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146 – 150 ROYAL COLLEGE STREET, LONDON

AIR QUALITY
CONSTRUCTION IMPACT ASSESSMENT

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AIR QUALITY CONSTRUCTION IMPACT ASSESSMENT

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1.0 INTRODUCTION

1.1 RF Environmental Limited has been commissioned to undertake an air quality assessment based on the potential impacts from a proposed commercial development located at 146-150 Royal College Street in Camden, London.

1.2 Planning permission is to be sought for a new build office development at the site. Consideration of the air quality impacts has been requested.

1.3 According to information presented on the Camden Council website, a detailed air quality assessment is only required when a commercial development has a floor space of more than 1000m^2. The proposed development is expected to have a floor space of less than 1000m^2. In addition, no residential dwellings are to be introduced as part of this development and the exposure to poor air quality from existing road sources is not considered to be necessary.

1.4 Therefore, the aim of this assessment is to focus on the short-term impacts from the construction phase of the development.

2.0 PLANNING POLICY AND GUIDANCE

Supplementary Planning Guidance (SPG)

Control of Dust and Emissions during Construction and Demolition

2.1 The Greater London Authority (GLA) released the "Control of Dust and Emissions during Construction and Demolition" SPG in July 2014[1]. The guidance seeks to reduce emissions of dust and PM10 from construction and demolition activities in London. It also aims to manage emissions of nitrogen oxides (NOx) from construction and demolition machinery. The SPG:

- Provides more detailed guidance on the implementation of all relevant policies in the London Plan and the Mayor's Air Quality Strategy to neighbourhoods, boroughs, developers, architects, consultants and any other parties involved in any aspect of the demolition and construction process;
- Sets out the methodology for assessing the air quality impacts of construction and demolition in London; and
- Identifies good practice for mitigating and managing air quality impacts that is relevant and achievable, with the overarching aim of protecting public health and the environment.

2.2 The principles of the SPG apply to all developments in London as their associated construction and demolition activity may all contribute to poor air quality unless properly managed and mitigated.

[1] The Control of Dust and Emissions during Construction and Demolition SPG. Greater London Authority, July 2014

3.0 CONSTRUCTION PHASE

Methodology

3.1 Based on the "Control of Dust and Emissions during Construction and Demolition" SPG discussed in the previous section, 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.

3.2 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".

3.3 The guidance continues by providing an assessment procedure. This includes sub-dividing construction activities into four types to reflect their different potential impacts. These are as follows:

- Demolition;
- Earthworks;
- Construction; and
- Track out.

3.4 With regards to the proposed development the potential for dust emissions is assessed for each activity that is likely to take place. The assessment procedure assumes no mitigation measures are applied. 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 3.1.

