

Project

Hough End Sports Village
Air Quality Screening and Dust Risk
Assessment

Prepared for

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1.0 Summary

The proposal is for the extension of the existing leisure centre, a new carpark, 2 artificial grass pitches, and refurbishment of the existing sports pitches, plus potential 278 Highways works.

The site is not within an Air Quality Management Area (AQMA). Although the site is not within an AQMA, Manchester City Council (MCC) and the Greater Manchester Combined Authority (GMCA) have established several AQMAs along the A5103 to the east of the site, as well as an AQMA to the west of the site, on Mauldeth Road West. These AQMAs were defined for annual mean exceedances of NO₂.

This air quality screening assessment has shown that:

- the IAQM threshold for construction HDVs is not expected to be exceeded
- the IAQM threshold for development generated LDVs is expected to be exceeded
- Construction activity associated with the proposed development is assessed to be:
 - **Medium** risk for dust soiling
 - **Low** risk for human health effects
 - **Low** risk for ecological effects.

Through good site practice and by adopting suitable mitigation measures, the residual effects are likely to be low. Recommended mitigation measures can be found in **Section 5.4**.

Although the IAQM/EPUK thresholds for construction have not been exceeded, the measures in **Sections 7.2** must be adhered to where practicable.

Occupants of the development will likely not be exposed to acceptable levels of PM₁₀ and PM_{2.5}.

Occupants of the development may be exposed to concentrations of NO₂, in roadside locations close to the air quality objective limit.

A detailed air quality assessment is necessary according to IAQM guidance due to the exceedance of the IAQM/EPUK threshold for LDV annual average daily traffic in an AQMA, once the site is operational. The measures in **Sections 7.2** must still be adhered to where practicable.

2.0 Introduction

The potential air quality impacts associated with the proposed development relate to:

- dust and particulate matter generated by construction activities
- increase in concentrations of nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) due to emissions generated by the emissions from construction traffic and additional road traffic once operational.

This initial assessment looks at the existing air quality conditions around the site, considers the local and national policy context, and describes the proposed assessment methodology.

3.0 Relevant Policy and Guidance

The Air Quality Strategy

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland¹ sets out air quality objectives and policy options to improve air quality in the UK. The main aim of the Strategy is to ensure that ambient air quality is of an acceptable level to protect human health and the environment. It takes account of the Limit Values set out in EU legislation.

Local Air Quality Management (LAQM)

The Environment Act 1995 introduced the LAQM system, whereby local authorities have a duty to review and assess air quality within their areas against the air quality objectives defined in the Air Quality Strategy. Where exceedances of the objectives are identified during this process, the authority must then declare an Air Quality Management Area (AQMA) and define the measures which will be implemented to improve air quality.

National Planning Policy Framework (NPPF)

The NPPF (2019)² sets out the Government's planning policies for England and outlines how they are expected to be applied to achieve the Government's aim of sustainable development. The NPPF states in paragraph 180 that:

“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.”

¹ Department for Environment, Food and Rural Affairs (DEFRA) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2)

² Ministry of Housing, Communities and Local Government (February 2019).

And at paragraph 181:

“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..... 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.”

Greater Manchester Air Quality Action Plan 2016 - 2021

The Greater Manchester Air Quality Action Plan³ was produced by the Greater Manchester Combined Authority (GMCA). The action plan describes the controls put in place to regulate the individual and cumulative impacts on air quality from new developments:

“GM (Greater Manchester) local authorities will adopt the most recent IAQM/EPUK guidance for air quality assessment as current best practice, to help ensure that planning applications consider potential local air quality impacts and opportunities to improve air quality are realised.”

GM local authorities to recommend mitigation controls in accordance with the most recent guidance and the other actions in this document for new developments that contribute to a deterioration of air quality in Air Quality Management Areas (AQMA)s.”

Clean Air Plan 2020

The GMCA’s Clean Air Plan (2020) will supersede the 2016-2021 Air Quality Action Plan once published.

The plan includes the launch of the Clean Air Zone (CAZ), as well as funding opportunities to enable the Greater Manchester area to meet the 40 µg m⁻³ target for ambient NO₂ concentrations throughout the entirety of its area by 2024.

Guidance

The following guidance documents have also been used where appropriate, in this assessment:

- Local Air Quality Management Technical Guidance (LAQM.TG(16))⁴
- Land-Use Planning and Development Control: Planning for Air Quality. VI.2⁵
- National Planning Practice Guidance - Air Quality⁶
- Guidance on the Assessment of Dust from Demolition and Construction⁷

³ Greater Manchester Combined Authority and Transport for Greater Manchester (2016).

⁴ DEFRA (2018). Part IV of the Environment Act 1995 Environment (Northern Ireland) Order 2002 Part III Local Air Quality Management Technical Guidance (TG16).

⁵ Environmental Protection UK / Institute of Air Quality Management (2017).

⁶ Department of Communities and Local Government (DCLG) (2014).

