



Air Quality Assessment

Hampton Quay, Littlehampton

August 2020

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1. Introduction

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- 1.1 Phlorum Ltd has been commissioned by Stolon Studio Ltd to undertake an Air Quality Assessment (AQA) for the Proposed Development at Hampton Quay, Littlehampton (BN17 5RA). The National Grid Reference for the centre of the Application Site is 501550, 102670. A site location plan is included in Figure 1.
 - 1.2 It is understood that proposals are for an outline planning application for the development of 105 residential units, approximately 330m² of commercial use and 20 moorings across the river.
 - 1.3 The Site is bound by the River Arun to the west and Bridge Road Roundabout (A259) to the east. The main sources of air pollution in the vicinity of the Application Site are vehicles travelling on the local road network, particularly the A259. The Riverside Industrial Site is also approximately 100m from the Application Site, so shall be given due consideration within the report.
 - 1.4 Arun District Council (ADC) has no Air Quality Management Areas (AQMA) in the district, as the annual mean UK Air Quality Standards (AQSS) for nitrogen dioxide (NO₂), particulate matter (PM) and other pollutants have been consistently met.
 - 1.5 Nonetheless, a focus of this report will be to qualitatively assess potential air quality impacts of traffic generated from the Proposed Development. The report will also assess the potential for new receptors to be exposed to an area of existing poor air quality, due to the Application Site's proximity to the A259.

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

Pollutant	Averaging Period	Air quality standard (AQS) ($\mu\text{g.m}^{-3}$)	Air quality objective	Objective: to achieve the standard by
Nitrogen dioxide (NO_2)	1 hour	200	200 $\mu\text{g.m}^{-3}$ not to be exceeded more than 18 times a year	31 December 2005
	Annual	40	40 $\mu\text{g.m}^{-3}$	31 December 2005
Particulate Matter (PM_{10})	24 hour	50	50 $\mu\text{g.m}^{-3}$ not to be exceeded more than 35 times a year	31 December 2004
	Annual	40	40 $\mu\text{g.m}^{-3}$	31 December 2004

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

Particulate Matter (PM _{2.5})	Annual	25	25 µg.m ⁻³	2020
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- 2.4 The objectives adopted in the UK are based on the Air Quality (England) Regulations 2000², 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 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.
- 2.6 ADC has not declared any AQMAs, so no AQAP has been produced.

National Planning Policy Framework

- 2.7 The National Planning Policy Framework (NPPF)³, which was updated in July 2019, 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". In achieving this, it states in paragraph 170 that:

"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 [...]"

- 2.8 With regard to assessing cumulative effects the NPPF states the following at paragraph 180:

"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."

2 The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043.

3 Department for Communities and Local Government (DCLG), (2019), National Planning Policy Framework.

2.9 Regarding compliance with relevant limit values and national objectives for pollutants the NPPF, paragraph 181 states:

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

2.10 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

2.11 Reference ID 32 (Air Quality) of the National Planning Practice Guidance (PPG)⁴, 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.

2.12 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*

4 Planning Practice Guidance (PPG) 32. (updated Nov 2019). Air Quality.
<http://planningguidance.planningportal.gov.uk/blog/guidance/air-quality/>.

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.”*

2.13 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.

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

Local Planning Policy

2.15 In 2018, ADC produced their Local Plan⁵, stipulating the visions, objectives and policies to improve the local area. The following policies are of relevance to air quality:

⁵ ADC (2018). Adoption Arun Local Plan 2011-2031.

2.16 Policy QE SP1 – Quality of the environment, states:

“The Council requires that all development contributes positively to the quality of the environment and will ensure that development does not have a significantly negative impact upon residential amenity, the natural environment or upon leisure and recreational activities enjoyed by residents and visitors to the District.

The location of existing industrial and commercial uses, including waste management uses, must be taken into consideration when assessing proposals for development sensitive to noise, light, odour and outputs to air. This is to ensure that land allocated for these uses are protected and to ensure that the amenity of new developments and facilities is safeguarded from the impacts of incompatible land uses.”

2.17 Policy QE DM3 – Air Pollution, states:

“All major development proposals will be required to assess the likely impacts of the development on air quality and mitigate any negative impacts by:

- ❖ Ensuring the development is located within easy reach of established public transport services;*
- ❖ Maximising provision for cycling and pedestrian facilities;*
- ❖ Encouraging the use of cleaner transport fuels on site, through the inclusion of electric car charging points; and*
- ❖ Contributing towards the improvement of the highway network where the development is predicted to result in increased congestion on the highway network.*

Development proposed nearby any Air Quality Management Area (AQMA) declared within the District within the Plan period, will require an air quality assessment to identify likely impacts of development upon the designated area. Developers will be required to ensure delivery of the actions set out within any Air Quality Action Plan.(...)

Developments shall also be consistent with all other Local Plan policies.”

2.18 Policy EMP SP3 – Strategic Land Allocations puts job creation at the core of the Local Plan, but the policy insists that allocations will *“need to be developed with consideration and enhancement of landscape character, designated and other protected habitats and species, air and water quality.”*

2.19 Policy H SP2b – Greater Littlehampton Urban Area – West Bank (SD4) discusses plans to provide at least 1,000 dwellings to Littlehampton to regenerate economic growth. It states that developments must protect and improve the adjoining environment and habitats, in respect of the water and air environments serving them.

