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HAINE ROAD, RAMSGATE

AIR QUALITY MITIGATION STATEMENT

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1.0 INTRODUCTION

Active Land & Build Ltd has appointed Lustre Consulting Limited to prepare an Air Quality Mitigation Statement for the proposed residential development situated along Haine Road in Ramsgate, Kent. The mitigation statement relates to the construction and operational phase of the proposed development and has been produced in accordance with comments made by the Environmental Health Officer (EHO) on 31/10/2017 and the Thanet Air Quality Technical Planning Guidance.

2.0 PLANNING POLICY & GUIDANCE

2.1 Construction Phase

The Institute of Air Quality Management (IAQM) has published guidance on the assessment of dust from construction and demolition[1]. Based on this guidance, the main air quality impacts that may arise during construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM_{10} concentrations, as a result of dust generating activities on site; and
- An increase in concentrations or airborne particles and nitrogen dioxide due to exhaust emissions from diesel powered vehicles and equipment on site.

In relation to the most likely impacts, the guidance states the following:

"*The most common impacts are dust soiling and increased ambient PM_{10} concentrations due to dust arising from activities on the site. Dust soiling will arise from the deposition of particulate matter in all size fractions.*

Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed".

The guidance continues by providing an assessment procedure. This includes sub-dividing construction activities into four types (demolition, earthworks, construction and track out) to reflect their different potential impacts.

[1] Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf

2.2 Operational Phase

The mitigation statement has been undertaken in accordance with the methodology outlined within the Thanet Air Quality Technical Planning Guidance. It states that the mitigation statement must include the following:

- Development traffic input data for emissions mitigation calculation
- Emissions calculation and totals
- Mitigation proposed to be equivalent to the value of emissions calculation (appropriate to the type and size of development and local policy requirements)
- Statement of provision required to minimise dust emissions in accordance with the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

3.0 BACKGROUND DATA

Background NOx, NO_2 and PM_{10} concentrations have been obtained from Defra[2]. These 1 km x 1 km grid resolution maps are derived from a base year of 2015 (for NOx, NO_2, PM_{10} and $PM_{2.5}$ only), which are then projected to a baseline year (2016), which corresponds with the latest monitoring data available from the Council. Background concentrations of NOx, NO_2, PM_{10} and $PM_{2.5}$ derived from Defra are provided in Table 1.

Table 1 - Background NOx, NO_2, PM_{10} and $PM_{2.5}$ Concentrations (µg/m^3)

Pollutant	Defra Mapped Location		2016
	X	Y	
NO_2	635500	166500	11.1
NOx			15.0
PM_{10}			15.1
$PM_{2.5}$			10.1

Based on the data provided in Table 1, background concentrations in the vicinity of the proposed development are well below the relevant air quality objectives.

There is no monitoring data in the vicinity of the proposed development.