⁷ Institute of Air Quality Management (2014)

4.0 Existing Conditions

Existing air quality conditions near to the site have been defined after reviewing the following:

- Manchester City Council (MCC) and GMCA Review and Assessment reports and monitoring data;
- National Atmospheric Emissions Inventory (NAEI) data and maps;
- DEFRA's Local Air Quality Management (LAQM) Support Pages, including background maps; and
- Maps and plans of the site and surrounding area.

4.1 AQMAs

The site is not within an Air Quality Management Area (AQMA), however several AQMAs have been established along the A5103 to the east of the site, as well as an AQMA to the west of the site, on Mauldeth Road West. These AQMAs were defined for annual mean exceedances of NO₂.

Figure 1. Site Location



Legend



4.2 Wind Direction

The prevailing winds in Manchester are from the south⁸, therefore receptors to the north of the site are most likely to be affected by emissions from the proposed development.

4.3 Industrial Point Sources

A review of the NAEI point source inventory shows that there are a few large point source emitters of pollutants, specifically NO₂ and particulate matter (PM₁₀ and PM_{2.5}), near the site. The following sites emit all the specified pollutants:

- The Chorlton-cum-Hardy Crematorium is located approx. 700 m to the southwest of the site,
- Spire Manchester Hospital to the approx. 1 km south.

These point source emitters are upwind of the proposed development. These emitters are relatively close, and therefore there is potential for emissions from these sites to affect the proposed development, as the prevailing wind will push pollutants towards the site.

- United biscuits UK Ltd. located approx. 5 km to the east of the site.

This point source emitter is in an area that will have little influence on the site (and not be influence by emissions from the site in return).

- Heineken located approx. 2.3 km to the north of the site.

This emitter is downwind from the site most of the time, so it is unlikely that emissions from this point source will affect the site in return due to the direction of the prevailing wind.

While there are some nearby point source emitters that may affect concentrations of pollutants at the site, the localised nature of the nearby AQMAs imply that road traffic is likely the most important factor in pollutant concentrations at the proposed development.

⁸ Iowa Environmental Mesonet (IEM), accessed 17/03/2021, available at: <https://mesonet.agron.iastate.edu/>

4.4 Background Pollutant Concentrations

Table I summarises the background pollutant concentrations of NO₂, PM₁₀ and PM_{2.5} used in the assessment for the area encompassing the proposed development. Background concentrations of NO₂, PM₁₀ and PM_{2.5} have been taken from the most recent version of DEFRA's background maps. 2019 represents the base year; 2019 is the most recently reported monitoring dataset for the MCC/GMCA administrative area. 2022 represents the first year of operation. In each assessment year, the DEFRA annual mean background concentrations are well below the relevant objectives.

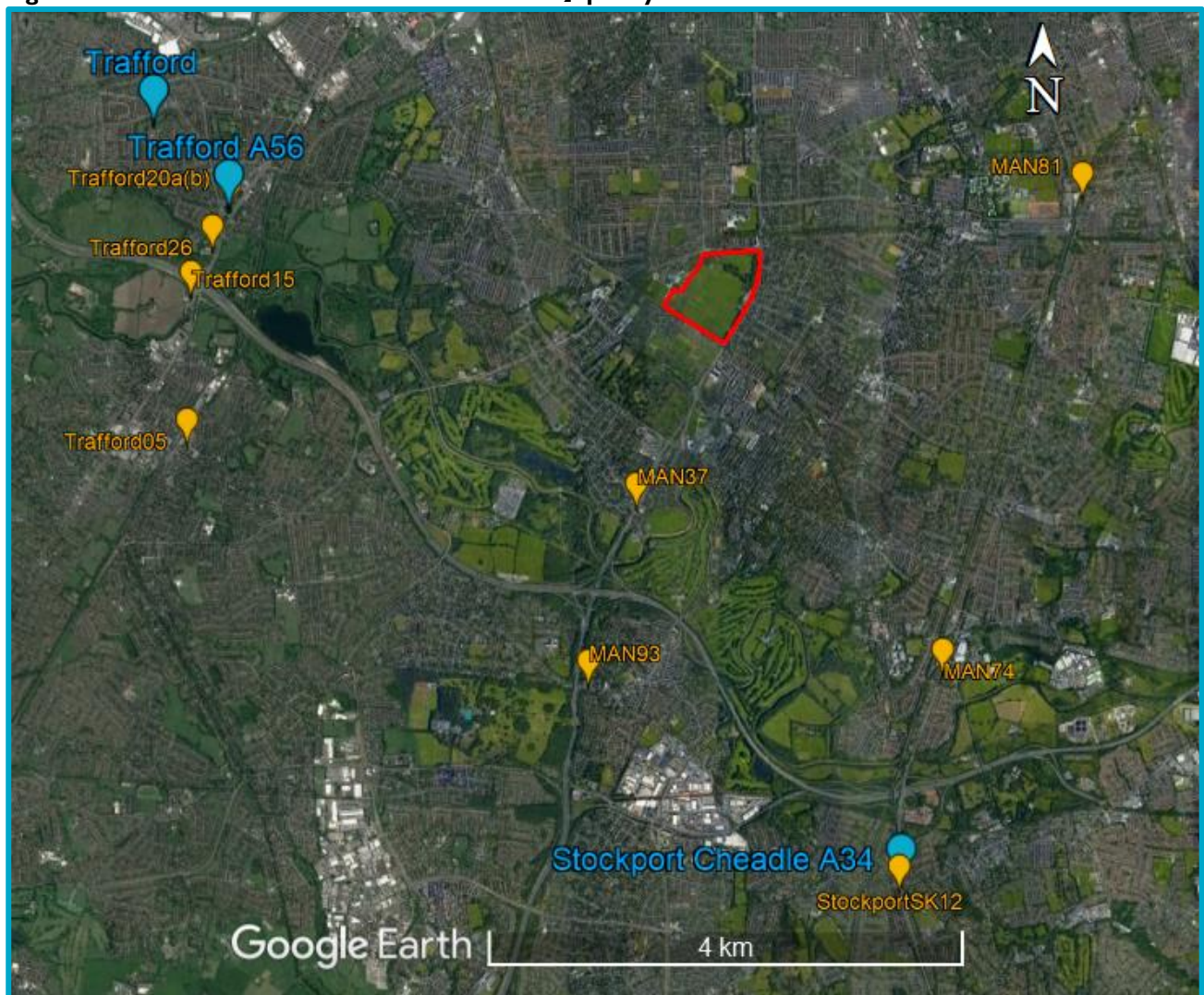
Table I. Background Pollutant Concentrations (µg/m³)

