Air Quality Assessment

Land at Henfield Road, Albourne

July 2022

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Croudace Homes Limited

Croudace House
Tupwood Lane
Caterham
Surrey
CR3 6XQ

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Phlorum Limited

Southern Office: Unit 12, Hunns Mere Way, Woodingdean, Brighton, East Sussex, BN2 6AH

T: 01273 307 167 E: info@phlorum.com W: www.phlorum.com

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1. Introduction

Background

1.1 Phlorum Limited has been commissioned by Croudace Homes Limited to undertake an air quality assessment to support an outline planning application for a residential development on Land at Henfield Road, Albourne (BN6 9DH). The National Grid Reference for the centre of the site is 526328, 116729. The location of the site is shown in Figure 1.

1.2 The proposed development comprises the construction of up to 120 residential dwellings, with the provision of a community orchard and associated parkland. Proposals also include school expansion land and a car park on-site to help alleviate parking issues at the adjacent Albourne CofE Primary School.

1.3 The application site is situated on a parcel of greenfield land bounded by Albourne CofE Primary School to the east, and the B2116 Henfield Road and Church Lane to the north and south, respectively. Land-use in the vicinity of the site is largely rural in nature.

1.4 The main sources of air pollution in the vicinity of the application site are vehicles travelling on the local road network, particularly the nearby B2118 and B2116 Henfield Road.

1.5 Mid Sussex District Council (MSDC), the local planning authority, has declared one Air Quality Management Area (AQMA) within its administrative boundary, due to an exceedance of the annual mean Air Quality Standard (AQS) for nitrogen dioxide (NO_2). Established in 2012, the Mid Sussex AQMA 1, centred at the Stonepound Crossroads, is located approximately 3.8km to the south-east of the application site.

Scope of Assessment

1.6 The focus of this assessment will be to assess the suitability of the site, in air quality terms, for the introduction of new, sensitive receptors. Further modelling is currently undertaken to assesses the potential for traffic generated by the proposed development to impact local air quality.

1.7 The report also assesses the potential for dust nuisance and soiling impacts to occur due to the construction of the proposed development, offering recommendations for suitable mitigation to reduce the possibility of such impacts occurring.

2. Policy Context

The UK Air Quality Strategy

2.1 The UK Air Quality Strategy (UKAQS)[1] sets out air quality standard (AQS) concentrations for a number of key pollutants that are to be achieved at sensitive receptor locations across the UK by corresponding air quality objective (AQO) dates. The sensitive locations at which the standards and objectives apply are those where the population are reasonably expected to be exposed to said pollutants over the particular averaging period.

2.2 For those objectives to which an annual mean standard applies, the most common sensitive receptor locations used to compare concentrations against the standards are areas of residential housing. It is reasonable to expect that people living in their homes could be exposed to pollutants over such a period of time.

2.3 Schools and children's playgrounds are also often used as sensitive locations for comparison with annual mean objectives due to the increased sensitivity of young people to the effects of pollution (regardless of whether or not their exposure to the pollution could be over an annual period). For shorter averaging periods of between 15 minutes, 1 hour or 1 day, the sensitive receptor location can be anywhere where the public could be exposed to the pollutant over these shorter periods of time. A summary of the AQS relevant to this assessment are included in Table 2.1, below.

Table 2.1 UK Air Quality Standards and Objectives

Pollutant	Averaging Period	Air Quality Standard (µg.m^{-3})	Air Quality Objective
Nitrogen dioxide (NO_2)	1 hour	200	200 µg.m^{-3} not to be exceeded more than 18 times a year
	Annual	40	40 µg.m^{-3}
Particulate Matter (PM_{10})	24-hour	50	50 µg.m^{-3} not to be exceeded more than 35 times a year
	Annual	40	40 µg.m^{-3}
Particulate Matter ($PM_{2.5}$)	Annual	20	20 µg.m^{-3}

1 Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2) July 2007.

2.4 The objectives adopted in the UK are based on the Air Quality (England) Regulations 2000[2], as amended, for the purpose of Local Air Quality Management. These Air Quality Regulations have been adopted into UK law from the limit values required by European Union Daughter Directives on air quality.

2.5 The UKAQS for $PM_{2.5}$ was recently amended as part of The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[3].

2.6 Obligations under the Environment Act 1995 require local authorities to declare an AQMA at sensitive receptor locations where an objective concentration has been predicted to be exceeded. In setting an AQMA, the local authority must then formulate an Air Quality Action Plan (AQAP) to seek to reduce pollution concentrations to values below the objective levels.

2.7 MSDC has established one AQMA within their administrative boundary, located at the Stonepound Crossroads in nearby Hassocks. Located approximately 3.8km from the application site, this AQMA was declared in 2012, due to exceedances of the annual mean AQS for NO_2. As a result of this declaration, MSDC have developed an AQAP[4] for this management area, outlining a number of actions and strategies to reduce pollution levels within this area.

National Planning Policy Framework

2.8 The National Planning Policy Framework (NPPF)[5], which was updated in July 2021, sets out the Government's planning policy for England. At its heart is an intention to promote more sustainable development. A core principle in the NPPF that relates to air quality effects from development is that planning should "contribute to conserve and enhance the natural and local environment" as demonstrated at paragraph 174:

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

preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability [...]".

2.9 With regard to assessing cumulative effects the NPPF states the following at paragraph 185:

"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

2 The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043.
3 The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020
4 Mid Sussex District Council. (2020). *Stonepound Crossroads Air Quality Action Plan (Updated 2020*).
5 Ministry of Housing, Communities & Local Government. (2021). *National Planning Policy Framework*.

the potential sensitivity of the site or wider area to impacts that could arise from the development."

2.10 With regard to a compliance with relevant limit values and national objectives for air pollutants, along with assessing cumulative effects the NPPF states the following at paragraph 186:

"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 to mitigate impacts should be identified, such as though traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

2.11 With regard to promoting sustainable transport, paragraph 105 states:

"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making"

2.12 The NPPF offers a broad framework but does not afford a detailed methodology for assessments. Specific guidance for air quality continues to be provided by organisations such as the Department for Environment, Food and Rural Affairs (Defra), Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM).

National Planning Practice Guidance

2.13 Reference ID 32 (Air Quality) of the National Planning Practice Guidance (PPG)[6], which was updated in November 2019, provides guiding principles on how planning can take account of the impact of new development on air quality. The PPG summarises the importance of air quality in planning and the key legislation relating to it.

2.14 As well as describing the importance of International, National and Local Policies (detailed elsewhere in this report), it summarises the key sources of air quality information. It also explains when air quality is likely to be relevant to a planning decision, stating:

"Considerations that may be relevant to determining a planning application include whether the development would:

- *Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*

- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;*

- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*

- *Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;*

- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."*

6 Planning Practice Guidance (PPG) 32. (2019). *Air Quality*. Available at: http://planningguidance.planningportal.gov.uk/blog/guidance/air-quality/.

2.15 Details are also provided of what should be included within an air quality assessment. Key considerations include:

- Baseline local air quality;
- Whether the proposed development could significantly affect local air quality during construction/operation; and
- Whether the development is likely to expose more people to poor air quality.

