



# **APPENDIX ES9**

## **ES9.1 Air Quality Assessment Methodology**



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REPORT



## ES9.1 Air Quality Methodology

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### 1.0 AIR QUALITY IMPACT ASSESSMENT METHODOLOGY

In an EIA, it is necessary to establish a transparent methodology that sets out clearly the relevant criteria against which the potentially significant environmental effects of a development will be judged. The methods applied for this AQIA are detailed below.

#### 1.1 Assessment of Impact Magnitude and Significance

Assessment of the potential impact magnitude i.e. scale, arising from the release of airborne substances during the development, and the significance of residual effects on human health and the local environment (i.e. loss of amenity), has been undertaken in relation to both 'controlled' point source emissions and potential 'fugitive' releases during the following phases of site development:

- i) Site Construction i.e. during site preparation/construction works (dust and PM<sub>10</sub>), and
- ii) Site Operation i.e. road traffic emissions.

### 2.0 SITE CONSTRUCTION (DUST)

The assessment method is aligned with the Institute of Air Quality Management (IAQM) *Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance* (December 2011). In addition, best practice guidance presented in the Greater London Authority (GLA) Best Practice Guidance *Control of dust and emissions from construction and demolition sites* has been considered in the assessment.

The assessment of construction dust impact is based on the evaluation of probable risk for annoyance (i.e. loss of amenity) to occur due to soiling of surfaces by dust taking into account the site area, location (i.e. neighbouring receptors and their sensitivity), separation distances between potential dust sources and receptors and local meteorological conditions. Where assessed as having the potential for significant adverse effects, the necessary mitigation measures have been developed in order that residual impacts will be minimised.

The assessment steps are:

- Step 1 – Screening assessment to identify the requirement for a detailed assessment;
- Step 2 – Assess the risk of dust effects arising determined by evaluating the scale and nature of the works and proximity of sensitive receptors;
- Step 3 – Identify need for site-specific mitigation proposed construction activities, and
- Step 4 – Define effects and their significance after applying site-specific mitigation measures.

#### 2.1 Screening Criteria (IAQM)

Section ES12 details the location of sensitive receptors with respect to the Site boundary. Sensitive receptors are located within 500 m of the Site boundary (nearest existing dwelling c.30 m) and within 25 m of the route to be used by construction vehicles on the public highway.

Given the scale and extent of construction works and the proximity of sensitive receptors, it was deemed necessary to undertake a detailed assessment is deemed necessary for the development.



## 2.2 Determining Magnitude of Risk

Table App ES9.1: Sensitivity of Surrounding Area of the Site

Sensitivity	Human Receptors	Ecological Designations
Very High	<ul style="list-style-type: none"> <li>■ Very densely populated area.</li> <li>■ More than 100 dwellings within 20 m of site.</li> <li>■ Local PM<sub>10</sub> concentrations exceed the objective.</li> <li>■ Contaminated buildings present.</li> <li>■ Very sensitive receptors (e.g. oncology units).</li> <li>■ Works continue in one area of the site for more than one year.</li> </ul>	European designated site.
High	<ul style="list-style-type: none"> <li>■ Densely populated area.</li> <li>■ 10-100 dwellings within 20 m of site.</li> <li>■ Local PM<sub>10</sub> concentrations close to objective (e.g. annual mean 36-40 µg/m<sup>3</sup>).</li> <li>■ Commercially sensitive horticultural land within 20 m of site.</li> </ul>	Nationally Designated site.
Medium	<ul style="list-style-type: none"> <li>■ Suburban or edge of town area.</li> <li>■ Less than 10 dwellings within 20 m of site.</li> <li>■ Local PM<sub>10</sub> concentrations below the objective (e.g. annual mean 30-36 µg/m<sup>3</sup>).</li> </ul>	Locally designated site.
Low	<ul style="list-style-type: none"> <li>■ Rural area: industrial area.</li> <li>■ No dwellings within 20 m of site.</li> <li>■ Local PM<sub>10</sub> concentrations well below the objective (less than 75%).</li> </ul>	No designation

Table App ES9.2: Magnitude of Risk for Dust Soiling during Site Construction

Distance to Nearest Receptor (m) <sup>1</sup>		Dust Emission Class		
Dust Soiling and PM <sub>10</sub>	Ecological	Large	Medium	Small
<20	-	High Risk Site	High Risk Site	Medium Risk Site
20-100	<20	High Risk Site	Medium Risk Site	Low Risk Site
100-200	20-40	Medium Risk Site	Low Risk Site	Low Risk Site
200-350	40-100	Medium Risk Site	Low Risk Site	Negligible

<sup>1</sup>Distance from the dust emission source. Where this is not known then the distance should be from the site boundary (risk is based on the distance to the nearest receptors).