Grid Square	NO ₂		PM ₁₀		PM _{2.5}	
	2019	2022	2019	2022	2019	2022
383500, 393500	16.8	14.8	12.0	11.5	8.1	7.8
383500, 392500	17.6	15.4	12.1	11.6	8.0	7.7
382500, 393500	15.9	14.1	11.9	11.4	8.1	7.8

4.5 NO₂ Monitoring

Figure 2 shows the most relevant NO₂ monitoring locations to the site. Data for these monitors is shown in **Table 2**.

Figure 2. Site location in relation to relevant NO₂ quality monitors



Legend



Automatic Monitors



Diffusion Tube Monitors



Site

Table 2. NO₂ Monitoring Data

Monitoring Site ID	Site Type	OS Grid Ref.	Height (m)	Annual Mean NO ₂ Concentrations (µg/m ³)				
				2015	2016	2017	2018	2019
Automatic								
Trafford	Urban Background	378783, 394726	2.5	20.0	22.0	19.0	18.0	19.0
Trafford A56	Urban Traffic	379413, 394014	2.5	30.0	33.0	30.0	29.0	30.0
Stockport Cheadle A34	Roadside	385047, 388339	2.0	-	-	43.0	37.0	36.0
Diffusion Tube								
MAN37	Urban Traffic	382829, 391493	3.0	41.8	46.3	42.6	39.3	38.7
MAN74	Urban Traffic	385399, 390093	3.0	35.4	38.0	37.1	35.7	33.6
MAN81	Urban Background	386589, 394083	3.0	23.3	25.9	25.2	21.8	23.1
MAN93	Urban Traffic	382419, 390010	3.0	-	-	-	-	42.9
StockportSK12	Urban Traffic	392781, 387271	2.5	50.4	54.5	42.4	38.0	36.6
Trafford05	Urban Background	379052, 392043	4.0	24.2	25.5	24.1	24.0	24.3
Trafford15	Urban Traffic	379089, 393282	4.0	28.8	33.3	30.6	29.2	29.9
Trafford20a(b)	Urban Traffic	379418, 394009	3.0	-	-	32.2	29.5	29.8
Trafford26A	Urban Traffic	379272, 393667	3.0	-	-	44.2	40.1	39.3
Objective								
40µg/m ³								

Annual average NO₂ concentrations exceeding the NO₂ objective are shown in bold. NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in bold and underlined.

The GMCA monitor over 400 locations in Manchester. In **Figure 4**, the locations most relevant to the site are shown. Most are chosen due to being geographically closest, and others provide comparison for the closest automatic monitors.

Automatic monitors are some distance from the site; Trafford and Trafford A56 are to the west, approx. 4.2 km and 3.4 km away respectively. Stockport Cheadle is approx. 5.5 km south-east. Trafford A56 and Stockport Cheadle are located on a roundabout and junction respectively, therefore neither are particularly representative of the conditions at the proposed development due to traffic queues, or otherwise slow-moving traffic. Trafford is located in an urban background location, which is in an area of green space, smaller than that of the proposed development, but still representative. It can be assumed that the conditions at this monitor are representative of those across the non-roadside locations at the site.

Urban Traffic diffusion tube monitors typically report an overall reduction in ambient NO₂ concentrations over the last 5 years of measurements. As shown in **Table 2**, exceedances of the air quality objective (AQO) for NO₂ were measured at MAN37, StockportSK12, Trafford 26A, and MAN93. MAN93 is the only monitor to have reported an exceedance in 2019; this appears to be a new monitoring location, as there were no measurements taken in previous years. NO₂ concentrations measured at StockportSK12 were the highest historically.