2.16 Examples of potential air quality mitigation measures are also provided in the PPG.

Local Planning Policy

2.17 MSDC's Local Plan comprises the adopted *Mid Sussex District Plan 2014-2031*[7], aimed at directing planning within the district up to 2031.

2.18 Core Policy DP29: *Noise, Air and Light Pollution*, from the *District Plan*, states the following:

"The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where: [...]

Air Pollution:

- *It does not cause unacceptable levels of air pollution;*
- *Development on land adjacent to an existing use which generates air pollution or odour would not cause any adverse effects on the proposed development or can be mitigated to reduce exposure to poor air quality to recognised and acceptable levels;*
- *Development proposals (where appropriate) are consistent with Air Quality Management Plans.*

2.19 In addition to this, Core Policy *DP39: Sustainable Design and Construction* further states:

"All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures:

7 Mid Sussex District Council. (2018). *Mid Sussex District Plan 2014-2031*. Available at: https://www.midsussex.gov.uk/media/3406/mid-sussex-district-plan.pdf

• Minimise energy use through the design and layout of the scheme including through the use of natural lighting and ventilation; [...]

• Use renewable sources of energy.

3. Methodology

Guidance

3.1 Defra's Local Air Quality Management Technical Guidance (LAQM.TG(16))[8] was followed in carrying out the assessment.

3.2 Guidance published by the IAQM[9] on the *'Assessment of Dust from Demolition and Construction'* was also used to assess the risk of dust emissions during the construction phase of the proposed development.

3.3 The Greater London Authority (GLA) Supplementary Planning Guidance[10] on the control of dust from construction has also been referred to, which is considered best practice guidance for the UK. It details a number of mitigation measures that should be adopted to minimise adverse impacts from dusts and fine particles.

3.4 The latest EPUK & IAQM guidance on *Planning for Air Quality*[11] was also referred to throughout the assessment.

3.5 MSDC is a member of the Sussex-Air Partnership, and so the *Air Quality and Emissions Mitigation Guidance for Sussex (2021)*[12] (AQEMGFS) has been followed in the emissions mitigation assessment.

Baseline Conditions

3.6 The baseline air quality conditions in the vicinity of the site are established through the compilation and review of appropriately sourced background concentration estimates and local monitoring data.

3.7 Defra provides estimated background concentrations of the UKAQS pollutants at the UK Air Information Resource (UK-AIR) website[13]. These estimates are produced using detailed modelling tools and are presented as concentrations at central 1km^2 National Grid square locations across the UK. At the time of writing, the most recent background maps were from August 2020 and based on monitoring data from 2018.

3.8 Being background concentrations, the UK-AIR data are intended to represent a homogenous mixture of all emissions sources within the general area of a particular grid square location.

8 Defra. (2021). Part IV of the Environment Act 1995, Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management, Technical Guidance LAQM. TG(16). London: Defra.
9 IAQM. (2014). *Guidance on the Assessment of Dust from Demolition and Construction*.
10 Greater London Authority. (2014). *The Control of Dust and Emissions During Construction and Demolition*.
11 EPUK & IAQM. (2017). *Land-Use Planning & Development Control: Planning for Air Quality*.
12 Sussex-Air (2021). *Air Quality and Emissions Mitigation Guidance for Sussex (2020).*
13 Defra: UK-AIR. www.uk-air.defra.gov.uk

3.9 Monitoring at background locations is considered an appropriate source of data for the purposes of describing baseline air quality. MSDC's monitoring data was reviewed to establish baseline air quality, with the most recent available data at the time of writing, from MSDC's[14] *2020 Air Quality Annual Status Report (ASR),* included and assessed.

Construction Phase

3.10 The construction phase of the proposed development will involve a number of activities that could potentially produce polluting emissions to air. Predominantly, these will be emissions of dust. However, they could also include releases of odours and/or more harmful gases and particles.

3.11 The IAQM's guidance to assess the impacts of construction on human and ecological receptors has been followed in carrying out this air quality assessment. The guidance suggests that where a receptor is located within 350m (50m for statutory ecological receptors) of a site boundary and/or 50m of a route used by construction vehicles, up to 500m from the site entrance, a dust assessment should be undertaken. High sensitivity receptors are considered particularly sensitive when located within 20m of a works area. Figure 2 shows receptors that could be sensitive to dust that are located within 350m of the boundaries of the site.

3.12 The Multi Agency Geographic Information for the Countryside (MAGIC) website[15], which incorporates Natural England's interactive maps, has been reviewed to identify whether any statutory ecological sensitive receptors are situated within 50m of the site boundary or within 50m of any routes used by construction vehicles on the public highway, up to 500m from the site entrance.

Construction Significance

3.13 The IAQM guidance suggests that Demolition, Earthworks, Construction and Trackout should all be assessed individually to determine the overall significance of the construction phase.

14 Mid Sussex District Council. (2021). *2021 Air Quality Annual Status Report.* Available at: https://www.midsussex.gov.uk/media/8021/2021-air-quality-annual-statement-status-report.pdf
15 Natural England and MAGIC partnership organisations. Multi Agency Geographic Information for the Countryside. http://www.magic.gov.uk/ (Accessed July 2021).

3.14 In the IAQM dust guidance, the first step in assessing the risk of impacts is to define the potential dust emission magnitude. This can be considered 'Negligible', 'Small', 'Medium' or 'Large' for each of the construction stages. Whilst the IAQM provides examples of criteria that may be used to assess these magnitudes, the vast number of potential variables mean that every site is different and therefore professional judgement must be applied by what the IAQM refer to as a "technically competent assessor". The construction phase assessment therefore relies on the experience of the appraiser.

3.15 As such, attempts to define precisely what constitutes a negligible, small, medium or large dust emission magnitude should be treated with caution. Factors such as the scale of the work, both in terms of size and time, the construction materials and the plant to be used must be considered.

3.16 The second step is to define the sensitivity of the area around the construction site. As stated in the IAQM guidance:

"the sensitivity of the area takes into account a number of factors:

- *the specific sensitivities of receptors in the area;*
- *the proximity and number of those receptors;*
- *in the case of PM_{10}, the local background concentrations; and*
- *site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust."*

3.17 Based on these factors, the area is categorised as being of 'Low', 'Medium' or 'High' sensitivity.

3.18 When dust emission magnitudes for each stage and the sensitivity of the area have been defined, the risk of dust impacts can be determined. The IAQM provides a risk of impacts matrix for each construction stage. The overall significance for the construction phase can then be judged from the stages assessed. Again, this is subject to professional judgement.

3.19 Combustion exhaust gases from diesel-powered plant and construction vehicles accessing the site will also be released. However, the volumes and periods over which these releases will occur are unlikely to result in any significant peaks in local air pollution concentrations and therefore this has been scoped out of the assessment.

Operational Phase

Road Transport Sources

3.20 Vehicle emissions will arise from the combustion of fossil fuels in vehicle engines and their subsequent release to atmosphere via tailpipe exhausts. The most significant pollutants released by cars and other vehicles are oxides of nitrogen (NO_2/NO_x) and particulate matter (PM_{10} and $PM_{2.5}$). Releases of carbon monoxide (CO) and some volatile hydrocarbons (e.g. benzene and 1,3-butadiene) are of less significance and are not assessed further in this report.