2.20 Policy T SP1 – Transport and Development, stipulates that the council will support transport and development which:

- ❖ *"[...] incorporates appropriate levels of parking in line with West Sussex County Council guidance on parking provision and the forthcoming Arun Design Guide taking into consideration the impact of development upon on-street parking and [...]"*

- ❖ *Explains how the development has been designed to:*

- *accommodate the efficient delivery of goods and supplies;*
- *give priority to pedestrian and cycle movements and have access to high quality public transport facilities;*
- *create safe and secure layouts for traffic, cyclists and pedestrians whilst avoiding street clutter;*
- *incorporate facilities for charging electric and plug-in hybrid vehicles (where charging facilities are to be omitted from the development, evidence of market demand and viability must be provided); and*
- *consider the needs of people with disabilities by all modes of transport."*

2.21 The West Sussex Transport Plan (2011-2026)⁶ is a core text from which Policy T SP1 was based. Within this are a set of strategies and aims to improve the regional transport system. For Arun, a key aim is to:

"Encourage the use of cleaner vehicles such as electric cars, by for example providing electric recharging posts and recharging bays in partnership with the District Council as part of a wider network available to all users of electric vehicles."

⁶ WSCC (2011). West Sussex Transport Plan (2011-2026).

- 2.22 Lastly, the recently approved West Sussex Electric Vehicle Strategy (2019 - 2030)⁷ is introducing new electric vehicle recharging infrastructure thresholds for new developments. WSCC states that the strategy is to provide infrastructure as it predicts:

"70% of all new cars in the county to be electric by 2030, but as a minimum we want to see at least 50% electric".

⁷ WSCC (2019). Electric Vehicle Strategy 2019-2030.

3. Assessment Methodology

Guidance

- 3.1 The Defra LAQM Technical Guidance (LAQM.TG(16))⁸ was followed in carrying out the assessment. Guidance published by the IAQM⁹ on the 'Assessment of Dust from Demolition and Construction' was also used when assessing the construction phase of the Proposed Development. The Greater London Authority (GLA) Supplementary Planning Guidance¹⁰ 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.
- 3.2 The latest Environmental Protection UK (EPUK) & IAQM guidance on 'Planning for Air Quality'¹¹ was also referred to for screening the requirements for detailed pollution modelling within this assessment.
- 3.3 ADC is also a participating member of the Sussex-air partnership, and fully encourages developments to comply with the guidance set out in the 'Air Quality and emissions mitigation guidance for Sussex (2020)'¹² (AQEMGFS). This has been followed alongside West Sussex County Council's Parking Guidance¹³, within the emissions mitigation assessment.

Baseline

- 3.4 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.
- 3.5 Defra provides estimated background concentrations of the UKAQs pollutants at the UK Air Information Resource (UK-AIR) website¹⁴. These estimates are produced using detailed modelling tools and are presented as concentrations at central 1km² National Grid square locations across the UK. At the time of writing, the most recent background maps were from May 2019 and based on monitoring data from 2017.

8 Defra. 2018. 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 (2020). Air Quality and emissions mitigation guidance for Sussex (2020).

13 WSCC (2019). West Sussex County Council Guidance on parking at New Developments.

14 Defra: UK-AIR. www.uk-air.defra.gov.uk

- 3.6 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. Concentrations of pollutants at various sensitive receptor locations can, therefore, be calculated by modelling the emissions from a nearby pollution source, such as a busy road, and then adding this to the appropriate UK-AIR background datum.
- 3.7 ADC diffusion tube monitoring data were reviewed to establish baseline air quality. The most recent available data from ADC's annual status report¹⁵ have been included and assessed.

Construction Phase

- 3.8 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.
- 3.9 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.
- 3.10 The Multi Agency Geographic Information for the Countryside (MAGIC) website¹⁶, which incorporates Natural England's interactive maps, has been reviewed to identify whether 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

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

15 Arun District Council (2019). LAQM Air Quality Annual Status Report 2019.

16 Natural England and MAGIC partnership organisations. Multi Agency Geographic Information for the Countryside.
<http://www.magic.gov.uk/> (accessed July 2019).

- 3.12 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.
- 3.13 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.
- 3.14 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 PM₁₀, 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."*

- 3.15 Based on these factors, the area is categorised as being of 'Low', 'Medium' or 'High' sensitivity.
- 3.16 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.
- 3.17 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

- 3.18 The latest EPUK & IAQM planning guidance¹¹ provides indicative thresholds for changes in traffic flows which would require a detailed air quality assessment when not in proximity to an AQMA. These are a change in 24-hour average annual daily traffic (AADT) flows 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.
- 3.19 Traffic data provided by Odyssey, the Transport Consultants for the scheme, shows that the Proposed Development is expected to generate approximately 639 daily vehicular trips (AADT). These vehicles immediately dissipate on the local road network, with 201 vehicles travelling on the B2187 Bridge Road, 236 south on the A259 and 202 north on the A259. This is below the threshold for requiring a detailed air quality impact assessment on any given road. Traffic generated by the Proposed Development is, therefore, unlikely to have a significant impact upon air quality. As such, there is no need to assess the impacts of pollution generated by the Development's traffic on local air quality.
- 3.20 Furthermore, the Proposed Development is unlikely to introduce new receptors into an area of existing poor air quality. As is discussed in Section 4 of this report, NO₂ concentrations across the Littlehampton road network are currently well below the relevant AQS. With this in mind, and considering that the dense green infrastructure between Application Site and A259 will act as a barrier from roadside emissions, pollutant concentrations should be well below relevant AQSs at the Site. This is further supported by the distance between the roadside and expected nearest residence. Utilizing guidance set out within LAQM.TG(16)⁸ and the AEA 'Diffusion Tube for Ambient NO₂ Monitoring: Practical Guidance' document¹⁷, it is considered that annual mean pollutant concentrations at the Proposed Development would be approaching the background levels discussed in Section 4 of this report. Background concentrations are well below their respective AQSs.
- 3.21 As such, it is considered that the Proposed Development will not introduce any new receptors into an area of poor air quality, and the need to assess this in further detail has been screened out.

17 AEA Energy and Environment (2008). Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance for Laboratories and Users.