Urban Background monitors typically report stable results, with annual NO₂ concentrations varying by less than $\pm 3 \mu\text{g}/\text{m}^3$ annually. Neither of these monitors have reported an exceedance of the AQO in the last 5 years.

The closest diffusion tube monitors, MAN37 and MAN93, are in roadside locations; the former, on the A5103/Princess Road, like the site, and the latter on the B5167 close to the junction with the M60. The large junction for the M60 will likely influence the traffic (and therefore emissions experienced) at these monitoring locations. Furthermore, MAN93 is likely to be influenced by queues caused by the traffic lights, which makes this monitor less representative of conditions at the site of the proposed development. The large junction where the A5103 meets the A5145, that is located between MAN37 and the stretch of road that the proposed development is on may have a similar effect. The A5103 is a main route, so it could be assumed that traffic joins it preferentially. From that assumption, it can also be assumed that emissions on the eastern boundary of the site are like those experienced at MAN37. Mauldeth Road West, running along the northern boundary of the site, also crosses the A5103, and has a direct link to the A6010, which may result in the road being well trafficked. The junction of Mauldeth Road and the A5103 is traffic light controlled, which will lead to traffic queues, and may in turn affect the north-eastern corner of the site. This area is shielded by trees so these effects may be dampened. The other parts of the site adjacent to Mauldeth Road are expected to have NO₂ concentrations similar to those at MAN37 as a worst case.

The proposed development is predominantly a large green site, with open fields/pitches. None of the monitors in **Table 2** are placed in locations that mirror this exactly. However, MAN81 is located by a smaller area of green land, in a primarily residential area; its location in a cul-de-sac means that it will not see any significant amount of traffic. This urban background monitor consistently reported NO₂ concentrations below $26 \mu\text{g}/\text{m}^3$ (65 % of the AQO) over the past 5 years. Therefore, given that both locations experience little to no traffic it is reasonable to assume that the parts of the proposed

development that are not influenced by road traffic will have ambient NO₂ concentrations similar or less than what has been reported at MAN81.

Overall, it is not expected that the AQO for ambient NO₂ concentrations will be exceeded at the site, although, the parts of the site close to roads may be within 90 % (36 µg/m³) of the AQO.

4.6 PM₁₀ Monitoring

MCC/GMCA monitor PM₁₀ at several locations within their administrative area. Data for the monitors most relevant to the site are shown in **Table 3**.

Table 3. PM₁₀ Monitoring Data

Monitoring Site ID	Site Type	OS Grid Ref.	Height (m)	Annual Mean PM ₁₀ Concentrations (µg/m³)				
				2015	2016	2017	2018	2019
Automatic								
Trafford	Urban Background	378783, 394726	2.5	15.0	15.0	13.0	14.0	15.0
Trafford A56	Urban Traffic	379413, 394014	2.5	18.0	17.0	15.0	18.0	17.0
Stockport Cheadle A34	Roadside	385047, 388339	2.0	-	-	18.0	19.0	17.0
Objective								
40µg/m³								

As described in **Section 4.5**, the Trafford monitor is the most representative of conditions at the site due to its surroundings. As such it is reasonable to assume that that concentrations of PM₁₀ at the site are similar in non-roadside locations. The other monitors, while less representative give an indication of what conditions may be like along the site boundary. Concentrations at site are not likely to exceed the AQO for PM₁₀ (40 µg/m³).

4.7 PM_{2.5} Monitoring

MCC/GMCA monitors PM_{2.5} at several locations within their administrative area. None of these monitors are suitable for use in this assessment, due to the distance between their locations and the site. DEFRA background data will be used for the purpose of continuing the assessment.

DEFRA background concentrations for PM_{2.5} at the site in 2019 were approx. 7.8 µg/m³, which is below the AQO of 25 µg/m³ for PM_{2.5}.

5.0 Dust Risk Assessment

5.1 Dust Emission Magnitude

During the construction phase, activities may generate dust and particulate matter, as well as exhaust emissions from construction vehicles and plant, which could result in complaints of nuisance and human health effects.

The likely level of risk has therefore been assessed following guidance published by the Institute of Air Quality Management (IAQM). The assessment considers the nature and scale of the activities undertaken and the sensitivity of the surrounding area. Mitigation measures proportionate to the level of risk identified are then set out.

Additionally, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the site and near the site itself. As precise information on the number of vehicles and plant associated with each part of the construction phase is not yet known, a qualitative assessment of their impact on local air quality has been done using professional judgement and by considering the following:

- The likely number and type of construction traffic and plant;
- The number and proximity of sensitive receptors to the site;
- The likely duration of the construction period; and
- The nature of the activities undertaken.

The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition, earthworks, construction, and trackout.

5.1.1 Demolition

The existing changing block is the only building that is scheduled to be demolished. The maximum demolitions height is approx. 5m. The approx. building area is 655 m². With these dimensions, the approximate building demolition volume is 3,275 m³.

Following IAQM guidance, the potential dust emission magnitude from demolition is judged to be **small**, as this volume is below the 20,000 m³ assessment threshold.

