO_2, PM_{10} or $PM_{2.5}$ concentrations will significantly exceed current levels. The proposed development will not, therefore, introduce new exposure to poor air quality.

5 Predicted Impact

Construction Dust

5.1 Sensitive receptors that may be affected by dust emissions during construction activities include residential properties, educational facilities, retail premises, places of work, recreational areas and ecological receptors.

5.2 The sensitivity of the area to dust soiling impacts is dependent on the proximity of the most sensitive receptors to the site boundary.

5.3 A summary of the receptor and area sensitivity to health and dust soiling impacts is presented in **Table 5-1**.

5.4 There are no dust sensitive habitat sites within 50m of the Site; therefore, ecological impacts have not been considered in the assessment.

5.5 The sensitivity of the area to impacts on human health impacts is also based on the proximity of the most sensitive receptors, but it also dependant on existing particulate concentrations in the area.

5.6 The higher the existing PM_{10} concentration the more likely health impacts will occur at receptor locations. Based on the mapped background concentrations in Banbury, it is assumed that the existing PM_{10} concentrations in the area are below 24 µg/m^3.

5.7 Due to the small number of residential receptors close to the site and the existing PM_{10} concentrations that are well below the air quality objective, the area surrounding the Proposed Development is considered to be of 'low' sensitivity to health impacts and 'medium' sensitivity to dust soiling impacts.

Receptor	Distance from Site Boundary	Number of Receptors	Sensitivity to Human Health Impacts		Sensitivity to Dust Soiling Impacts	
			Receptor	Area	Receptor	Area
Residential Properties (including caravan park)	<20m	1 - 10	High	Low	High	Medium
	<50m	10 - 100		Low		Medium
	<100m	10 - 100		Low		Low
Commercial/ Industrial Units	<20m	1 - 10	Medium	Low	Medium	Medium
	<50m	10 - 100		Low		Low
	<100m	>100		Low		Low
Banbury Station	<20m	10 - 100	Medium	Low	Medium	Medium
	<50m	>100		Low		Low

Table 5-1: Receptor and Area Sensitivity to Dust Impacts

5.8 The precise behaviour of the dust, its residence time in the atmosphere, and the distance it may travel before being deposited would depend upon a number of factors.

5.9 These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

5.10 A wind rose from Brize Norton (2018) is provided below in **Figure 5-1**, which shows that the prevailing wind is from a west and south-westerly direction. Receptors located to the north-east are therefore most likely to experience significant impacts as a result of dust generated during the construction process.