Emissions Mitigation Assessment

- 3.22 The purpose of an emissions mitigation assessment (EMA) is to determine an 'appropriate level' of mitigation required from a development. They are an alternative way to assess the impact of a development on air quality and they ensure that all developments, even those which have no significant impact on air quality, include appropriate mitigation to offset their potential impact.
- 3.23 At the request of ADC, this assessment follows the methodology set out in the latest Sussex-Air emissions guidance¹².
- 3.24 With reference to Screening Checklist 2, the Proposed Development is classified as 'Major', as it is to provide 10+ residential. A damage cost calculation is, therefore, required to accompany the EMA.
- 3.25 If mitigation is not integrated into the plan at design stage, the local planning authority may require this through planning conditions or a Section 106 Agreement.

Damage Cost Calculation

- 3.26 The emissions calculation utilised the latest Defra EFT¹⁸ to determine the total transport related emissions (NO_x & PM_{2.5}) that would be generated by the Proposed Development.
- 3.27 Defra provides 'damage costs'¹⁹, 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.
- 3.28 Defra's Appraisal Toolkit²⁰, which incorporates the latest damage cost values, was used in the calculation. The principal of the calculation is summarised in the equation below::
- $$EFT \text{ output} \times \text{Damage costs} \times 5 \text{ years} = 5 \text{ year exposure cost value (in £)}$$
- 3.29 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.
- 3.30 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.

18 Defra (2019). Emissions Factor Toolkit (v9.0)

19 Defra Damage Cost (2020) <https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance>

20 Defra. Air quality damage cost appraisal toolkit:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/887827/air-quality-damage-cost-appraisal-toolkit.xlsx

Consultation

- 3.31 ADC's Environmental Health Officer was contacted on 5th December 2019, to discuss the scope of this AQA. All aspects of the proposed scope were agreed with, but it was emphasized that attention should be given to the nearby industrial estate, which has received complaints regarding particulates affecting the nearby marina.
- 3.32 The complaints record and environmental permits have been requested, to inform us of the nature of potential issues resulting from the estate.
- 3.33 The permit for Tarmac Trading Ltd was received and, using the available information, it is deemed unlikely that activities on the industrial estate will impact air quality at the Application Site, as discussed in Section 6 of this report.

4. Baseline

- 4.1 This chapter is intended to establish prevailing air quality conditions in the vicinity of the Application Site.

UK-AIR Background Pollution

- 4.2 The UK-AIR predicted background pollution concentrations for NO₂, PM₁₀ and PM_{2.5} for 2017 to 2022 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: 501500, 102500).

Table 4.1: 2017 to 2022 background concentrations of pollutants at the application site.

Pollutant	Predicted background concentration (µg.m ⁻³)						Averaging Period	Air quality standard concentration (µg.m ⁻³)
	2017	2018	2019	2020	2021	2022		
NO ₂	11.1	10.7	10.4	10.0	9.6	9.3	annual mean	40
PM ₁₀	14.5	14.4	14.3	14.1	14.0	13.8	annual mean	40
PM _{2.5}	9.5	9.4	9.3	9.1	9.0	8.9	annual mean	25

- 4.3 The data in Table 4.1 show that annual mean background concentrations of NO₂, PM₁₀ and PM_{2.5}, in the vicinity of the application site between 2017 and 2022, were predicted to be well below their respective AQs. The data show that in 2020, NO₂, PM₁₀ and PM_{2.5} concentrations were predicted to be below their AQs by 75%, 64.7% and 63.6%, respectively. Pollution concentrations are likely to be below the respective AQs at the Application Site.
- 4.4 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

- 4.5 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 ASR¹⁵ released by ADC included 2018 monitoring data.

Automatic Monitoring

- 4.6 ADC does not currently undertake automatic (continuous) monitoring in the district.

Non-Automatic Monitoring

- 4.7 ADC operates an extensive non-automatic, NO₂ diffusion tube monitoring network across the district. The most recent available monitoring data for diffusion tubes located within 4km of the application site are included in Table 4.2.

Table 4.2: Monitoring data from ADC NO₂ diffusion tubes

Monitor	Type	Distance from the application site (km)	NO ₂ annual mean concentration (µg.m ⁻³)		
			2016	2017	2018
Litt03	UB	1.0	12.9	-	-
Litt01	R	1.0	22.6	24.5	23.0
Litt04	R	1.7	22.9	27.1	25.0
Ford08	R	1.9	16.6	18.5	18.0
Litt02	R	1.9	24.4	25.3	23.0
Arun17	K	2.7	-	-	35.0
Arun06	R	3.7	27.6	28.6	26.0
Yap19	R	3.9	-	16.9	17.0

Note: "UB" = urban background; "R" = roadside; "K" = kerbside.

- 4.8 The data in Table 4.2 show that annual mean concentrations of NO₂ have not exceeded the annual mean AQS in the administrative boundary of ADC. The highest concentration was recorded at Arun17 in 2018, 12.5% below the AQS. This tube was located within 1m of the A284, and as such, it is not considered to be representative of background concentrations at the application site.

- 4.9 The most relevant diffusion tube locations in respect to likely conditions at the application sites are those in Littlehampton (Litt). Litt03, the nearest urban background site to the Proposed Development indicates that background concentrations there will likely be well below the $40\mu\text{g.m}^{-3}$ AQS, and likely similar to UK-AIR predictions.
- 4.10 Litt02 is located further east on the A259, and recorded a 2018 concentration 42.5% below the AQS. This strongly suggests that concentrations at the Proposed Development will also be below the AQS, and therefore suitable for the introduction of new residential receptors.

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 consultants, information provided by the clients and Google Earth imagery.

Dust Emission Magnitude

Demolition

- 5.3 Approximately 500m³ of building is expected to be demolished, all at heights of less than 10m above ground level. These factors fall into the IAQM's 'Small' dust emission category for demolition.
- 5.4 As such, the overall dust emission magnitude for the demolition phase is considered to be *Small* with reference to IAQM guidance⁹.