5.1.2 Earthworks

Earthworks onsite include breaking out areas of hard landscaping, reduced level excavation, and groundwork for the foundation and slab. The soil texture over most of the site is sandy to sandy loam, with very small areas of clay to sandy loam soil⁹. Sandy soils are less prone to mobilisation into the air than clayey soils due to their larger particle sizes. The approximate area of earthworks includes the area dedicated to new sports pitches and is approx. 23 ha. Following IAQM guidance, the potential dust emission magnitude from earthworks is judged to be **large** due to the size of the potential earthworks area.

⁹ British Geological Society (BGS), UK Soil Observatory (UKSO) available at: <http://mapapps2.bgs.ac.uk/ukso/home.html>, accessed: 19/03/2021

5.1.3 Construction

One 2-storey building is to be constructed on site. All other construction works will be internal to the existing building. The dimensions of the new block are approx. 31 m x 25 m x 10.5 m, which equates to an overall construction volume of approx. 8140 m³. Construction materials include brick, concrete, cladding (aluminium, masonry), and steel (steel framing system). Brick and concrete are potentially dusty materials; concrete is especially dusty if being batched on site. The risk of dust emissions from these are reduced if these are precast and/or cladding components (i.e., can be slotted into position). Other listed materials are not particularly dusty.

Following IAQM guidance, the potential dust emission magnitude from construction is judged to be **small**, as the total construction volume is far below the 25,000 m³ assessment threshold.

5.1.4 Trackout

6 vehicles are planned to be associated with the site during the construction phase. If each vehicle makes 2 trips, per day, then there will be 12 outward movements from site daily. The proposed development is well connected by road; however, the internal area of the site has little in the way of paving/tarmac. There will be works occurring on the grass area so it is likely that vehicles will have to travel over unpaved areas over 100 m in length.

Following IAQM guidance, the potential dust emission magnitude from trackout is judged to be **medium**.

5.1.5 Summary of Dust Emission Magnitude

Table 4. Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Large
Construction	Small
Trackout	Medium

5.2 Sensitivity of the Study Area

5.2.1 Dust Soiling Effects

The proposed development is located in an area which is primarily residential; the north and east boundaries of the site are adjacent to roads; the southern boundary is adjacent to a rail line serving the Withington tram stop. The roads and rail line are bordered by residential dwellings. On the western boundary of the site is the Hough End Centre, which is a sports and social club, often also used for events and conventions. There is an allotment adjacent to the railway on the southern boundary of the site located east of the southern residential dwellings, and further east is the Withington tram stop.

All residential receptors are classed as high sensitivity; they experience greater impacts to dust emissions. Impacts can be based on aspects of comfort, monetary value, cultural value, and potential exposure time. St Bernadette's Catholic church may also be considered a high sensitivity receptor.

The allotment is a medium sensitivity receptor, along with the Hough End Centre, Hough End Leisure Centre itself, and there is a small parade of shops on Princess Road, the petrol filling station on Mauldeth Road, and the Withington tram stop. Hough End Leisure Centre is counted as a receptor as it is scheduled be open for public use while works are occurring.

Surrounding footpaths, and fields are classed as low sensitivity, along with Hough End Leisure Centre's car park.

Of these receptors, those located to the north of the site are most likely to be affected by fugitive dust emissions from construction works occurring at the proposed development site due to the direction of the prevailing wind.

1) Demolition

The only building scheduled for demolition is the changing facility, which has been condemned as structurally unsound. The only receptor within 50 m of the demolition boundary is the Hough End Leisure Centre itself: specifically, the carpark, and the playing fields. The current extent of the main leisure centre building is within 100 m of the demolition boundary, as are residential properties on Princess Road. Approximately 20 dwellings are located within 100 m.

The sensitivity of the local area to dust soiling effects due to demolition is **low** due to the number of sensitive receptors and their distance from the proposed works.

Figure 3. Demolition boundary with 20 m, 50 m, and 100 m buffers



Legend

Demolition Boundary	20m Buffer	50m Buffer	100 m Buffer
---------------------	------------	------------	--------------

2) Earthworks

Earthworks will potentially be occurring across most of the site, for the installation of new sports pitches, car parks, and landscaping. The earthworks boundary shown in **Figure 4** is an estimation based on the proposed pitch development boundary, shown in the pitches sketch site layout plan for Hough End Leisure Centre (ref. HEV-EWA-03-XX-SK-A-50411, dated 27/11/2020).

The Hough End Leisure Centre is located within 20 m of the site works. Approximately 45 Residential dwellings on Mauldeth Road West (33) and Princess Road (12) are located within 50 m of proposed work area. This number does not include the part of the Windsor House residential estate that is located at the junction of Mauldeth Road West and Princess Road, housing approximately 40 dwellings. A very small part of this estate may be impacted, however, depending on how the ventilation of the building is performed, dust emissions could be distributed throughout the building. As such, all residential dwellings in Windsor House will be included in this assessment. A total of 80 residential dwellings are estimated to be within 50 m of the earthworks area.

The sensitivity of the local area to dust soiling effects to due to earthworks is **medium**, due to the number of high sensitivity receptors, within 50 m of the potential earthworks area.