3.21 As it is elevated annual mean concentrations of NO_2 and PM_{10} that have resulted in the declaration of most AQMAs across the UK, these are the pollutants of most concern and they have therefore been the focus of this air quality assessment. $PM_{2.5}$, which is another fraction of particulate matter, has also been considered.

Roads Assessment

3.22 The latest EPUK & IAQM planning guidance[11] provides indicative thresholds for changes in traffic flows which would require a detailed air quality assessment, when not adjacent to an AQMA. These are a change in 24-hour average annual daily traffic (AADT) flows exceeding of 500 light duty vehicles (LDV) and/or 100 heavy duty vehicles (HDV). Changes below these thresholds can be reasonably considered to have an insignificant impact on air quality.

3.23 Traffic data provided by Paul Basham Associates stipulates that the proposed development will create traffic flows of 703 AADT once fully operational. This figure was modelled as a conservative, worse-case scenario, associated with the total traffic flow for 140 residential units. Given that the respective thresholds within the EPUK & IAQM guidance were exceeded on two road links, the B2116 Henfield Road (695 AADT) and the B2118 Southbound (511 AADT), detailed pollutant dispersion modelling will be undertaken so to ascertain the likely impacts of associated traffic emissions on local air quality.

Emissions Mitigation Assessment

3.24 Sussex-Air's Air Quality Planning Guidance[12] advocates that an emissions mitigation assessment (EMA) should be undertaken to outline how air quality impacts from developments emissions can be minimised.

3.25 The purpose of an EMA is to determine an 'appropriate scale and kind' of mitigation required from a development. An EMA sets out a methodology to assess the impact of a development emissions on air quality and provides an approach to mitigating emissions for developments, even those which have no significant impact on air quality.

3.26 As the proposed development is classified as 'Major', an EMA with an emissions cost calculation is required to be undertaken. The emissions cost calculation was undertaken following the Sussex AQEMGFS and Defra Damage Cost guidance[16], and utilised the latest Defra *Air quality damage cost appraisal toolkit*[17] in the assessment.

Emissions Cost Calculation

3.27 The emissions calculation utilised the latest Defra EFT (version 11.0)[16] to determine the total transport related emissions (NO_X & $PM_{2.5}$) that would be generated by the proposed development.

3.28 Defra provides *damage costs*, which are set of impact values, defined per tonne of pollutant for use in this calculation. Damage costs estimate the societal costs associated with changes in pollutant emissions and are then combined with the forecasted emissions changes to provide an approximation valuation of the cost (or benefit) to society caused by development.

3.29 Defra's Appraisal Toolkit[17], which incorporates the latest damage cost values, was used in the calculation. The principal of the calculation is summarised in the equation below:

EFT output x Damage costs x 5 years = 5 year exposure cost value (in £)

3.30 As a number of the inputs are based on assumptions, the resulting figure should be treated with caution, but it can be used to give an idea of the scale of a development in terms of total generated transport emissions and therefore a gauge of what level of mitigation might be appropriate.

3.31 It is usual for costs established in this way to be apportioned to low emission measures associated with a proposed development. In doing this it should be possible for damage costs to be offset.

Consultation

3.32 MSDC's Air Quality department was contacted on 25th March 2022 to discuss and agree the proposed scope of assessment. A response was received on Wednesday 30th March, with the proposed scope confirmed as acceptable:

"I confirm that the approach to assessing and mitigating emissions as you propose in your email is satisfactory."

16 Defra. (2021). Emission Factor Toolkit.
17 Defra. (2021). *Air quality damage cost appraisal toolkit.* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/980518/Air_Quality_Damage_Cost_Appraisal_Toolkit.ods

4. Baseline Assessment

4.1 This chapter is intended to establish prevailing air quality conditions in the vicinity of the development site.

UK-AIR Background Pollution

4.2 The UK-AIR[13] predicted background concentrations for NO_2, PM_{10} and $PM_{2.5}$ for 2019 to 2024 are presented in Table 4.1. These data were taken from the central grid square location closest to the application site (i.e. grid reference: 526500, 116500).

Table 4.1: 2019 to 2024 background concentrations of pollutants at the application site.

Pollutant	Predicted background concentration ($\mu g.m^{-3}$)						Averaging Period	Air quality standard concentration ($\mu g.m^{-3}$)
	2019	2020	2021	2022	2023	2024		
NO_2	11.5	11.0	10.5	10.0	9.6	9.1	annual mean	40
PM_{10}	14.9	14.6	14.4	14.3	14.1	13.9	annual mean	40
$PM_{2.5}$	9.5	9.3	9.2	9.0	8.9	8.7	annual mean	20

4.3 The data in Table 4.1 show that annual mean background concentrations of NO_2, PM_{10} and $PM_{2.5}$, in the vicinity of the application site between 2019 and 2024, were predicted to be well below their respective AQSs.

4.4 The data show that in 2022, NO_2, PM_{10} and $PM_{2.5}$ concentrations are predicted to be below their respective AQSs by 75.0%, 64.3% and 55.0% respectively. As such, annual mean background pollutant concentrations are likely to be below their respective AQSs at the application site.

4.5 Concentrations of all pollutants were predicted to decline each year. These reductions are principally due to the forecast effect of the roll out of cleaner vehicles, but also due to UK national and international plans to reduce emissions across all sectors.

Local Sources of Monitoring Data

4.6 Air quality monitoring is considered an appropriate source of data for the purposes of describing baseline air quality. At the time of writing, the most recent ASR released by MSDC[14] included local pollutant monitoring data from 2020.

4.7 Despite this, data from 2019 was chosen for analysis due to the heavy reductions in traffic flow numbers, and hence NO_2 concentrations, as a result of the onset of the COVID-19 Pandemic. This ensures a 'worse-case', conservative approach is maintained when analysing the potential impacts the proposed scheme may have on local air quality.

Automatic Monitoring

4.8 MSDC currently do not undertake any automatic (continuous) monitoring of NO_2, PM_{10} or $PM_{2.5}$ within their respective administrative boundary.

Non-Automatic Monitoring

4.9 MSDC operate an extensive network of non-automatic, NO_2 diffusion tube across the district. Therefore, the most recent available monitoring data for diffusion tubes located within 5.0km of the application site are included in Table 4.2, below.