Earthworks

- 5.5 The area of the site has been approximated to be 27,000m². This is considered 'Large' with reference to IAQM guidance.
- 5.6 During the earthworks phase, it is unknown how many earth moving vehicles will be active at any one time, but they are anticipated to shift less than 20,000 tonnes of earth, which falls into the IAQM's 'Small' dust emission magnitude.
- 5.7 For conservative purposes, the overall dust emission magnitude for the earthworks phase is considered to be *Medium*, with reference to IAQM guidance.

Construction

- 5.8 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. Concrete piling is anticipated on-site.
- 5.9 The primary construction materials and methods to be used for the proposed dwellings will be concrete piling, steel sheet piles and concrete and conventional masonry. The total volume of the buildings to be constructed is anticipated to be between 25,000-100,000m³, which falls into the IAQM's 'Medium' dust emission category.

- 5.10 The overall dust emission magnitude for the construction phase is based on the materials to be used, the processes involved and development size. The IAQM suggest it may be appropriate to increase the overall dust emission magnitude category, if activities with a high potential for dust emissions, such as concrete piling, is to be carried out. As such, dust emissions from construction activities are considered to be *Large*, with reference to IAQM guidance.

Trackout

- 5.11 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.
- 5.12 For this development, any unpaved road surface materials are expected to have a low potential for dust release.
- 5.13 As well as the type of road surface, the number of daily outward movements of HDVs accessing the site is used to determine dust emission magnitude during construction: <10 Small; 10-50 Medium; and >50 Large. The number of daily HDVs departing the site is unknown at this stage.
- 5.14 For conservative purposes, the overall the dust emission magnitude for the trackout phase is considered to be *Medium* with reference to IAQM guidance.

Emission Magnitude Summary

- 5.15 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.

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

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

Sensitivity of the Area

- 5.16 Having established the emission magnitude for dust 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.
- 5.17 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.
- 5.18 Medium sensitivity receptors include areas where people wouldn't reasonably be expected to be present for extended periods of time (e.g. places of work or parks).
- 5.19 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.
- 5.20 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.
- 5.21 The approximate number of high and medium 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 Medium and High Sensitivity Human Receptors close to the site

Distance to site (m)	Approximate number of receptors	Receptor Details
High Sensitivity Receptors		
<20	0	-
<50	0	-
<100	0	-
<350	100	Residential Littlehampton Marina
Medium Sensitivity Receptors		
<20	0	-

<50	0	-
<100	10	Workplaces
<350	50	Workplaces

- 5.22 Figure 3, a Wind Rose from Shoreham Airport (2018), shows that the predominant wind directions at the application site are likely to be from the south west and the north. As shown in Figure 2, there are no highly sensitive receptors (residential) nearby or to the immediate north-east (downwind) of the site. As such, the sensitivity of the area to dust soiling impacts is defined as *Low*.
- 5.23 UK-AIR predicted annual mean concentrations of PM₁₀ are well below 24µg.m⁻³ at the site. This provides a good indication that PM₁₀ concentrations for both annual mean and daily mean concentrations are likely to be below the respective AQs at the site and adjacent uses. Therefore, the sensitivity of the area to human health impacts is defined as *Low*.
- 5.24 Review of the MAGIC website¹⁶, which incorporates Natural England's interactive maps, has identified no statutory ecological sensitive receptors within 50m of the site, or within 50m of roads expected to be used, up to 500m from the site. The nearest statutory ecological receptor is the Climping Beach SSSI over 1km away.

Risk of Impacts

- 5.25 Having established the likely 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
Demolition	Negligible	Negligible	Negligible
Earthworks	Low	Negligible	Low
Construction	Low	Negligible	Low
Trackout	Low	Negligible	Low

- 5.26 Overall, the Proposed Development is considered to present a *Low Risk* for nuisance dust soiling effects, *Low* for PM₁₀ health effects and *Negligible* for ecology, in the absence of mitigation.

Site Specific Mitigation

- 5.27 The GLA guidance 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.*

- 5.28 In addition, the IAQM lists recommended mitigation measures for low, medium and high Dust Impact Risks. The highly recommended mitigation measures for Low Risk sites are included in Appendix A of this report.
- 5.29 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

- 5.30 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. Impacts from the Industrial Estate

- *****
- 6.1 ADC's EHO has expressed concern over the potential for emissions from the Riverside Industrial Estate to impact on the Proposed Development. Riverside Industrial Estate contains two organisations of particular concern – *Tarmac Trading Ltd* roadstone coating plant, and *Littlehampton Welding*.
- 6.2 Complaints regarding the roadstone coating site (Tarmac Trading Ltd) relate to poor siting of a mobile crusher, which is used a few times a year. Three complaints were made from addresses on Gloucester Road, within 200m to the north-east (in the direction of the prevailing wind) of the mobile crusher. The Application Site would likely be greater than 200m from this crusher and in the opposite direction to the prevailing wind. As such, it is unlikely that a statutory nuisance will be caused at the Site by Tarmac Trading Ltd crushing activities.
- 6.3 Information regarding the complaints on Littlehampton Welding is limited, though investigations are likely to be carried out in future. A complaint, possibly relating to the welding site, came from the marina approximately 40m away. Given the Application Site is at least 100m away from Littlehampton Welding, using IAQM guidance⁹, a statutory nuisance is unlikely to occur at the Proposed Development. This has been agreed by ADC's EHO.
- 6.4 Defra's '*Environmental Permitting – General Guidance manual on Policy and Procedures for A2 and B Installations*²¹' is the key guidance document for small to medium scale industrial activities. Within this document, the following statements regarding the use of permits and statutory nuisances are provided:

"The LAPPC and LA-IPPC regimes are both concerned with including in permits all measures necessary to achieve a high level of protection of the environment. This is to be achieved by, among other things, taking all appropriate preventative measures against pollution, in particular through the application of best available techniques (see Articles 3 and 10 of the IPPC Directive as referred to in Annex VIII of the Manual)."