Figure 4. Earthworks boundary with 20m and 50m buffers



Legend

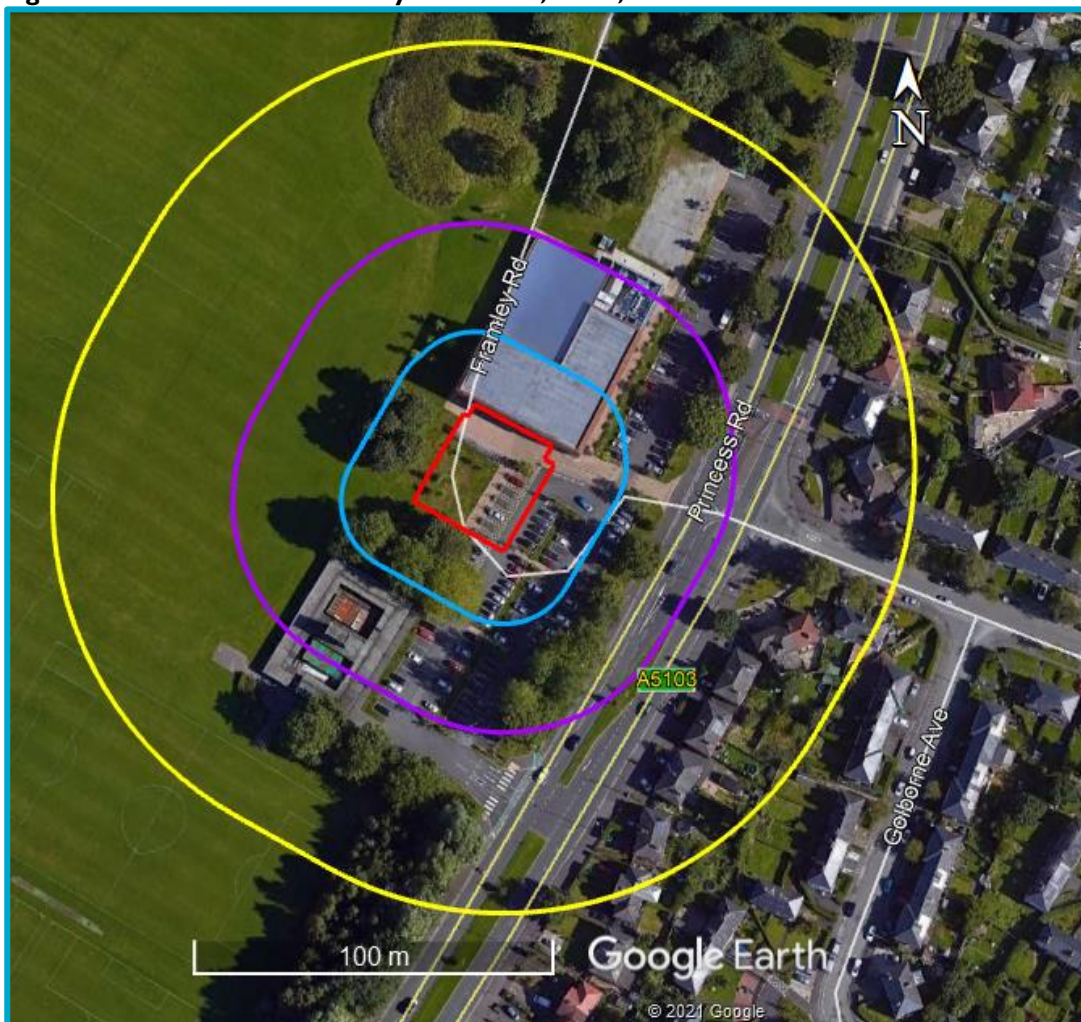
Earthworks Boundary	20m Buffer	50m Buffer
------------------------	------------	------------

3) Construction

The area marked for construction is relatively small; it is an extension of the current leisure centre building as shown in **Figure 5**. **Figure 5** shows the approximate construction area based on the Sketch Site Layout Plan (ref. HEV-EWA-Z2-00-SK-A-50410, dated 30/10/2020). The closest receptor is the Hough End Leisure Centre, which is located adjacent to the construction area, and therefore within 20 m of the construction boundary. There are residential dwellings, approx. 21, located on Princess Road and Whitchurch Road, within 100 m of the construction boundary.

The sensitivity of the local area to dust soiling effects due to construction is **medium** due to the proximity of the parts of Hough End Leisure Centre that will be in use during the construction phase.

Figure 5. Construction boundary with 20 m, 50 m, and 100 m buffers



Legend

Construction Boundary	20m Buffer	50m Buffer	100 m Buffer
-----------------------	------------	------------	--------------

4) Trackout

Access to the site is likely to be primarily from Princess Road; **Figure 6** shows the most likely trackout route from this access point for 500 m of road in northern and southern directions. This distance is chosen as the site is classed as large (greater than 2,500 m²) following IAQM guidance. There is the possibility that heavy duty vehicles (HDVs) may enter the site via Framley Road to the north, however, given the size of the road that may not be preferable, unless works are occurring in that area. Access is paved for works that are occurring near the main leisure centre building. Works on the field to install pitches will not have paved access to much of the area, so it is likely that construction vehicles will travel over unpaved paths of over 100 m.