[2] http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2015

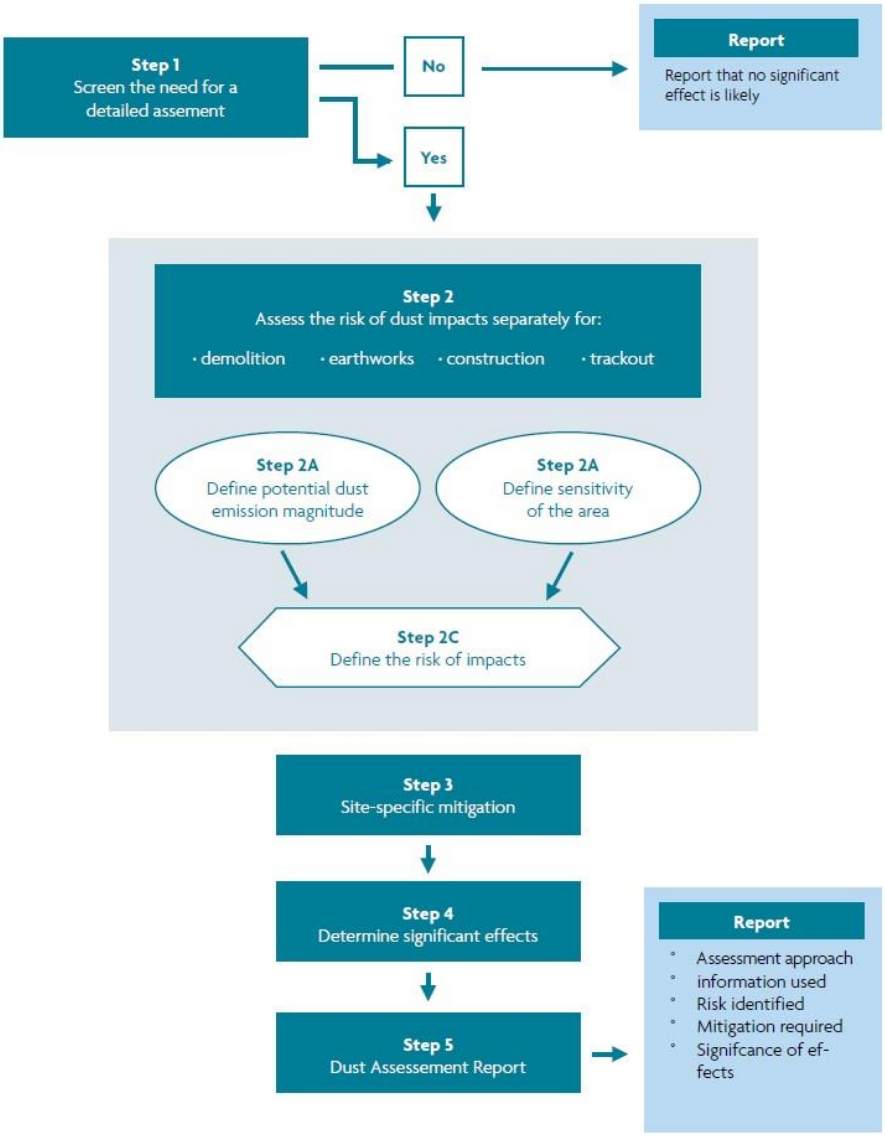
4.0 CONSTRUCTION PHASE

4.1 Methodology

Using the guidance published by the Institute of Air Quality Management (IAQM) the potential for dust emissions to be generated during the construction phase has been assessed for each activity that is likely to take place.

The conditions with no mitigation thus form the baseline or “do-nothing” situation for a construction site. The assessment procedure uses the steps provided in the guidance and summarised in Figure 1.

Figure 1 – Dust Assessment Procedure



The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high risk. A development is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large (see Table 2); and
- the sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity.

These two factors are combined to determine the risk of dust impacts with no mitigation applied (see Table 3). The risk category assigned to the development can be different for each of the four potential activities (demolition, earthworks, construction and trackout).

Table 2 – Dust Emission Magnitude

Activity	Dust Emission Class		
	Large	**Medium**	**Small**
Demolition	Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level	Total building volume 20,000 – 50 000m^3, potentially dusty construction material, demolition activities 10-20 m above ground level	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months
Earthworks	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes	Total site area 2,500 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes	Total site area <2,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10,000 tonnes, earthworks during wetter months
Construction	Total building volume >100,000 m^3, piling, on site concrete batching; sandblasting	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), piling, on site concrete batching	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)
Track out	>50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m	10 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100 m;	<10 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50 m.

Table 3 – Risk of Dust Impacts

Construction Activity	Sensitivity of Area	Dust Emission Magnitude		
		Large	Medium	Small
Demolition	High	High Risk	Medium Risk	Medium Risk
	Medium	High Risk	Medium Risk	Low Risk
	Low	Medium Risk	Low Risk	Negligible
Earthworks	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Construction	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Track out	High	High Risk	Low Risk	Low Risk
	Medium	Medium Risk	Low Risk	Negligible
	Low	Low Risk	Low Risk	Negligible

4.2 Construction Impact Assessment

The assessment of construction activities has focused on demolition, earthworks, construction and track out activities at the site. Using the criteria provided in Table 8 the dust emission magnitude for each activity is as follows:

- Demolition = No Structures to Remove;
- Earthworks = Large;
- Construction = Medium; and
- Track out = Medium.

Based on the IAQM guidance the sensitivity of the surrounding area is summarised in Table 4.

Table 4 – Sensitivity of the Surrounding Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium	Medium	Medium
Human Health	N/A	Low	Low	Low
Ecological	N/A	N/A	N/A	N/A

The dust emission magnitudes and sensitivity of the surrounding area are combined to determine the risk of dust impacts with no mitigation applied. These are summarised in Table 5.

Table 5 – Summary of Dust Risk

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

It should also be noted that the likelihood of an adverse impact occurring is correlated to wind speed and wind direction. As such, unfavourable wind speeds and wind directions must occur at the same time as a dust generating activity in order to generate an adverse impact. The overall impacts also assume that the dust generating activities are occurring over the entirety of the site meaning that as an activity moves further away from a potential receptor the magnitude and significance of the impact will be further reduced.

5.0 OPERATIONAL PHASE

5.1 Damage Cost Calculation

A damage cost calculation was undertaken for NOx, PM_{10} and $PM_{2.5}$ to determine the level of mitigation to be implemented as part of the scheme. Using the methodology supplied within the Thanet Air Quality Technical Planning Guidance the damage cost (without mitigation) was calculated using the following procedure:

1. Identifying the additional trip rates generated by the proposed development;
2. The emissions calculated for the pollutants of concern (NOx, PM_{10} and $PM_{2.5}$) using the latest Emissions Factor Toolkit (EFT)[3];
3. The air quality damage costs calculation for the specific pollutant emissions.

The damage cost (without mitigation) has been calculated over five years from 2017. This is an estimate of the costs to society due to impact of increases in emissions associated with the proposed development. It should be noted that this calculation assumes no improvement in vehicle emissions (as contained in the EFT) following completion of the proposed development and is therefore worst case.