"Authorities are reminded that LAPPC was set up to go beyond the statutory nuisance regime in relation to prescribed processes. LAPPC should certainly address nuisance via BAT. But, beyond this, the regime is intended as a mechanism for minimising air emissions which may not cause a local nuisance and, indeed, may not have any potential impacts locally."

21 Defra (2012). *Environmental Permitting – General Guidance manual on Policy and Procedures for A2 and B Installations*.

6.5 *Tarmac Trading Ltd* has received an environmental permit (under the LAPPC regime), with several legal requirements imposed to prevent the emission of harmful pollutants. As states above, this permit must include all measures necessary to protect the environment and prevent statutory nuisances. Of most relevance, the permit requires the control of particulate matter and sulphur dioxide emissions at the roadstone coating plant.

6.6 The environmental permit also states that there must be:

❖ *No visible emissions to cross site boundary*

❖ *No abnormal emission*

❖ *No droplets, no persistent mist, no persistent fume, no visible smoke except during start-up of coating plant and then no darker than Ringelmann 1*

6.7 The '*Process Guidance Note 3/15(12): Statutory guidance for roadstone coating*²² includes the following statement, discussing an industry's obligation to ensure any stacks are of sufficient height to remove the likelihood that emitted particulates could be harmful:

"Pollutants that are emitted via a stack require sufficient dispersion and dilution in the atmosphere to ensure that they ground at concentrations that are deemed harmless. This is the basis upon which stack heights are calculated using HMIP Technical Guidance Note (Dispersion) D1. The stack height so obtained is adjusted to take into account local meteorological data, local topography, nearby emissions and the influence of plant structure."

6.8 Lastly, Paragraph 183 of the NPPF³ provides the following statement, stipulating that planning decisions should assume fully effective operation of nearby pollutant emitters:

"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

22 Defra (2012). *Process Guidance Note 3/15(12): Statutory guidance for roadstone coating*.

- 6.9 Given the above, the distance from the application site (>100m from the Welding site and >300m for the Tarmac site) and the prevailing wind direction, the industrial estate should not be posing air quality issues at the Proposed Development.
- 6.10 The EHO agrees that "given the distance and wind direction these sites shouldn't cause an air quality issue at the proposed development". They have, however, requested that further investigation be carried out if anything unexpected is identified, relating to emissions from the nearby industrial site.

7. Emissions Mitigation Assessment

- 7.1 To fulfil the requirements of ADC and the Sussex-Air guidance, an emissions mitigation assessment has been provided.

Emissions Cost Calculation

- 7.2 Following the July 2020 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. Defra's 2020 update of the calculation puts greater emphasis on PM_{2.5} emissions as it is deemed to have greater health implications. As such, the calculation has costed for the impacts of NO_x and PM_{2.5}.
- 7.3 To evaluate the scale of a Proposed Development's total emissions, Defra recommends an emissions cost calculation using the following formula:

$$\text{Road Transport Emission Increase (Cost, £)} =$$

$$\text{Estimated trip rate for 5 years} \times \text{Emission Rate/10km/vehicle type} \times \text{Damage Costs}$$

- 7.4 The latest Defra Emissions Factor Toolkit¹⁸ 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: Emission Factor Toolkit Inputs

Input	Value	Unit	Source/guidance
Trip Length	10	km	AQEMGFS
Traffic Flow	639	AADT	Odyssey
EFT Road Type	Urban (not London)	-	EFT
EFT Years	2023-2027	-	EFT
Average Speed	50	km.hr ⁻¹	AQEMGFS
Appraisal period	5	years	AQEMGFS

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

- 7.6 The calculation accounts for an 'uplift factor' of 2% cumulatively per annum and a 'discount rate', in line with the latest 2020 guidance. Central estimate damage costs for 'Road Transport Urban Medium' were based on Defra 2020 prices.

Table 7.2: Emission Cost Calculation for NO_x.

	2023	2024	2025	2026	2027
NO _x Increase (tonnes)	0.538	0.496	0.455	0.418	0.383
Central Damage cost (NO _x)	9075	9256	9441	9630	9823
Adjusted Damage cost (NO _x)	4885	4432	4010	3630	3278
Total	£20,235				

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

	2023	2024	2025	2026	2027
PM _{2.5} Increase (tonnes)	0.041	0.041	0.041	0.041	0.040
Central Damage cost (PM _{2.5})	79612	81204	82828	84485	86174
Adjusted Damage cost (PM _{2.5})	3291	3216	3149	3089	3034
Total	£15,778				

- 7.7 The total damage costs are summarised as follows:

NO_x emission 'damage' (cost, £) = £20,235

PM_{2.5} emission 'damage' (cost, £) = £15,778

TOTAL (cost, £) = £36,013

Mitigation

- 7.8 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'.
- 7.9 The AQEMGFS states that the mitigation options selected should be relevant and appropriate to:

☛ "Local policies:

❖ *The local authority's Air Quality Action Plan; and*

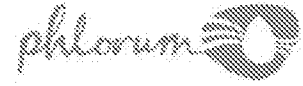
❖ *The type, size and location of the development."*