There are a minimum of 29 residential dwellings within 20 m of the southern route on Princess Road, as well as St Bernadette's Catholic Church and a parade of 4 commercial businesses. The northern route on Princess Road has over 100 residential dwellings within 20 m including those in Windsor House.

The sensitivity of the local area to dust soiling effects due to trackout is **high** due to the large number of residential dwellings within 20 m of the trackout route in northern and southern directions. Although not shown in **Figure 6**, as it is far less likely to be used, the sensitivity of the local area to dust soiling using the Framley Road access is also high due to the number and proximity of residential dwellings.

Figure 6. Trackout route with 20 m and 50 m buffers



Legend

Site Boundary



Trackout Route

20m Buffer

50m Buffer

5.2.2 Health Effects of PM₁₀

The receptors identified in the previous section for the effect of dust soiling are relevant here, as there are health implications for sensitive receptors due to the dispersion and deposition of PM₁₀.

In **Table 1** the DEFRA background data on PM₁₀ show that the concentration was approx. 12.0 µg/m³ in 2019 which is below the annual mean objective of 40 µg/m³, as well as the 24µg/m³ regime defined in the IAQM guidance. The measured data in **Table 3** show concentrations of 14.0 µg/m³ in an urban background location, and 17 µg/m³ in roadside locations. These values are also below the annual mean objective of 40 µg/m³, and the 24µg/m³ regime. Measured data will be taken forward in this assessment to represent more realistic conditions at the site, and the roadside measurement (17.0 µg/m³) will be used to represent a worst case.

5) Demolition

Approximately 20 dwellings are located within 100 m of the demolition boundary, and the Hough End Leisure Centre within 50 m the boundary. With receptors likely be exposed to 17.0 µg/m³ of PM₁₀, the health effects due to demolition are judged to be **low** due to the distance of receptors and relatively low background PM₁₀ concentrations.

6) Earthworks

There are approximately 80 residential dwellings within 50 m of the earthworks boundary, and the Hough End Leisure Centre is within 20 m. With receptors likely be exposed to 17.0 µg/m³ of PM₁₀, the health effects due to earthworks are judged to be **low** due to the distance, and number of receptors, and relatively low background PM₁₀ concentrations.

7) Construction

The Hough End leisure centre is located within 20 m of the construction boundary, and the closest residential receptors are located within 100 m. With receptors likely be exposed to 17.0 µg/m³ of PM₁₀, the health effects due to construction are judged to be **low** due to the distance of receptors and relatively low background PM₁₀ concentrations.

8) Trackout

Over 100 residential dwellings are located within 20 m of the northern trackout route and a minimum of 29 located on the southern trackout route. Following the worst-case scenario (i.e., the greatest number of receptors potentially affected), with receptors likely be exposed to 17.0 µg/m³ of PM₁₀, the health effects due to trackout are judged to be **medium**.

5.2.3 Ecological Effects

There are no sites with ecological designations within 50 m of the site boundary, nor within 50 m of the trackout routes. The closest are the Chorlton Water Park Local Nature Reserve (LNR), which is approx. 1.5 km southwest of the site, and the Chorlton Ees & Ivy Green LNR, approx. 2.2 km west of the site. LNRs typically have a low sensitivity to dust effects. These sites are located upwind of the site in the most

common conditions, and therefore have less potential to be impacted by construction phase works at the proposed development.

Overall, the sensitivity of ecological receptors to dust is judged to be **low**.

5.2.4 Summary of Sensitivity to Dust Effects

Table 5 summarises the sensitivities assessed for the area. The highest sensitivities assessed are recorded within the table and will be taken forward in the assessment.

Table 5. Sensitivity of Area

Potential Impact	Sensitivity of Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Medium	Medium	High
Human Health	Low	Low	Low	Medium
Ecological	Low	Low	Low	Low

5.3 Overall Dust Impact Risk

The predicted dust emission magnitude (**Table 4**) has been combined with the sensitivity of the area (**Table 5**) to determine the risk of impacts during the construction phase, prior to mitigation. **Table 6** summarises the risk of dust impacts for the proposed development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 6. Summary of Dust Risk Impacts

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

5.4 Dust Mitigation Measures

The following mitigation measures are recommended by IAQM to reduce the identified level of risk associated with dust soiling and human health effects during the construction phase.

Communications
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
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. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
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 logbook.
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 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.
Agree dust deposition, dust flux, or real-time PM₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
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 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.
Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph 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).
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.

Measures Specific to Earthworks

Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.

Use Hessian, mulches or trackifiers 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.

Measures Specific to 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.

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 powder materials, ensure bags are sealed after use and are stored appropriately to prevent dust.

Measures Specific to 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).