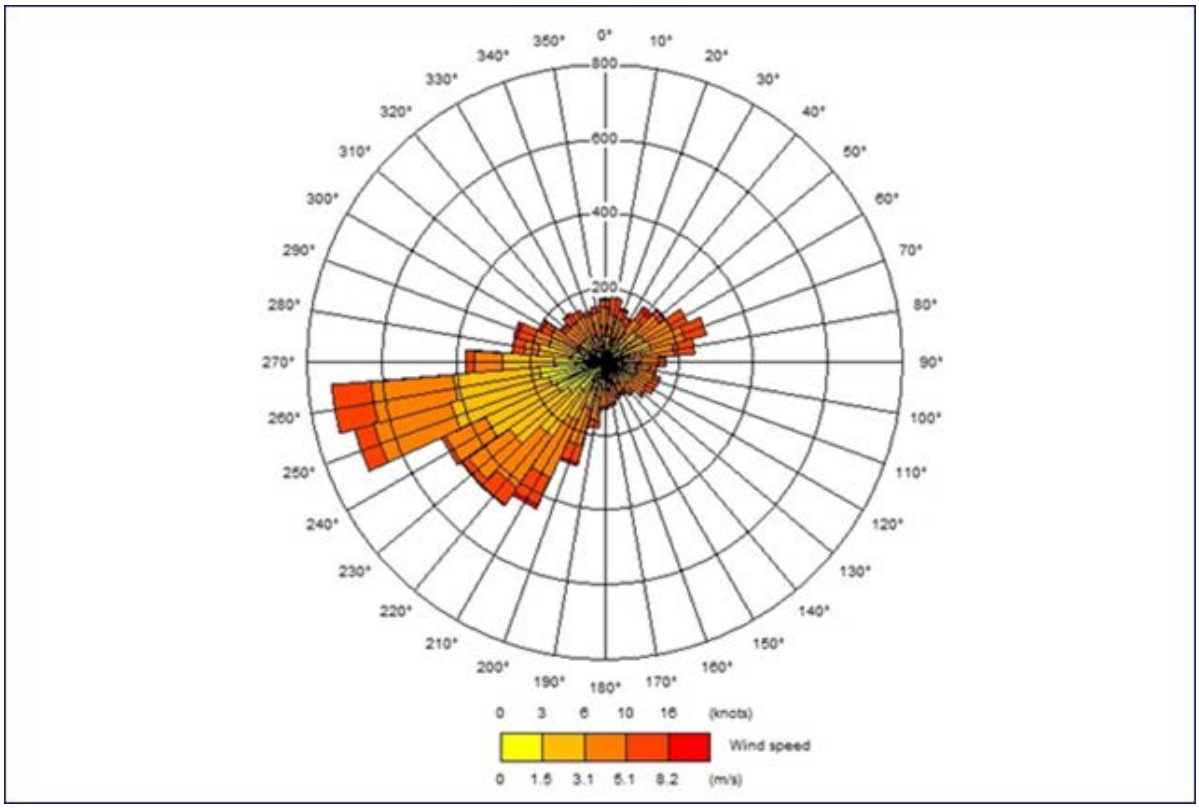


Figure 5-1: Brize Norton Wind Rose

5.11 The magnitude of the likely dust emission from demolition, earthworks, construction and trackout, has been evaluated using the criteria in Table A5 of **Appendix A** and is presented in **Table 5-2**.

Dust Source	IAQM Criteria	Proposed Development	Dust Emission Magnitude
Demolition	Total building volume	1,398 m^3	Small
	Potentially dusty material?	Brick, concrete	Medium
	On-site crushing and screening?	Unknown, assumed no based-on scale of works	Medium
	Maximum height of demolition activities above ground-level	<12 m	Medium
	Demolition during wetter months?	Cannot be guaranteed	Medium
Dust Emission Magnitude from Demolition			**Medium**
Earthworks	Total site area	>10,000 m^2	Large
	Soil type?	Unknown, assumed moderately dusty	Medium
	Number of heavy earth moving vehicles active at any one time	Unknown, assumed 5-10	Medium
	Maximum bund height	Unknown, assumed 4 - 8 m	Medium
	Total material moved	Unknown, assumed <100,000 tonnes	Medium
	Earthworks during wetter months?	Cannot be guaranteed	Medium
Dust Emission Magnitude from Earthworks			**Large**
Construction	Total building volume	36,736 m^3	Medium
	Potentially dusty construction materials?	Concrete, brick	Medium
	On-site concrete batching?	Unknown, assumed yes	Large
	Sandblasting?	Unknown, assumed yes	Large
Dust Emission Magnitude from Construction			**Large**
Trackout	Number of outward HGV movements in any one day	8 -10	Medium
	Dusty surface material?	Unknown, assumed moderately dusty	Medium
	Unpaved road length	Unknown, assumed 50 -100 m	Medium
Dust Emission Magnitude from Trackout			**Medium**

Table 5-2: Dust Emission Magnitude

5.12 A summary of the potential risk of dust impacts prior to mitigation, based on the 'low' sensitivity of the area to human health impacts and 'medium' sensitivity to dust soiling impacts is presented in **Table 5-3**.

5.13 Measures recommended to mitigate the dust impacts, based on the risk, are presented later in the report.

Dust Source	Emission Magnitude	Human Health Risk	Dust Soiling Risk	Overall Dust Risk
Demolition	Medium	Low	Medium	**Medium**
Earthworks	Large	Low	Medium	**Medium**
Construction	Large	Low	Medium	**Medium**
Trackout	Medium	Low	Low	**Low**

Table 5-3: Dust Risk Prior to Mitigation

6 Mitigation

Construction Phase

6.1 Best Practice Guidance for dust control will be implemented, as appropriate, during the construction phase through the DMP for the Proposed Development. The mitigation measures are based on the assessed risk of impacts presented in **Table 5-3**.