Table 4.2: Monitoring data from MSDC's NO_2 Diffusion Tubes Within 5.0km of the Application Site

Monitor and AQMA	Type	Distance from the Site (km)	NO_2 annual mean concentration ($\mu g.m^{-3}$)			
			2017	2018	2019	2020
MSDC 26	S	1.9	23.9	23.6	21.5	16.1
MSDC 35	R	3.3	-	-	7.2	6.6
MSDC 19	RS	3.5	18.6	17.4	15.7	11.9
MSDC 27	S	3.6	20.5	22.8	19.3	13.6
MSDC 14	K	3.7	32.5	34.0	33.5	26.0
MSDC 15	K	3.7	35.1	35.1	34.0	26.0
MSDC 10	RS	3.7	38.8	**41.2**	39.4	28.4
MSDC 24	RS	3.7	23.1	24.0	22.9	17.8
MSDC 11c	RS	3.8	38.5	**40.1**	36.3	27.6
MSDC 23	RS	3.8	33.9	34.5	33.4	23.4
MSDC 16	RS	3.8	19.8	19.9	18.0	13.6
MSDC 18	K	3.8	29.5	28.1	29.3	17.9
MSDC 17	K	3.8	25.7	28.7	24.3	20.6
MSDC 12	K	3.8	33.7	33.5	33.9	23.9
MSDC 13	K	3.8	**43.8**	38.9	36.6	26.1

Note: "R" = Rural; "RS" = Roadside; "S" = Suburban; "K" = Kerbside.

4.10 The data in Table 4.2 show that annual mean concentrations of NO_2 at all monitored locations within 5.0km of the proposed development recorded concentrations below the $40\mu g.m^{-3}$ AQS in 2019.

4.11 Monitor MSDC 10, located kerbside to the Stonepound Crossroads and within the AQMA, recorded the highest mean annual NO_2 concentration in 2019 (39.4µg.m^{-3}); 1.5% below the respective AQS. Given this monitors location roadside to a major junction of strategic road links within the local area, unlike the prospective site boundary, NO_2 concentration levels here should not be considered representative of the conditions at the application site.

4.12 Monitor MSDC 19, located on the peri-urban periphery of the nearby town of Hassocks, recorded an annual mean NO_2 concentration of 15.7µg.m^{-3} in 2019; 60.8% below the respective AQS. Positioned roadside adjacent to the B2116 Hurst Road, conditions at this monitor should be considered most representative of the application site due to its peri-urban location, alongside a rural 'B' road link.

4.13 Between 2017 and 2020, the data recorded at MSDC's non-automatic diffusion tube monitors largely declined overall, with exceedances only recorded at monitors positioned adjacent to major road links.

5. Construction Phase Impacts

5.1 The construction phase of the proposed development will involve a number of activities that could produce polluting emissions to air. Predominantly, these will be emissions of dust.

5.2 The estimates for the dust emission magnitude for demolition, earthworks, construction and trackout below are based on the professional experience of Phlorum's consultants, information provided by the client and Google Earth imagery.

Dust Emission Magnitude

Demolition

5.3 The application site is a greenfield site and as such, demolition is not required for the proposed development. Demolition is, therefore, not considered further within this assessment.

Earthworks

5.4 The total site area is approximately 27.7 acres, which can be classified as *Large* with reference to the IAQM guidance. No details have been provided regarding the formation of bunds or the amount of earth to be moved.

5.5 As such, the overall dust emission magnitude for the earthworks stage has been based on the site area for conservative purposes and is considered to be *Large* with reference to IAQM guidance.

Construction

5.6 During construction, activities that have the potential to cause emissions of dust may include concrete batching, sandblasting and piling. Localised use of cement powder and general handling of construction materials also have the potential to generate dust emissions, as does the effect of wind-blow from stockpiles of friable materials.

5.7 The primary construction methods and materials to be utilised for the proposed development are currently unknown.

5.8 The proposed development is to have a construction volume of between 25,000m^3 to 100,000m^3, falling into the IAQMs *Medium* dust emission category for construction.

5.9 Therefore, with reference to the IAQM guidance, the overall dust emission magnitude for the construction phase is considered to be *Medium.*

Trackout

5.10 Construction traffic, when travelling over soiled road surfaces, has the potential to generate dust emissions and to also add soil to the local road network. During dry weather, soiled roads can lead to dust being emitted due to physical and turbulent effects of vehicles.

5.11 Given the size of the application site and its rural surroundings, unpaved road surfaces are expected be utilised throughout the construction phase. Furthermore, it is likely that these unpaved roads will be greater than 50m in length

5.12 As such, and with reference to the IAQM guidance, the dust emission magnitude for the trackout phase is considered to be *Large.*

Emission Magnitude Summary

5.13 A summary of the dust emission magnitude as a result of the activities of Demolition, Earthworks, Construction and Trackout as specified in the IAQM guidance, and discussed above, are listed in Table 5.1 below. Overall, the dust emission magnitude is considered to be *Large.*

Table 5.1: Dust Emission Magnitude for the construction activities, based on the IAQM's guidance

Activity	Dust Emission Magnitude
Earthworks	Large
Construction	Medium
Trackout	Large

Sensitivity of the Area

5.14 Having established the emission magnitudes for each phase above, the sensitivity of the area must be considered to establish the significance of effects. The effect of dust emissions depends on the sensitivity of each receptor.

5.15 High sensitivity human receptors include residential dwellings, schools and hospitals, but can include locations such as car showrooms when considering the impacts of dust soiling.

5.16 The impacts of dust emissions from the sources discussed above have the potential to cause an annoyance to human receptors living in the local area. Within distances of 20m of the site boundary there is a high risk of dust impacts, regardless of the prevailing wind direction. Up to 100m from the construction site, there may still be a high risk, particularly if the receptor is downwind of the dust source.

5.17 With the exponential decline in dust with distance from dust generating activities, it is considered that for receptors more than 350m from the site boundary, the risk is negligible. Furthermore, the risks at over 100m only have the potential to be significant in certain weather conditions, e.g. downwind of the source during dry periods.

5.18 The approximate number of high sensitivity human receptors in the vicinity of the site is detailed in Table 5.2 below and shown in Figure 2.

Table 5.2: Approximate number of High Sensitivity Receptors close to the site

Distance to site (m)	Approximate number of receptors	Receptor Details
<20	184*	Residential dwellings, Albourne CofE Primary School
<50	200*	Residential dwellings, Albourne CofE Primary School
<100	240*	Residential dwellings, Albourne CofE Primary School
<350	Approx. 350*	Residential dwellings, Albourne CofE Primary School

Note: * includes approximate number of pupils / residents at local institutions.

5.19 Figure 3 shows that the predominant wind direction at the closest relevant meteorological station at Charlwood (2019) is from the south-west. As shown in Figure 2, there are several high sensitivity receptors in close proximity to the application site. As such, the sensitivity of the area to dust soiling impacts is defined as *High.*

5.20 UK-AIR predicted annual mean concentrations of PM_{10} are below 24µg.m^{-3} at the site. This provides a good indication that PM_{10} concentrations for both annual mean and daily mean concentrations are likely to be below the respective AQSs at the site and adjacent uses. Therefore, the sensitivity of the area to human health impacts is defined as *Low*.

5.21 Review of the MAGIC website[15], which incorporates Natural England's interactive maps, has identified no statutory ecological receptors within 50m of the site, or 50m of roads to be used by construction traffic, up to 500m from the site entrance. The closest statutory ecological site is the boundary of the Wolstonbury Hill (SSSI) located approximately 2.9km to the south-east of the site. Therefore, the construction of the proposed development can be considered to have a *Negligible* impact on local ecological sites.

Risk of Impacts

5.22 Having established the potential dust emission magnitudes and sensitivity of the area, the risk of impacts can be determined in accordance with the IAQM guidance. These are summarised in Table 5.3.