6.0 Construction and Operational Phase Impacts

6.1 Construction Vehicles and Plant

The predicted number of HDVs to be visiting the site per day during the construction phase is 6. If each vehicle makes 1 trip daily, a total of 12 movements would be made per day; if 2 trips were made daily, 24 movements would be expected per day. The construction period is scheduled for approx. 45 weeks. While the site itself is not within an AQMA, large parts of Princess Road, (the main access route) are. Therefore, the IAQM/EPUK threshold for HDV movements within an AQMA will be applied here. Examination of the information provided indicates that the IAQM/EPUK threshold for HDV movements, 25 within an AQMA per day, will not be exceeded.

6.2 Operational Road Traffic

The car parking provision at the proposed development is set to increase to a total of 362 places. The Transport Assessment performed by Curtains Consulting Ltd. for the development describes the trip generation for the leisure centre extension and the new sports pitches. The A5103/Princess Road is likely to be the main access for users of the facility, and this route forms part of the MCC/GCMA AQMA. It is expected that the IAQM/EPUK threshold for LDV movements, 100 within an AQMA will be exceeded once the site is operational, as confirmed by the transport assessment, and the consultants. The effects of this exceedance will need to be assessed in a detailed air quality assessment with dispersion modelling.

7.0 Mitigation

7.1 Construction Phase Mitigation

The assessment of potential construction phase impacts has found that the proposed development is **medium risk** for dust soiling, **low risk** for human health effects and **low risk** for ecological effects.

Section 5.4 presents mitigation measures that should be used to reduce the risk of air quality impacts during the construction phase of the proposed development.

7.2 Good Practice Measures

In Section 5.10 of the IAQM/EPUK guidance, the following examples of good practice principles are listed:

“Design Phase:

- *The provision of at least 1 Electric Vehicle (EV) “fast charge” point per 10 residential dwellings and/or 1000m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made*
- *New developments should not contravene the Council’s AQAP, or render any of the measures unworkable*
- *Wherever possible, new developments should not create a new “street canyon”, or a building configuration that inhibits effective pollution dispersion*
- *Delivering sustainable development should be the key theme of any application*
- *New development should be designed to minimise exposure to pollution sources, e.g., by locating habitable rooms away from busy roads or directing combustion generated pollutants through well sited vents or chimney stacks.*

Operational Phase:

- *Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measures its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure, and layouts to improve accessibility and safety*
- *All gas-fired boilers to meet a minimum standard of <40mgNO_x/kWh*
- *All gas-fired CHP plant to meet a minimum emission standard of:*
 - *Spark ignition engine: 250mgNO_x/Nm³*
 - *Compression ignition engine: 400mgNO_x/Nm³*
 - *Gas turbine: 50mgNO_x/Nm³*
- *A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of:*
 - *Solid biomass boiler: 275mgNO_x/Nm³ and 25mgPM/Nm³”*

8.0 Conclusions

8.1 Existing Air Quality

8.1.1 NO₂

This assessment has shown that the NO₂ concentration at the site is likely to be below the annual mean objective limit of 40µg/m³. Local authority monitoring data (**Table 2**) shows that NO₂ concentrations are close to 90 % of the limit in roadside locations and approximately 75 % of the limit at locations towards the centre of the site. Future occupants of the development will therefore likely be exposed to acceptable levels of NO₂.

8.1.2 PM₁₀

This assessment has shown that the PM₁₀ concentration at the site is likely to be below the annual mean objective limit of 40 µg/m³. DEFRA background data (**Table 1**) show that the PM₁₀ concentration at the site is approx. 12.0 µg/m³ and local authority monitoring data (**Table 2**) show that the PM₁₀ concentration at the site is likely approx. 17.0 µg/m³. Future occupants of the development will therefore likely be exposed to acceptable levels of PM₁₀.

8.1.3 PM_{2.5}

This assessment has shown that the PM_{2.5} concentration at the site is likely to be below the annual mean objective limit of 25µg/m³. DEFRA background data (**Table 1**) show that the PM_{2.5} concentration at the site is 7.8 µg/m³. Future occupants of the development will therefore likely be exposed to acceptable levels of PM_{2.5}.

8.2 Construction Phase

The assessment of potential construction phase impacts has found that the proposed development is **medium risk** for dust soiling, **low risk** for human health effects and **low risk** for ecological effects. **Section 5.4** presents mitigation measures that could be used to reduce the risk of air quality impacts during the construction phase of the proposed development.

The IAQM/EPUK threshold for HDVs is not expected to be exceeded; therefore, this does not need to be assessed further in a detailed air quality assessment.

8.3 Operational Phase

The IAQM/EPUK threshold for LDVs is expected to be exceeded; therefore, this needs to be assessed further in a detailed air quality assessment.

8.4 Mitigation

This assessment has shown the maximum dust risk to be **medium risk**. The mitigation measures in **Section 5.4** are recommended by the IAQM for medium risk sites and must be adhered to in order to reduce dust risk.

Although the IAQM/EPUK thresholds for construction traffic have not been exceeded, the measures in **Section 7.2** must be adhered to where practicable.

Mitigation for operational traffic, if necessary, will be given following a detailed assessment with dispersion modelling.

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