6.2 In accordance with the IAQM guidance the 'highly recommended' mitigation measures detailed in **Table 6-1** should be incorporated into the DMP for the development. The 'desirable' measures presented in **Table 6-2** should also be considered for inclusion.

6.3 The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is considered to be negligible.

Category	Measure
General	• 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.
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 offsite, and the action taken to resolve the situation in the logbook.
Monitoring	• Carry out regular site inspections to monitor compliance with the DMP or CEMP. 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. • Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences.
Preparing and maintaining the site	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or at the site boundary that are at least as high as any stockpiles on site. • Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive 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 and 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. • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
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. • 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.
Demolition	• Ensure effective water suppression is used during demolition operations. Handheld 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	• 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.

Table 6-1: Highly Recommended Dust Mitigation Measures

Category	Measure
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 windowsills within 100m of site boundary, with cleaning to be provided if necessary.
Operating vehicle/machinery and sustainable travel	• Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced 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). • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
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).
Earthworks	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Only remove the cover in small areas during work and not all at once.
Construction	• Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. • 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 logbook. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Table 6-2: Desirable Dust Mitigation Measures

Operational Phase

6.4 The Proposed Development will have a negligible impact on local air quality and therefore no further mitigation is required.

7 Cumulative Effects

Construction Phase

7.1 Following the implementation of the best practice mitigation measures outlined in this report, off-site dust impacts are anticipated to be negligible. Consequently, the cumulative impact of dust emissions from the site with other construction sites (which will also be subject to dust controls) is expected to be negligible.

Operational Phase

7.2 The Proposed Development will have a negligible impact on local air quality and therefore the cumulative impact is also negligible.

8 Residual Effects

Construction Phase

8.1 The residual effects of dust and particulate matter generated by construction activities will be minimised by following the mitigation measures outlined within this report. The residual effects are therefore considered to be negligible.

Operational Phase

8.2 The residual impact of the Proposed Development on local air quality is considered to be negligible.

9 Summary and Conclusions

9.1 An air quality impact assessment has been carried out to assess both construction and operational impacts of the Proposed Development.

9.2 An assessment of the potential impacts during the construction phase has been carried out. This has shown that during this phase of the Proposed Development releases of dust and PM_{10} are likely to occur during site activities. Through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM_{10} releases may be effectively mitigated, and the resultant impacts are considered to be negligible.

9.3 A review of local air quality monitoring data indicates that existing and future pollutant concentrations at the proposed development site will be well within the relevant long and short-term air quality standards. On this basis the site is considered suitable for residential and commercial use.

9.4 In accordance with the IAQM/ EPUK planning guidance, traffic generated during the operational phase of the development is not expected to affect local air quality.

9.5 Based on the results of the assessment, air quality is not considered a constraint to the development of the site, as proposed.

10 Limitations

10.1 The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the Site.

10.2 Third Party information has been used in the preparation this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for the same.

10.3 The benefits of this report are provided solely to Motor Fuel Lmited for the proposed development on the Tramway Road site only.

10.4 Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A – IAQM Construction Dust Methodology

Factors defining the sensitivity of a receptor to dust impacts are presented in Table A1.

Pollutant	Human Health	Dust Soiling	Ecological
High	- Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM_{10}. (a) - Examples include residential dwellings, hospitals, schools and residential care homes.	- Regular exposure - High level of amenity expected. - Appearance, aesthetics or value of the property would be affected by dust soiling. - Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.	- Nationally or Internationally designated site with dust sensitive features. (b) - Locations with vascular species. (c)
Medium	- Locations where workers are exposed over a time period relevant to the air quality objectives for PM_{10}. (a) - Examples include office and shop workers. (d)	- Short-term exposure - Moderate level of amenity expected. - Possible diminished. appearance or aesthetics of property due to dust soiling. - Examples include parks and places of work.	- Nationally designated site with dust sensitive features. (b) - Nationally designated site with a particularly important plant species where dust sensitivity is unknown.
Low	- Transient human exposure. - Examples include public footpaths, playing fields, parks and shopping streets.	- Transient exposure - Enjoyment of amenity not expected. - Appearance and aesthetics of property unaffected. - Examples include playing fields, farmland (e), footpaths, short-term car parks and roads.	- Locally designated site with dust sensitive features. (b)

(a) In the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more in a day.
(b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete).
(c) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.
(d) Does not include workers' exposure to PM10 as protection is covered by Health and Safety at Work legislation.
(e) Except commercially sensitive horticulture.