Table 5.3: Summary of Impact Risk by Construction Stage based on the IAQM's dust guidance

Stage	Impact Risk		
	Nuisance Dust	Ecology	PM_{10}
Earthworks	High	Negligible	Low
Construction	Medium	Negligible	Low
Trackout	High	Negligible	Low

5.23 Overall, and for conservative purposes, the proposed development is considered to be *High Risk* for nuisance dust soiling effects, *Low* for PM_{10} health effects and to be *Negligible* for ecology, in the absence of mitigation.

Site Specific Mitigation

5.24 The GLA guidance[10] suggests a number of mitigation measures that should be adopted in order to minimise impacts from dusts and fine particles. Appropriate measures that could be included during construction of the proposed development include:

- ideally cutting, grinding and sawing should not be conducted on-site and pre-fabricated material and modules should be brought in where possible;
- where such work must take place, water suppression should be used to reduce the amount of dust generated;
- skips, chutes and conveyors should be completely covered and, if necessary, enclosed to ensure that dust does not escape;
- no burning of any materials should be permitted on site;
- any excess material should be reused or recycled on-site in accordance with appropriate legislation;
- developers should produce a waste or recycling plan;
- following earthworks, exposed areas and soil stockpiles should be re-vegetated to stabilise surfaces, or otherwise covered with hessian or mulches;

- stockpiles should be stored in enclosed or bunded containers or silos and kept damp where necessary;
- hard surfaces should be used for haul routes where possible;
- haul routes should be swept/washed regularly;
- vehicle wheels should be washed on leaving the site;
- all vehicles carrying dusty materials should be securely covered; and
- delivery areas, stockpiles and particularly dusty items of construction plant should be kept as far away from neighbouring properties as possible.

5.25 In addition, the IAQM lists recommended mitigation measures for low, medium and high Dust Impact Risks. The highly recommended mitigation measures for *High Risk* sites are included in Appendix A of this report.

5.26 Where dust generation cannot be avoided in areas close to neighbouring properties, additional mitigation measures should be put in place, such as: windbreaks, sprinklers, and/or time/weather condition limits on the operation of some items of plant or the carrying out of activities that are likely to generate a particularly significant amount of dust.

Residual Effects

5.27 After the implementation of the mitigation measures listed above and in Appendix A, the significance of each phase of the construction programme will be reduced and the residual significance of impact for the construction phase is expected to be *Negligible*.

6. Operational Phase Impacts

Operational Phase

6.1 The latest EPUK & IAQM planning guidance[11] provides indicative thresholds for changes in traffic flows which would require a detailed air quality assessment, when not close to an AQMA. These are a change in 24-hour AADT flows exceeding 500 LDVs and/or 100 HDVs. Changes below these thresholds can be reasonably considered to have an insignificant impact on air quality.

6.2 Traffic data provided by the transport consultants for the project, Paul Basham Associates, show that the proposed development is expected generate AADT flows of 703, of which 5% is predicted to be HDVs. Approximately, 695 vehicles are expected to travel east along the B2116 Henfield Road, further splitting northbound (184 AADT flows) and southbound on the B2118 (511 AADT flows). Given that predicted flows are in exceedance of the EPUK & IAQM guidance on both the B2116 Henfield Road and the B2118 (Southbound), detailed modelling is currently being undertaken to assess whether traffic from the proposed development, once operational, will have a significant impact on local air quality.

6.3 It should be noted however, that existing pollutant concentrations within the vicinity of the application site and within the village of Albourne itself are expected to be well below the relevant AQSs. As such, there is likely to be capacity for the traffic flows associated with the development to not significantly impact local air quality.

Site Suitability

6.4 LAQM.TG (16) guidance[8] (Tables 7.7 and 7.8) sets out the classification of monitoring locations and where these are in relation to sources of pollution. The guidance states that an *Urban background* location is, as follows:

"An urban location distanced from sources and therefore broadly representative of city-wide background conditions, e.g. urban residential areas."

6.5 The AEA *Diffusion Tube for Ambient NO_2 Monitoring: Practical Guidance*[18] (AEA guidance) provides further detailed definitions which help to classify urban background sites. Specifically, Section 3.2.2 states that, where a site meets the following criteria, they can be reasonably defined as being in an urban background location, away from adverse impacts associated with emissions from road sources:

18 AEA Energy and Environment (2008). *Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for Laboratories and Users*.

- >50m from any major source of NO_2 (e.g. multi-storey car parks);
- >30m from any '*very busy*' road (>30,000 vehicles per day);
- >20m from a '*busy*' road (10,000 – 30,000 vehicles per day);
- >10m from any '*main*' road; and
- >5m from locations where vehicles may stop with their engines idling

6.6 The main sources of air pollution in the vicinity of the application site are vehicles travelling on the nearby B2116 Henfield Road. DfT[19] conducted manual traffic counts on the B2116 Henfield Road (adjacent to the application site boundary), with the latest data stating that in 2019, AADT flows equalled 3,147.

6.7 As sensitive uses proposed at the development site are distanced approximately 10m from the B2116 Henfield Road at its closest point, with reference to the above criteria, all proposed sensitive uses can be considered to be set in an urban background location.

6.8 Following LAQM.TG(16) guidance, it is expected that pollutant concentrations across the application site would likely be similar to other locations identified as urban background sites within MSDC's authoritative boundaries. However, MSDC do not conduct any air quality monitoring within an urban background setting. The most representative monitor of baseline conditions at the site of the proposed development, diffusion tube MSDC 19, recorded average annual pollutant concentrations well below the respective AQS in 2019 (by 60.8%).

6.9 UK-AIR estimates of background concentrations in the vicinity of the application site suggest that concentrations of NO_2, PM_{10}, and $PM_{2.5}$ are likely to be well below the relevant long and short-term AQSs and decreasing further in future years. Therefore, the proposed development is anticipated to be suitable, in air quality terms, for the introduction of new, sensitive receptors, and no further assessment of site suitability is required.

Department for Transport. (2022). *Traffic Count ID: 809097*.

7. Emissions Mitigation Assessment

Emission cost calculation

7.1 Following the March 2021 update to Defra's emissions cost calculation guidance, the emissions cost calculation below has been carried out to estimate the value of the impact of NO_x and $PM_{2.5}$ emitted as a result of the proposed development.

7.2 To evaluate the scale of a proposed development's total emissions, Defra recommends an emissions cost calculation using the following formula:

Road Transport Emission Increase (Cost, £) =

Estimated trip rate for 5 years × Emission Rate/10km/vehicle type × Damage Costs

7.3 The latest Defra Emissions Factor Toolkit[20] was used to determine the total transport related emissions that would be generated by the proposed development; the inputs used in the calculation are shown in Table 7.1.

Table 7.1: Calculation Inputs

Input	Value	Unit	Source/Guidance
Trip Length	10	km	AQEMGFS
Net Traffic Flow	703 AADT (5% HDV)	AADT	Transport Consultant (Paul Basham Associates)
EFT Road Type	Urban (not London)	-	EFT
EFT Year	2025 – 2029	-	Opening year + 4 years (In line with EFT estimates)
Average Speed	50	$km.hr^{-1}$	AQEMGFS
Appraisal period	5	years	AQEMGFS

7.4 The total emission 'damage' cost was calculated using Defra's appraisal toolkit and is presented in Tables 7.2 and 7.3.