## 2.3 Significance Criteria

Table App ES9.3: Significance of Residual Effects (with mitigation)

Sensitivity of Surrounding Area	Risk of Site Giving Rise to Dust Effects		
	High	Medium	Low
Very High	Slight adverse	Slight adverse	Negligible
High	Slight adverse	Negligible	Negligible
Medium	Negligible	Negligible	Negligible
Low	Negligible	Negligible	Negligible



### 3.0 SITE OPERATION (ROAD TRAFFIC EMISSIONS)

#### 3.1 DMRB Screening

In terms of assessing the potential effects on local air quality of the changes in road traffic flow and composition brought about by the development, a screening assessment has been undertaken using the guidance given in the advice note HA 207/07 within Design Manual for Roads and Bridges.

Guidance in DMRB 11.3.1, 2007 is aimed at determining the level of assessment necessary to enable informed decision making for road schemes assessments. The guidance sets out the following criteria for identification of 'affected roads', (i.e. roads where traffic could have a significant impact on local air quality due to changes in traffic flows and composition):

- Road alignment will change by 5 m or more;
- AADT (Annual Average Daily Traffic) Flows will change by 1000 vehicles or more;
- HGV flows will change by 200 AADT or more;
- Daily average speed will change by 10 km/hr or more; or
- Peak hour speed will change by 20 km/hr or more.

#### 3.2 Determining the Magnitude of Risk

The Institute of Air Quality Management (IAQM, 2010) acknowledges that assessing the significance of impacts of a development on air quality cannot be reduced to strict, formulaic methodology and that judgement will always be required. In the absence of statutory guidance on significance criteria for air quality, the IAQM is currently working towards the development of a generic method for assessing the magnitude for changes in ambient pollutant concentrations against national air quality criteria set to protect human health and the environment (i.e. air quality objectives).

The IAQM significance approach has been modified accordingly to fit with the assessment of point source gaseous emissions (i.e. combustion, biogas) from the Facility, as presented below.



**Table App ES9.4: Definition of impact magnitude for changes in pollutant concentrations NO<sub>2</sub> and PM<sub>10</sub>**

Magnitude of Change	Description
Large	■ An increase/decrease of >4 µg/m <sup>3</sup> of the annual mean concentration.
Medium	■ An increase/decrease of 2-4 µg/m <sup>3</sup> of the annual mean concentration.
Small	■ An increase/decrease of 0.4-2 µg/m <sup>3</sup> of the annual mean concentration.
Imperceptible	■ An increase/decrease of <0.4 µg/m <sup>3</sup> of the annual mean concentration.

### 3.3 Significance Criteria

**Table App ES9.5: Air Quality Impacts Descriptors for Changes in Annual Mean NO<sub>2</sub> Concentrations**

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration**		
	Small	Medium	Large
<b>Increase with operation of Development</b>			
Above Objective/Limit Value WITH scheme (> 40 µg/m <sup>3</sup> )	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective Limit Value WITH scheme (36-40 µg/m <sup>3</sup> )	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective Limit Value WITH scheme (30-36 µg/m <sup>3</sup> )	Negligible	Slight Adverse	Slight Adverse
Well Below Objective Limit WITH scheme (< 30 µg/m <sup>3</sup> )	Negligible	Negligible	Slight Adverse
<b>Decrease with operation of Development</b>			
Above Objective/Limit Value WITHOUT scheme (> 40 µg/m <sup>3</sup> )	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective Limit Value WITHOUT scheme (36-40 µg/m <sup>3</sup> )	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective Limit Value WITHOUT scheme (30-36 µg/m <sup>3</sup> )	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective Limit WITHOUT scheme (< 30 µg/m <sup>3</sup> )	Negligible	Negligible	Slight Beneficial



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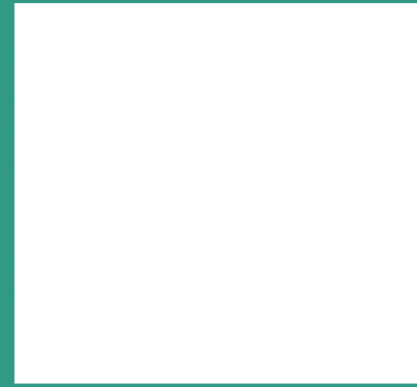
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