- 7.10 This damage cost calculation gives a benchmark against which the Proposed Development can compare whether the level of mitigation is appropriate, irrelevant of whether the development would have a significant impact on local air quality.
- 7.11 For all residential developments considered as 'Major' under AQEMGFS, the following mitigation measures are required:
- ❖ 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 local guidance documentation.
- 7.12 The proposed energy strategy is based on an efficient and renewable electrical Air Source Heat Pump system. As such, it is not anticipated that any gas-fired boilers will be required.
- 7.13 The client has agreed to the requirements of WSCC's Parking Guidance¹³. Construction activities are currently anticipated to begin in 2021 – as such, the client intends to implement 33% of parking spaces with EV charging points. With 202 parking spaces proposed, this will equate to approximately 67 EV charging points.
- 7.14 Though the Proposed Development is at Outline planning stage, the client is intending to implement further measures within the scheme, supporting Policies QE DM3 and T SP1 of the Local Plan:
- ❖ A Residential Travel Plan is being developed, with several proposed measures to encourage active and sustainable travel, whilst discouraging private petrol and diesel vehicle use across a 5 year period;
 - ❖ Supporting local walking and cycling initiatives, including improvements to cycle paths to link with the local cycle network, on top of a series of structural improvements to the adjacent Bridge Road roundabout to improve pedestrian and cyclist access, equating to costs well in exceedance of the calculated 'emissions cost';
 - ❖ Adequate provision of secure cycle storage (205 cycle parking spaces); and
 - ❖ The use of green infrastructure along the perimeter of the Site facing the main road, acting as a barrier against traffic-generated pollutants.

- 7.15 With plans still developing, the exact details of the mitigation package cannot yet be finalised. However, it is anticipated that the above mitigation measures, and implementation of certain measures included within the Residential Travel Plan, will suffice in fully offsetting the above calculated 'emissions cost' of £36,013.

8. Discussion

- *****
- 8.1 ADC has declared no AQMAs across Arun, due to there being no exceedances of the relevant AQs for monitored pollutants. Pollution concentrations are therefore generally good, with local monitoring data and data from the UK-AIR suggesting background concentrations in the vicinity of the site are well below the key AQs for NO₂, PM₁₀ and PM_{2.5}.
- 8.2 An air quality assessment was principally required to assess the following:
- ✦ Potential impacts of the construction phase of the development;
 - ✦ Potential exposure of new receptors to an area of existing poor air quality; and
 - ✦ Potential operational impacts of generated traffic on nearby sensitive receptors
- 8.3 The construction phase of the development could give rise to emissions which could cause dust soiling effects on adjacent uses. However, by adopting appropriate mitigation measures to reduce emissions and their potential impact, there should be no significant residual effects, thus complying with the requirements of the NPPF and PPG.
- 8.4 Concerns were raised by the EHO regarding pollutants emitted by nearby industrial site. QE SP1 of the Local Plan states that such matters must be taken into consideration when determining the suitability of a site. As discussed within Section 6, the potential influence of the industrial site on the Proposed Development has been qualitatively assessed to be insignificant. This was based on its distance from the site, prevailing wind direction, *Tarmac Trading Ltd's* environmental permit and the legal requirements for the associated industrial activities, regarding the emission of harmful pollutants.
- 8.5 Assessing the exposure of new receptors to an area of existing poor air quality has been screening out due to the following:
- ✦ Air pollution is considered to be good throughout the district;
 - ✦ The nearest residential dwelling is anticipated to be over 20m from the roadside, where pollutant concentrations should be approaching background levels; and
 - ✦ An expansive treeline separates the main road from proposed dwellings, acting as a barrier from transport-related emissions
- 8.6 Furthermore, assessing the impacts of generated traffic on nearby receptors has also been screened out, using EPUK/IAQM guidance.



- 8.7 As the Proposed Development is not set to introduce receptors to an area of poor air quality, nor should it have a significant impact on local air quality, there is no requirement for site specific air quality mitigation to make the scheme acceptable, in air quality terms.
- 8.8 Nonetheless, to reduce the impact of incremental increases in air pollutant concentrations as a result of the scheme, ADC require new developments to comply with the AQEMGFS and WSCC guidance.
- 8.9 As such, an Emissions Mitigations Assessment has been provided, suggesting the scheme should aim to incorporate mitigation measures approximating to a value of £36,016. Mitigation measures proposed by the client are included in Section 7, which are anticipated to fully offset the calculated emissions cost.

9. Conclusions

- *****
- 9.1 Stolon Studio Ltd commissioned Phlorum to undertake an Air Quality Assessment for the Proposed Development at Hampton Quay, Littlehampton. The proposal was to construct up to 105 new residential dwellings, 20 moorings and 330m² of commercial space.
 - 9.2 UK-AIR background concentrations and local air quality monitoring results from the wider area suggest that air quality within the district are generally good, and background pollution concentrations across the site are likely to be well below the relevant UK Air Quality Strategy Standard concentrations.
 - 9.3 During construction, adopting appropriate mitigation measures should prevent any significant air quality effects on the surrounding area.
 - 9.4 Pollution concentrations across the site are predicted to be well below the relevant Air Quality Standards. As such, the site is considered acceptable for the proposed introduction of new receptors.
 - 9.5 Increases in pollution concentrations as a result of development-generated traffic are not expected to have a significant impact on local air quality, as the vehicle trip generation is below the threshold of 500 daily trips on any road link.
 - 9.6 To mitigate for future emissions and offset potential 'emissions costs', the development will include several mitigation measures, as listed in Section 7 of this report. It is anticipated that the proposed mitigation package will completely offset the 'emission costs'.
 - 9.7 Following the finalisation and implementation of a suitable air quality mitigation package, the Proposed Development will align with all relevant air quality policy and Sussex-Air's Air Quality and Emissions Mitigation Guidance. As such, air quality should not to pose any significant obstacles to the planning process.