Table A1: Receptor Sensitivity

The sensitivity of the area as a whole is dependent on the number of receptors within each sensitivity class and their distance from the source. Human health impacts are also dependent on the existing PM_{10} concentrations in the area.

Table A2 and Table A3 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts, respectively. The sensitivity of the area to ecological impacts is presented in Table A4.

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

Table A2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	<32	>100	H	H	H	M	L
		10-100	H	H	M	L	L
		1-10	H	M	L	L	L
	28 – 32	>100	H	H	M	L	L
		10-100	H	M	L	L	L
		1-10	H	M	L	L	L
	24 - 28	>100	H	M	L	L	L
		10-100	H	M	L	L	L
		1-10	M	L	L	L	L
	<24	>100	M	L	L	L	L
		10-100	L	L	L	L	L
		1-10	L	L	L	L	L
Medium	<32	>10	H	M	L	L	L

		1-10	M	L	L	L	L
	28 – 32	>10	M	L	L	L	L
		1-10	L	L	L	L	L
	24 - 28	>10	L	L	L	L	L
		1-10	L	L	L	L	L
	<24	>10	L	L	L	L	L
		1-10	L	L	L	L	L
Low	-	>1	L	L	L	L	L

Table A3: Sensitivity of the Area to Health Impacts from Dust (H = High, M = Medium, L = Low)

Receptor Sensitivity	Distance from the Source (m)	
	<20	**<50**
High	H	M
Medium	M	L
Low	L	L

Table A4: Sensitivity of the Area to Dust Soiling Effects on People and Property

The magnitude of the dust impacts for demolition, earthworks, construction and trackout is classified as small, medium or large depending on the scale of the proposed works as detailed in Table A5.

Receptor Sensitivity	Large	Medium	Small
Demolition	- Total building volume >50,000m^3. - Potentially dusty material (e.g., concrete). - Onsite crushing and screening - Demolition activities >20m above ground level.	- Total building volume 20,000 - 50,000m^3. - Potentially dusty material - Demolition activities 10 - 20m above ground level.	- Total building volume <20,000m^3. - Construction material with low potential for dust release. - Demolition activities <10m above ground level. - Demolition during wetter months.
Earthworks	- Total site area >10,000m^2	- Total site area 2,500 - 10,000m^2.	- Total site area <2,500m^2.

	- Potentially dusty soil. type (e.g., clay). - >10 heavy earth moving vehicles active at any one time. - Formation of bunds >8m in height. - Total material moved >100,000 tonnes.	- Moderately dusty soil type (e.g., silt). - 10 heavy earth moving vehicles active at any one time. - Formation of bunds 4 - 8m in height. - Total material moved 20,000 - 100,000 tonnes.	- 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 >100,000m^3. - On site concrete batching. - Sandblasting.	- Total building volume 25,000 - 100,000m^3. - Potentially dusty construction material (e.g., concrete). - On site concrete batching.	- Total building volume <25,000m^3. - Material with low potential for dust release (e.g., metal cladding or timber).
Trackout	- >50 HGV movements in any one day (a). - Potentially dusty surface material (e.g., high clay content). - Unpaved road length >100m.	- 10 - 50 HGV movements in any one day (a). - Moderately dusty surface material (e.g., silt). - Unpaved road length 50 - 100m.	- <10 HGV movements in any one day (a). - Surface material with low potential for dust release. - Unpaved road length <50m.
(a) HGV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes.			

Table A5: Dust Emission Magnitude

For each dust emission source, the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts prior to mitigation as illustrated in Tables A6, A7 and A8.

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

Table A6: Risk of Dust Impacts from Demolition

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

Table A7: Risk of Dust Impacts from Earthworks and Construction

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

Table A8: Risk of Dust Impacts from Trackout

BROOKBANKS

Head Office Address

6150 Knights Court,

Solihull Parkway,

Birmingham Business Park,

Birmingham.

B37 7WY

T +44(0)121 329 4330

mail@brookbanks.com

brookbanks.com