7.5 The calculation accounts for an 'uplift factor' of 2% cumulatively per annum and a 'discount rate', in line with the latest 2021 guidance[16]. Central estimate damage costs for '*Road Transport Urban Small*" were based on Defra 2021 prices.

20 DEFRA. (2021). *Emissions Factor Toolkit V11.0.*

Table 7.2: Emission Cost Calculation for NO_x

	2025	2026	2027	2028	2029
NO_X increase (tonnes)	0.4678	0.4194	0.3755	0.3373	0.3051
Central Damage cost (NO_X)	£8,063	£8,225	£8,389	£8,557	£8,728
Adjusted Damage cost (NO_X)	£3,772	£3,333	£2,940	£2,603	£2,321
Total			**£14,970**		

Table 7.3: Emission Cost Calculation for $PM_{2.5}$

	2025	2026	2027	2028	2029
$PM_{2.5}$ increase (tonnes)	0.0510	0.0507	0.0505	0.0503	0.0502
Central Damage cost ($PM_{2.5}$)	£71,949	£73,388	£74,856	£76,353	£77,880
Adjusted Damage cost ($PM_{2.5}$)	£3,669	£3,594	£3,525	£3,463	£3,404
Total			**£17,655**		

7.6 The total damage costs are summarised as follows:

NO_X emission 'damage' (cost, £) = £14,970 +

$PM_{2.5}$ emission 'damage' (cost, £) = £17,655

TOTAL (Cost, £) = £32,625

Mitigation

7.7 The resulting value of the 'emissions cost', as calculated above, is indicative of the value of an appropriate package of mitigation to offset any potential impacts from the proposed development. The mitigation package should at least equate to this 'emissions cost'.

7.8 For all residential developments considered as 'Major' under the AQEMGFS[12], the following mitigation measures should be included as a minimum:

- all gas-fired boilers are expected to meet a minimum standard of <40mgNO_x/kWh, with consideration given to renewable energy sources;

- meet electric vehicle (EV) charging point guidance set out in West Sussex County Council's *Guidance on Parking at New Developments*[21].

7.9 Numerous mitigation methods have been committed to by the client, including the provision of electric vehicle charging points (EVCP). As per *The Building Regulations 2010: Part S - Infrastructure for the Charging of Electric Vehicles* (2021)[22], it is required that for each dwelling with associated parking, one standard 'active' EV charging point should be installed. Each of the remaining car parking spaces should be connected with ducting, providing a 'passive' provision for future electric vehicle charging.

7.10 Based on the number of proposed residential units, the installation of the aforementioned EVCP's will likely offset the entirety of the generated 'damage cost'.

7.11 As stated within the scheme's *Energy Strategy*[23], the energy, heating and hot water strategy will not involve the use of any combustion sources and no gas will be provided on site. Instead, an energy strategy comprising the use of Air Source Heat Pumps (ASHP) has been proposed.

7.12 In addition to this, numerous other mitigation measures have been proposed by the developer, including the following:

- A travel plan, with mechanisms to discourage high emission vehicle use and low emission technologies;
- Cycle storage; and
- The use of green infrastructure (for instance, the planting of trees) to absorb dust and other pollutants.

7.13 Over the 5-year period assessed, the above list of mitigation measures is anticipated to cost well in excess of the calculated **£32,625** emissions cost. As such, the proposed development is considered to include a reasonable level of air quality mitigation to minimise its impacts.

21 West Sussex County Council. (2020). *Guidance on Parking at New Developments*. Available at: https://www.westsussex.gov.uk/media/1847/guidance_parking_res_dev.pdf
22 HM Government. (2021). *The Building Regulations 2010: Part S – Infrastructure for the Charging of Electric Vehicles*.
23 Energist. (2022). *Energy Statement*,

8. Discussion

Construction Phase Impacts

8.1 The construction phase of the development could give rise to emissions which could cause dust soiling effects on adjacent uses. Following the IAQM guidance, the construction phase of the development can be considered to be *High Risk* for nuisance dust soiling effects, *Low* for PM_{10} health effects and to be *Negligible* for ecology, in the absence of mitigation.

8.2 Following the implementation of the mitigation measures provided in Appendix A and listed in Section 5.24, emissions from the construction programme will be reduced and the residual significance of impact for the construction phase is expected to be reduced to *Negligible*, thus complying with the requirements of the NPPF.

Operational Phase Impacts

8.3 The need for a detailed pollutant dispersion modelling assessment of the proposed development's sensitivity to local air quality has been screened out using Defra and AEA guidance, along with review of local pollutant monitoring data. This was primarily due to the site being located in an area distanced from any major sources of pollution and background concentrations being anticipated to be well below the AQSs. Therefore, the site is considered to be suitable, in air quality terms, for the proposed residential use, and no further assessment of site suitability is considered necessary.

8.4 Due to exceedances of the indicative screening thresholds prescribed by the EPUK & IAQM planning guidance, a detailed dispersion modelling assessment of the proposed development's impact on local air quality is currently being undertaken.

Emissions Mitigation Assessment

8.5 The Sussex-air emissions mitigation guidance requires an Emissions Mitigation Assessment for all *Major* classified developments, to help minimise the potential for incremental impacts on local air quality.

8.6 Following Defra's latest Damage Cost guidance and guidance from the Sussex-air partnership, an 'emissions cost' of **£32,625** was calculated as a result of NO_x and $PM_{2.5}$ emissions expected to be generated by traffic associated with the scheme, in its first five operational years.

8.7 Current plans to offset potential air quality impacts include the provision of EVCP in line with national and local policy, provision of cycle storage facilities, use of ASHPs for heating and hot water generation, implementation of a Travel Plan, and the planting of green infrastructure. It is anticipated that the proposed mitigation measures are likely to offset the calculated 'Damage Cost'.

9. Conclusions

9.1 Croudace Homes Limited commissioned Phlorum Limited to undertake an Air Quality Assessment to support an outline planning application for a residential development on Land at Henfield Road, Albourne (BN6 9DH). The proposals comprise the development up to 120 residential units, with the provision of a community orchard and associated parkland.

9.2 UK-AIR background concentrations and local air quality monitoring results from the wider area suggest that air quality within the vicinity of the application site is good, with background pollution concentrations across the site likely to be below the relevant UK Air Quality Standard concentrations.

9.3 The construction phase of the development could give rise to emissions which could cause dust soiling effects on adjacent uses. However, by adopting the appropriate mitigation measures to reduce emissions and their potential impact, there should be no significant residual effects, thus complying with the requirements of the National Planning Policy Framework.

9.4 Due to the projected traffic flows associated with the proposed development, further modelling is currently being undertaken to establish whether traffic-related emissions associated with the development will significantly impact local, existing sensitive receptors.

9.5 To mitigate for future emissions, the development will include mitigation measures, as listed in Section 6 of this report. It is anticipated that these measures include a reasonable level of air quality mitigation to offset the development's calculated 'Damage Cost'.