[3] https://laqm.defra.gov.uk/documents/EFT2017_v8.0.zip

RMB Consultants (Civil Engineering) Ltd have advised that the proposed development would generate 470 daily vehicle movements (0.1% HDVs). This input is summarised in Table 6 along with the subsequent calculations.

Table 6 – Input Data and Calculations for Damage Costs

EFT Input Parameter	EFT Input
Road Type	Urban (not London)
Traffic flow	470
%HDV	0.1%
Speed (kph)	48
No of Hours	24
Link Length (km)	10
EFT Output (NOx)	
Annual Emissions	605 kg/annum
IGCB Damage Costs (Central Estimate)	£25,252/tonne (or £21,044 if PM is also valued)
1-year Damage Cost	£12,732
5-year Damage Cost	£63,660
EFT Output (PM_{10})	
Annual Emissions	57 kg/annum
IGCB Damage Costs (Central Estimate)	£58,125
1-year Damage Cost	£3,313
5-year Damage Cost	£16,565
EFT Output ($PM_{2.5}$)	
Annual Emissions	33 kg/annum
IGCB Damage Costs (Central Estimate)	£58,125
1-year Damage Cost	£1,918
5-year Damage Cost	£9,590

The total damage cost is £89,815 over five years from 2017. This is an estimate of the costs to society due to the impact of increases in emissions associated with the proposed development. As defined by the IAQM/EPUK guidance[4] the damage cost relates to the value of mitigation that should be applied, preferably on-site.

[4] Land-Use Planning & Development Control: Planning for Air Quality. Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes. EPUK & IAQM. January 2017

6.0 MITIGATION MEASURES

6.1 Construction Phase

A qualitative assessment of dust levels associated with the proposed development has been carried out. Overall, the proposed development is considered to be a low to medium risk to local receptors. The impact of dust soiling and PM_{10} can be reduced to negligible through appropriate mitigation measures, which are listed in Table 7 and are applicable to a low to medium risk site. Implementation of these Best Practice Measures will help reduce the impact of the construction activities to an acceptable level.

With these mitigation measures enforced, the likelihood of nuisance dust episodes occurring at those receptors adjacent to the development are considered low. Notwithstanding this, the developer should take into account the potential impact of air quality and dust on occupational exposure standards (in order to minimise worker exposure) and breaches of air quality objectives that may occur outside the site boundary. Continuous visual assessment of the site should be undertaken, and a complaints log maintained in order determine the origin of a particular dust nuisance. Keeping an accurate and up to date complaints log will isolate particular site activities to a nuisance dust episode and help prevent it from reoccurring in the future.

Table 7 – Mitigation of Construction Activities

Construction Activity	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 document. The desirable measures should be included as appropriate for the site.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make a complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book.
Monitoring	Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions.
Preparing and maintaining the site	Plan site layout: machinery and dust causing activities should be located away from receptors.
	Erect solid screens or barriers around dust 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 actives for an extensive period
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery	Ensure all non-road mobile machinery (NRMM) comply with standards.
	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 possible.
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible).
	Use enclosed chutes, conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods
Waste Management	Reuse and recycle waste to reduce dust from waste materials
	Avoid bonfires and burning of waste materials.

6.2 Operational Phase

Although a Travel Plan has not been produced, the Transport Statement the following initiatives have been recommended within the Transport Statement to limit the use of cars and promote more sustainable travel options:

- secure cycle storage can be provided for all dwellings;
- information on cycle routes, public footpaths, and local bus and rail services can form part of any home buyer's welcome pack;
- broadband internet connections can facilitate home working;
- pedestrian links can be provided within the development and to existing footways and footpaths, in particular the existing footways that run north from the site to Newington;
- cycle links can be provided to existing traffic free cycle routes that link from the junction of Haine Road with Spratling Lane to Westwood and Broadstairs; and
- the new roundabout will provide enhanced pedestrian and cycle crossing facilities at Haine Road, encouraging more sustainable transport options.

In addition to these measures the Thanet Air Quality Technical Planning Guidance makes the following recommendations for residential developments:

- Travel plan (where required) including mechanisms for discouraging high emission vehicle use and encouraging the uptake of low emission fuels and technologies;
- A Welcome Pack available to all new residents online and as a booklet, containing information and incentives to encourage the use of sustainable transport modes from new occupiers;
- Eco-driver training and provision of eco-driver aid to all residents;
- EV recharging infrastructure within the development (wall mounted or free standing in-garage or off-street points);
- Car club provision within development or support given to local car club/eV car clubs;
- Designation of parking spaces for low emission vehicles;
- Improved cycle paths to link cycle network;
- Adequate provision of secure cycle storage;
- Using green infrastructure, in particular trees* to absorb dust and other pollutants.

In relation to EV charging, the Thanet guidance recommends 1 EV "rapid charge" point per dwelling with dedicated parking or 1 charging point per 10 spaces (unallocated parking). It also states that all gas-fired boilers to meet a minimum standard of <40mgNOx/kWh. Both these measures are in accordance with national air quality planning guidance.

The calculated damage cost in section 5.1 could 'offset' against the cost to implement the above travel options and selected recommendations within the Thanet planning guidance.

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