Figures and Appendices

Figure 1: Site Location Plan

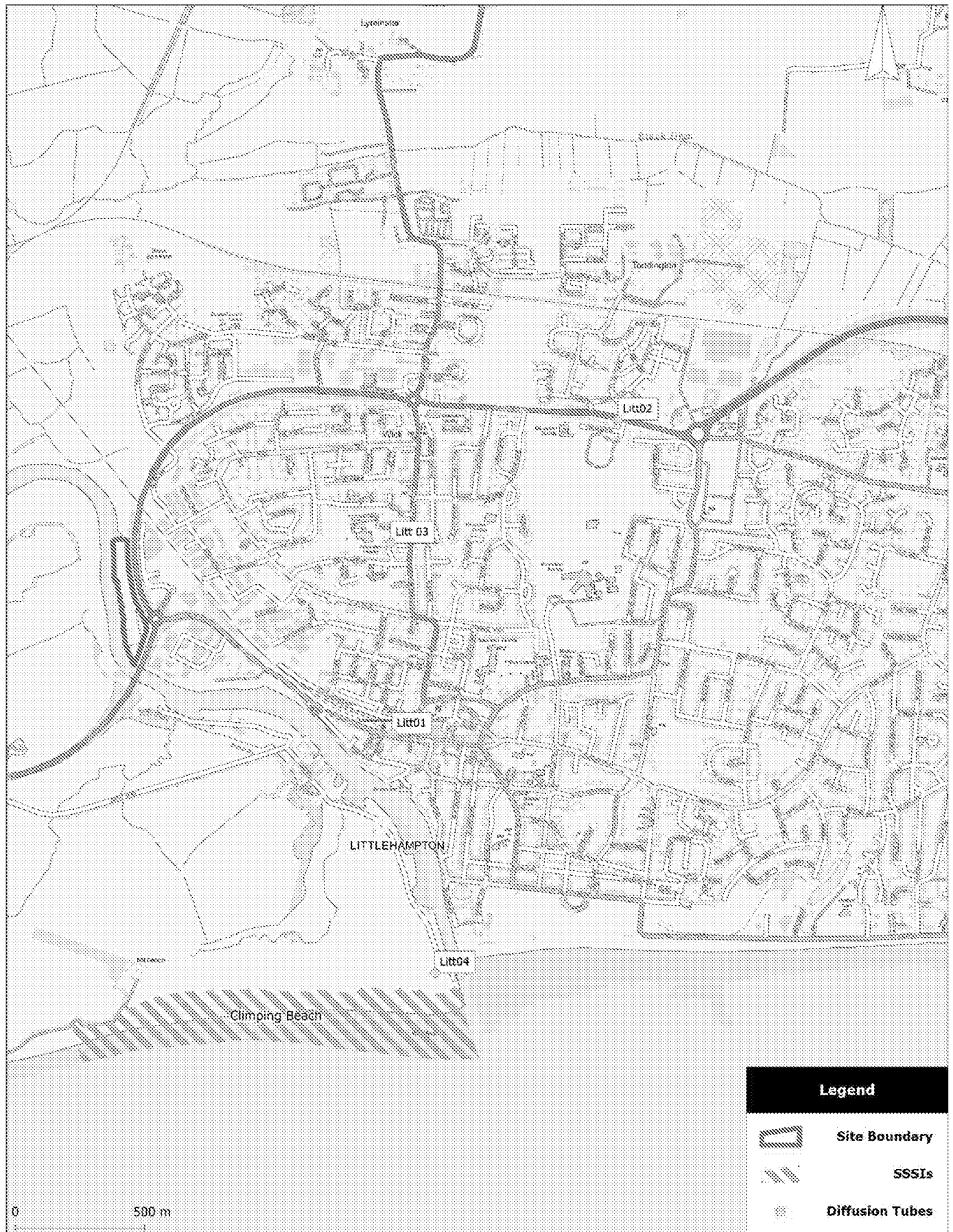
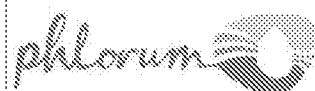


Figure 1: Site Location Plan

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Figure 2: Construction Phase Receptors

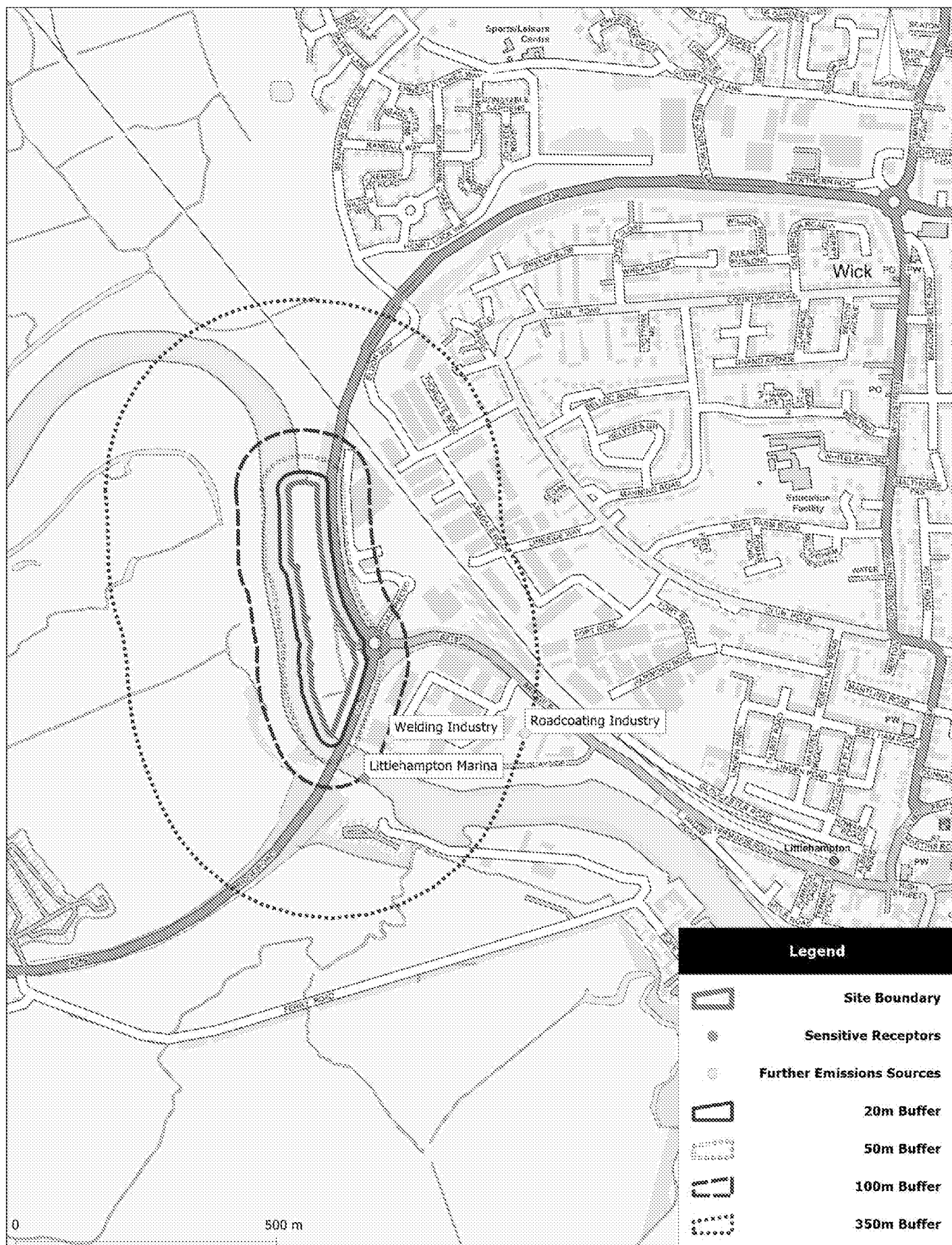
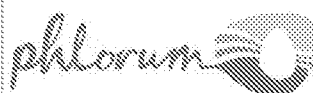