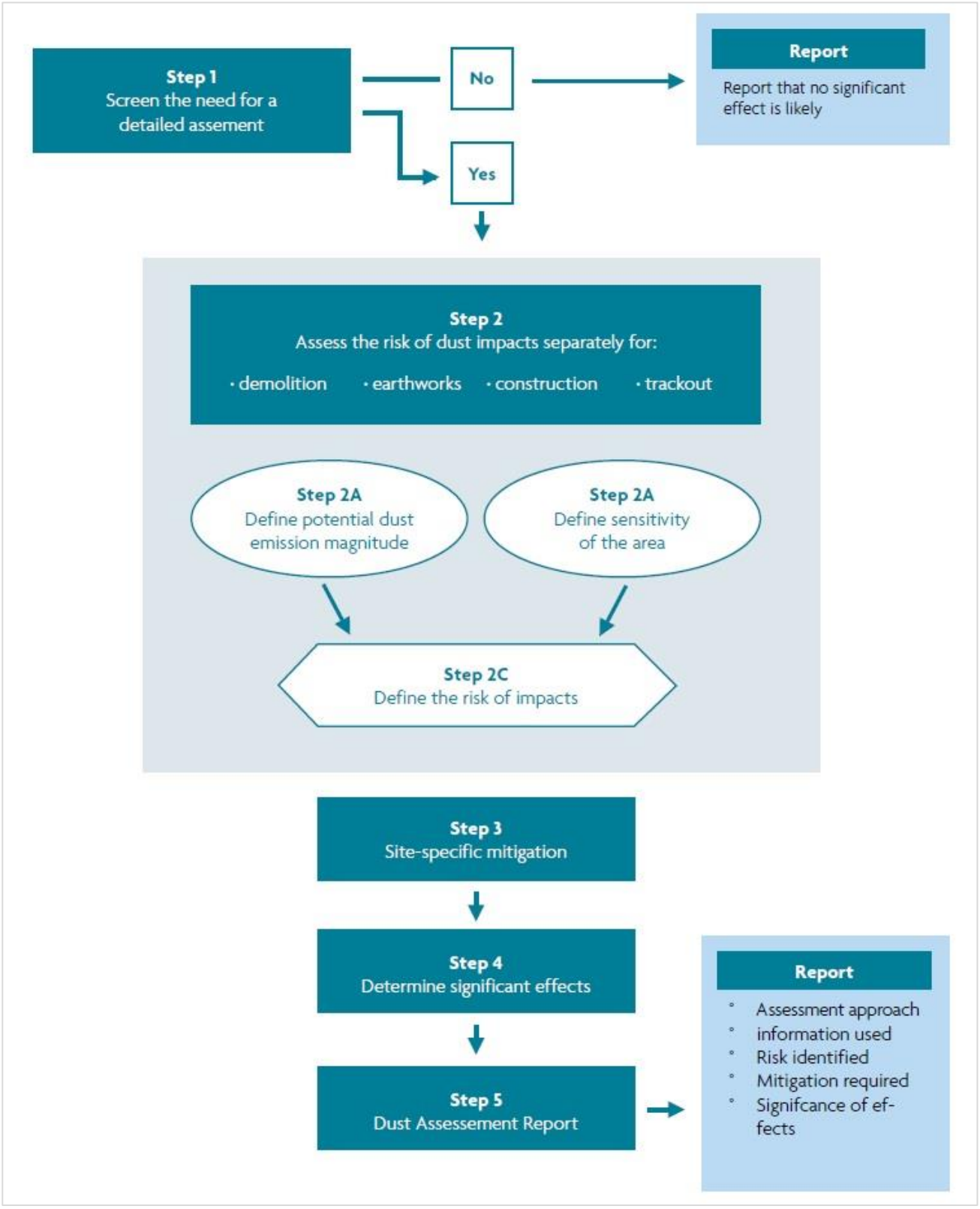

FIGURE 3.1: DUST ASSESSMENT PROCEDURE

Significance Criteria

3.5 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 3.1); and
- the sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity (Tables 3.2 and 3.3).

3.6 These two factors are combined to determine the risk of dust impacts with no mitigation applied (see Table 3.4). The risk category assigned to the development can be different for each of the four potential activities (demolition, earthworks, construction and trackout).

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 m3 – 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 3.1: DUST EMISSION MAGNITUDE

Sensitivity of the Area to Dust Soiling Effects					
Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

TABLE 3.2: SENSITIVITY OF THE AREA TO DUST SOILING EFFECTS ON PEOPLE AND PROPERTY

Sensitivity of the Area to Human Health Effects							
Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

TABLE: 3.3 SENSITIVITY OF THE AREA TO HUMAN HEALTH 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

TABLE 3.4: RISK OF DUST IMPACTS

4.0 CONSTRUCTION IMPACT ASSESSMENT

4.1 The assessment of construction activities has focused on earthworks, construction and track out activities at the site. No demolition is expected as part of the development. Using the criteria provided in Table 3.1, the dust emission magnitude for each activity is as follows:

- Demolition = N/A;
- Earthworks = Small;
- Construction = Small; and
- Track out = Small.

4.2 The sensitivity of the surrounding area to dust soiling and human health (Table 4.1) is then defined based on the criteria in Table 3.4, which includes the number of highly sensitive receptors that fall within a certain distance of the proposed construction phase (see Figure 4.1). On the basis of there are fewer than 100 highly sensitive receptors within 50 metres of the development site the overall sensitivity of the surrounding area is considered medium for dust soiling and low for human health.

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

TABLE 4.1: SENSITIVITY OF THE SURROUNDING AREA

4.3 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 4.2.

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

TABLE 4.2: SUMMARY OF DUST RISK

4.4 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.