Figures and Appendices

Figure 1: Site Location Plan

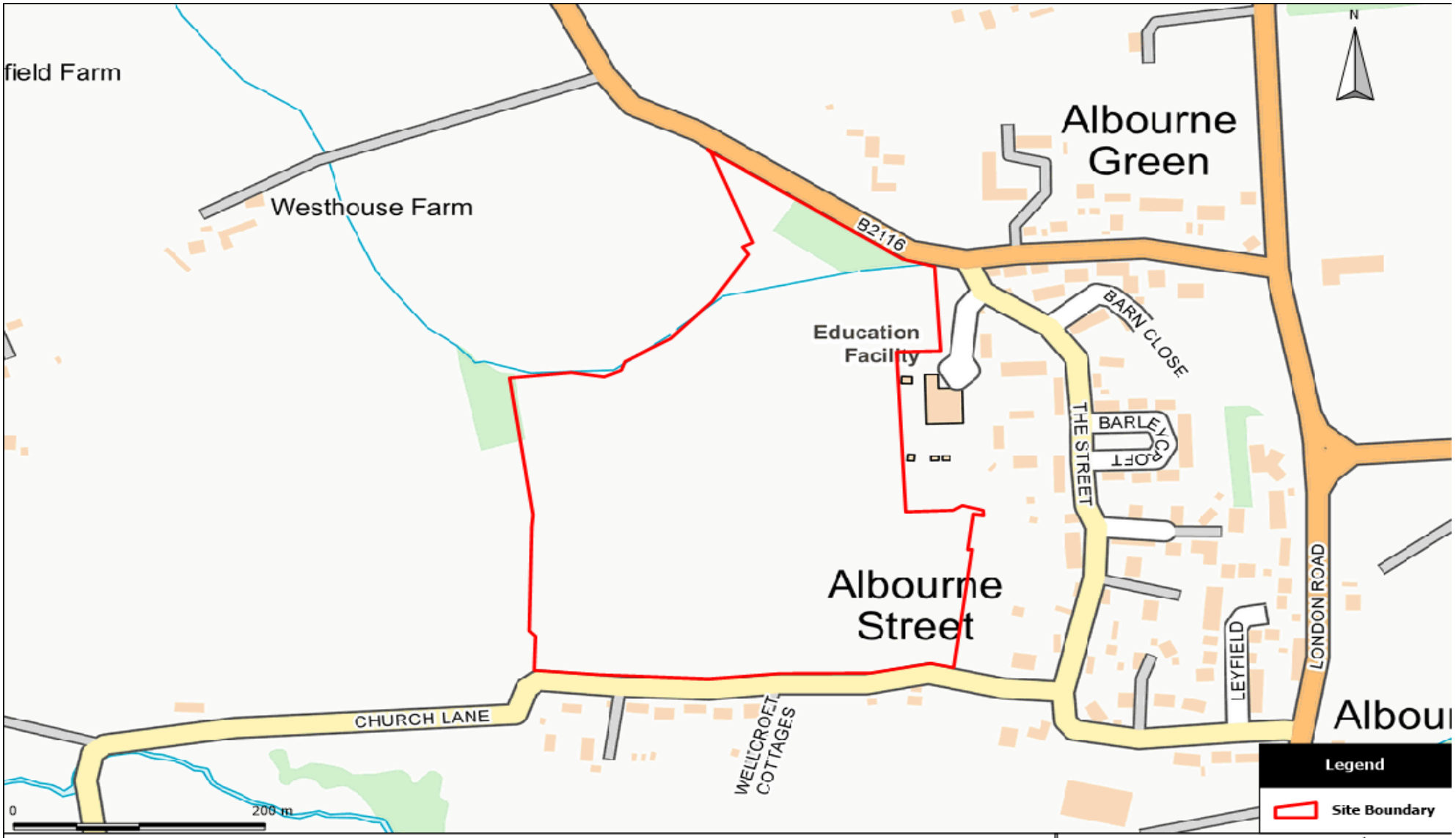

Figure 1: Site Location Plan

Job No:11238
Drawn by: MB
Printed at: 11/04/2022
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Figure 2: Construction Phase Receptors