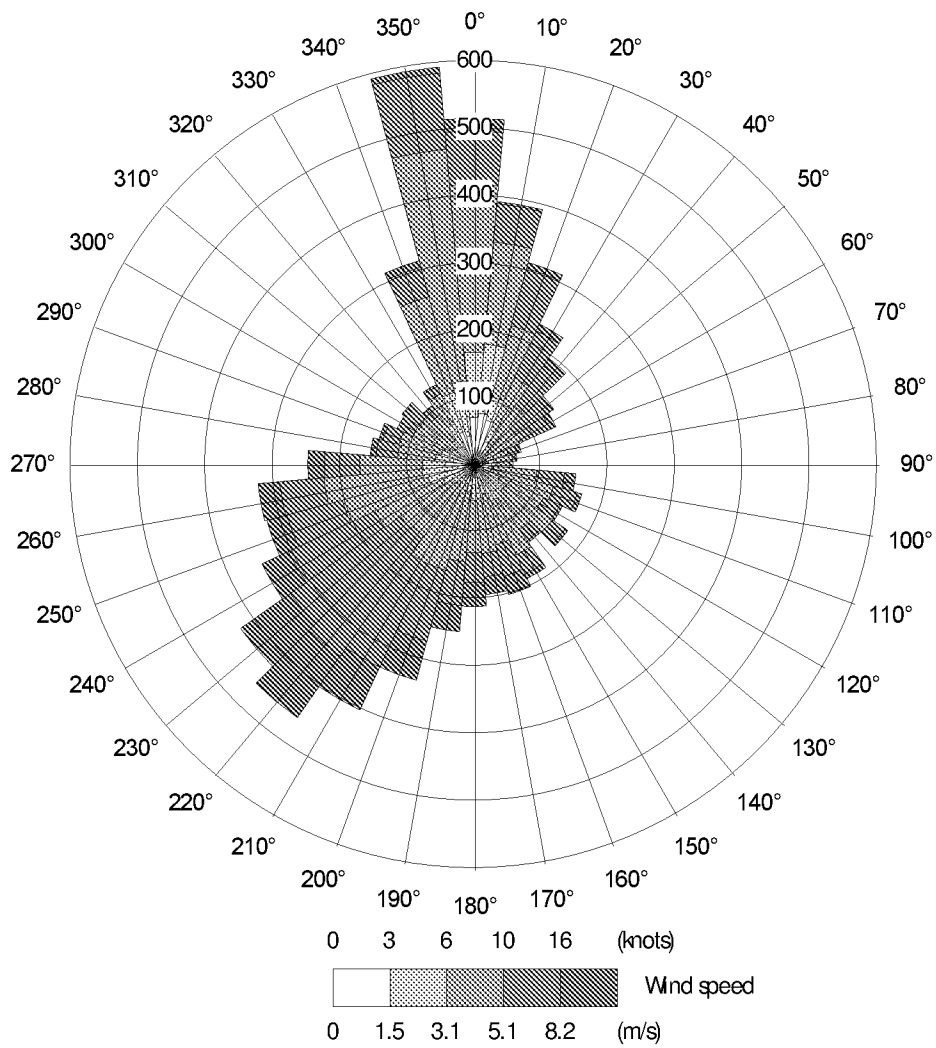
Figure 2: Construction Phase Receptors

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Figure 3: Wind Rose for Shoreham Airport, 2018



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

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

Please refer to the IAQM's Construction Dust Guidance (*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)*²³ for further, "desirable", mitigation measures.

Communications

- ❖ Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- ❖ Display the head or regional office contact information.

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 log book.

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.

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.
- ❖ Avoid site runoff of water or mud.

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.

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

23 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

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.

Waste Management

- ❖ Avoid bonfires and burning of waste materials.

Demolition

- ❖ Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- ❖ Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- ❖ Bag and remove any biological debris or damp down such material before demolition.

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