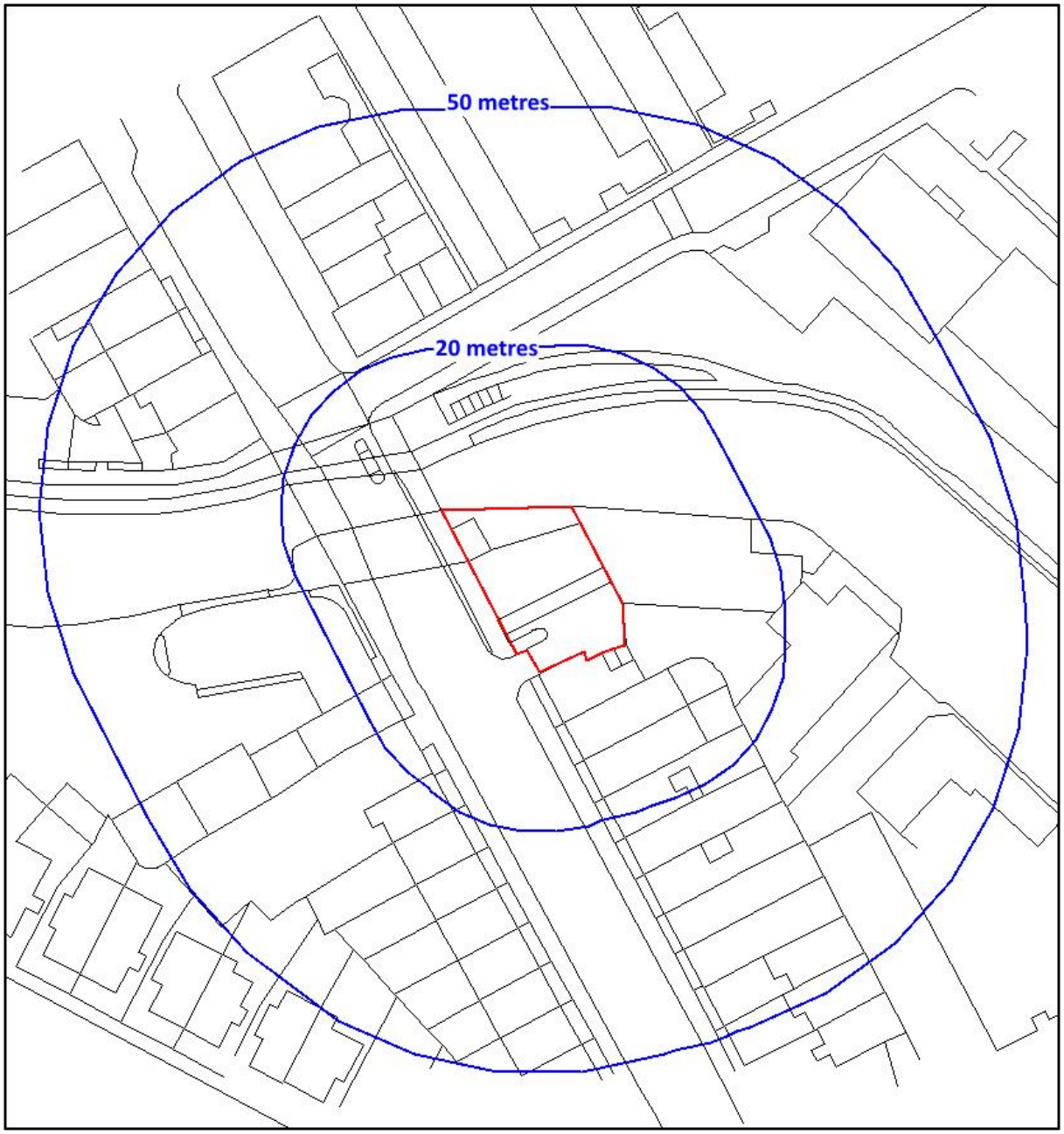

FIGURE 4.1: DISTANCE FROM THE PROPOSED DEVELOPMENT

5.0 MITIGATION MEASURES

5.1 A qualitative assessment of dust levels associated with the proposed development has been carried out. The impact of dust soiling and PM_{10} can be reduced to negligible through appropriate mitigation measures, which are listed in Table 5.1 and are applicable to a low risk site. Implementation of these Best Practice Measures will help reduce the impact of the construction activities.

5.2 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. Monitoring is not recommended at this stage, however, continuous visual assessment of the site should be undertaken and a complaints log maintained in order to 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.

Construction Activity	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 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.
	Avoid site runoff of water or mud.
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.
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.
Waste Management	Reuse and recycle waste to reduce dust from waste materials
	Avoid bonfires and burning of waste materials.

TABLE 5.1: MITIGATION OF CONSTRUCTION ACTIVITIES

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 RF Environmental Limited was commissioned to undertake an air quality assessment based on the potential impacts from a proposed commercial development located at 146-150 Royal College Street in Camden, London.

6.2 Owing to the size and nature of the development, consideration of the short-term impacts of the construction phase was required.

6.3 The Greater London Authority (GLA) *'Control of Dust and Emissions during the Construction and Demolition'* has been used to establish the level of risk of dust and PM_{10} from the construction phase of the development.

6.4 The results of the impact assessment have shown that the level of dust risk is low for dust soiling and negligible for human health and therefore no further action is required.

6.5 However, a number of mitigation options for the construction activities have been provided, to ensure Best Practice is applied at all times during the construction work