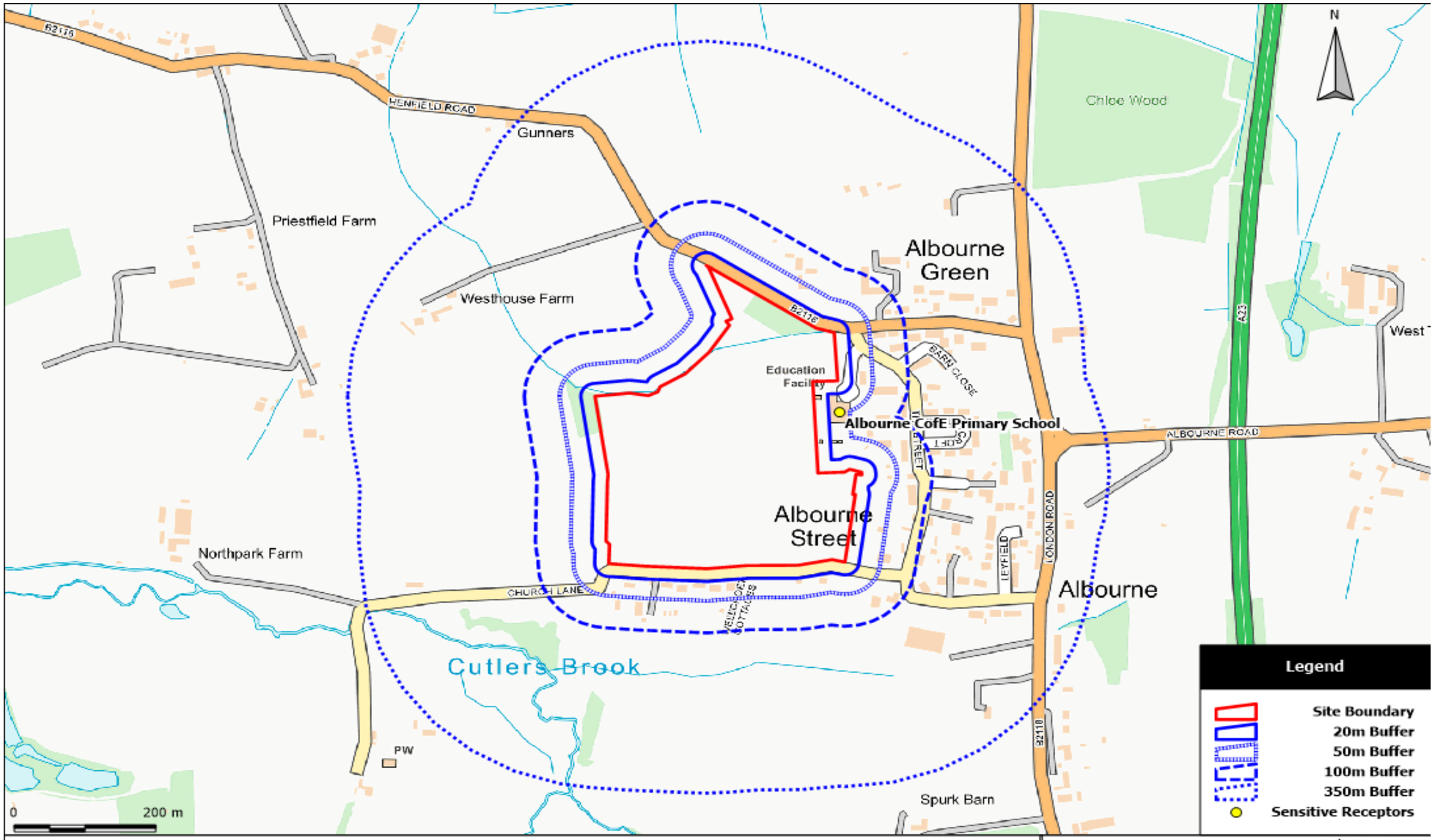

Figure 2: Construction Phase

Job No: 11282
Drawn by: MB
Printed at: 11/04/2022
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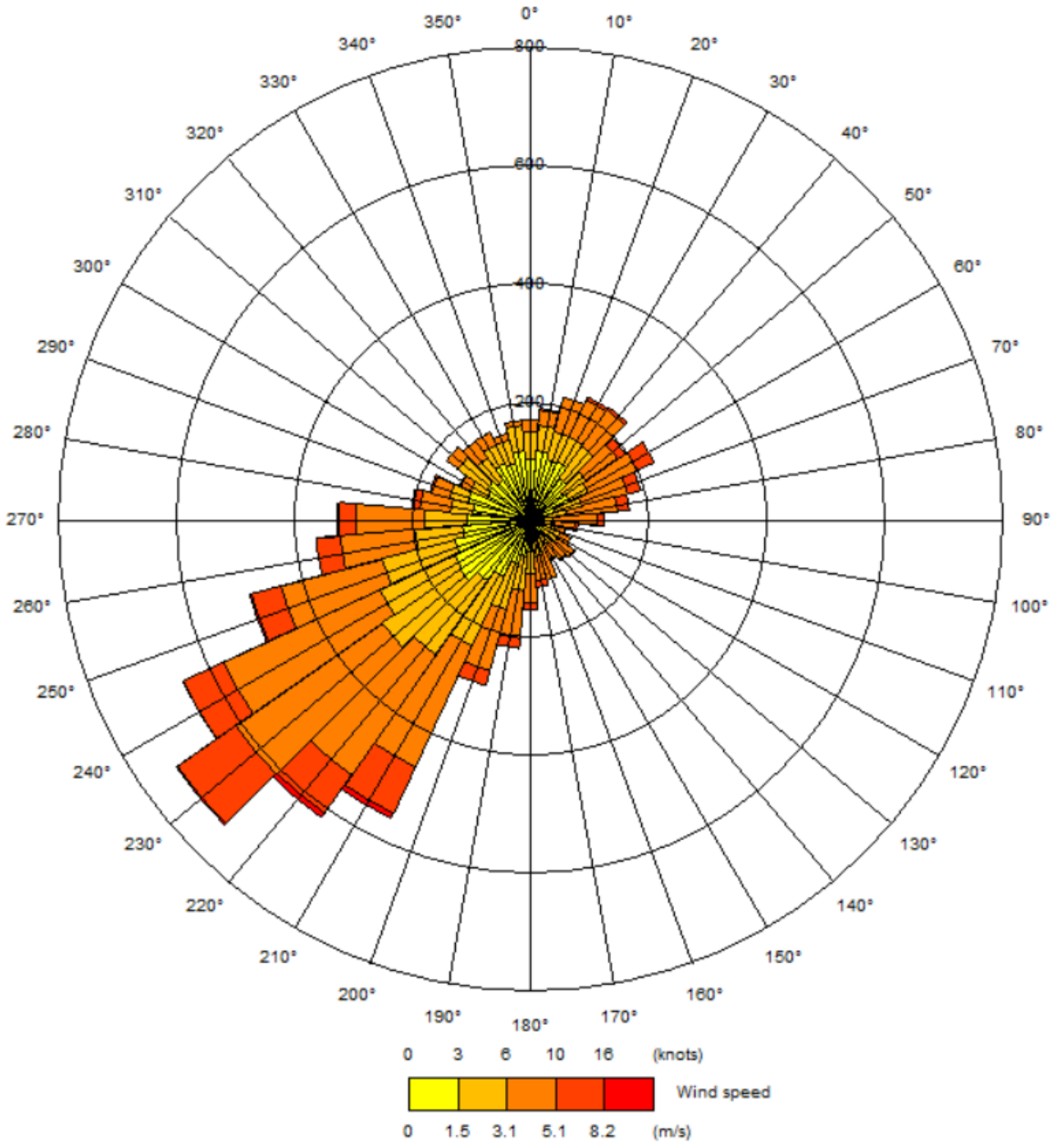
Figure 3: Wind Rose for Charlwood Meteorological Station (2019)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260°
270°
280°
290°
300°
310°
320°
330°
340°
350°
800
600
400
200
0 3 6 10 16 (knots)
Wind speed
0 1.5 3.1 5.1 8.2 (m/s)

Appendix A: IAQM Highly Recommended Mitigation Measures for High Risk Sites

Appendix A: IAQM Highly Recommended Mitigation Measures for sites with a High Risk of Dust Impacts

Please refer to the IAQM's *Guidance on the assessment of dust from demolition and construction (2014)*[9] and *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites (2018)*[24] for further, "desirable", mitigation measures.

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 Appendix. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.

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 exception incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook. Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. If the site is within a large AQMA (i.e. larger than 500m from the site), this should be extended to include all other high risk construction sites within the AQMAs. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

Monitoring

- Carry out regular site inspections to monitor compliance with the Dust Management Plan, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of 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

24 IAQM. (2018). Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites. https://iaqm.co.uk/text/guidance/guidance_monitoring_dust_2018.pdf

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 the 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 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.
- 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.
- Implement a travel plan that supports and encourages sustainable staff travel (public transport, cycling, walking, and car-sharing).
- Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unpaved 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.
- 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 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.
- Only use registered waste carriers to take waste off-site.

Demolition

- Soft stirp 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. 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.

Earthworks

- Re-vegetate earthworks and exposed areas/oil 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 a small area during work and not all at once.

Construction

- Avoid scabbing 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 power materials ensure bags after 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.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.

- Record all inspections of haul routes and any subsequent action in a site logbook.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10m from receptors where possible.

Phlorum Limited

Head Office & Registered Office:
Unit 12
Hunns Mere Way
Woodingdean
Brighton
East Sussex
BN2 6AH
T: 01273 307 167

Northern Office:
Ground Floor
Adamson House
Towers Business Park
Wilmslow Road
Didsbury
Manchester
M20 2YY
T: 0161 955 4250

Western Office:
One Caspian Point
Pierhead Street
Cardiff Bay
Cardiff
CF10 4DQ
T: 029 2092 0820

info@phlorum.com
www.phlorum.com

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