Teddington Direct River Abstraction

Preliminary Environmental Information Report

Appendix 13.1 – Construction Dust Assessment Methodology

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Appendix 13.1 – Construction Dust Assessment Methodology

A.1.1 The latest guidance from the Institute of Air Quality Management (IAQM) (IAQM, 2024) has been used to assess the potential impacts of the Teddington Direct River Abstraction (TDRA) Project (hereafter, 'the Project') in relation to fugitive dust emissions (including PM_{10} releases) during construction.

a. Demolition
b. Earthworks
c. Construction
d. Trackout – the transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network

Step 1: Screen the need for a detailed assessment

A.1.2 The risk of dust effects (low, medium or high) is determined by the scale and nature of the works and the proximity of sensitive human and ecological receptors.

A.1.3 The IAQM guidance recommends that an assessment be undertaken where there are sensitive human receptors:

a. Within 250m of the site boundary, or
b. Within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s)

A.1.4 An assessment should also be carried out where there are dust-sensitive ecological receptors:

a. Within 50m of the site boundary, or
b. Within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s)

Step 2a: Assess the risk of dust impacts – dust emission magnitude

A.1.5 The magnitude of the dust emission for each source is classified as small, medium or large depending on the scale of the proposed work. Table A.1 summarises the IAQM criteria that may be used to determine the magnitude of the effect associated with fugitive dust emissions. These criteria are used in combination with site-specific information and professional judgement.

Table A.1 Dust emission magnitude criteria

Source	Large	Medium	Small
Demolition	• Total building volume greater than (>)75,000m^3 • Potentially dusty material (e.g. concrete) • On-site crushing and screening • Demolition activities >12m above ground level	• Total building volume 12,000–75,000m^3 • Potentially dusty material • Demolition activities 6–12m above ground level	• Total building volume less than (<)12,000m^3 • Construction material with low potential for dust release • Demolition activities <6m above ground level • Demolition during wetter months
Earthworks	• Total site area >110,000m^2 • Potentially dusty soil type (e.g. clay) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >6m in height	• Total site area 18,000–110,000m^2 • Moderately dusty soil type (e.g. silt) • 5–10 heavy earth moving vehicles active at any one time • Formation of bunds 3–6m in height	• Total site area <18,000m^2 • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <4m in height
Construction	• Total building volume >75,000m^3 • On-site concrete batching • Sandblasting	• Total building volume 12,000–75,000m^3 • Potentially dusty construction material (e.g. concrete) • On-site concrete batching	• Total building volume <12,000m^3 • Material with low potential for dust release (e.g. metal cladding or timber)
Trackout	• >50 HDV movements in any one day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100m	• 20–50 HDV movements in any one day • Moderately dusty surface material (e.g. silt) • Unpaved road length 50–100m	• <20 HDV movements in any one day • Surface material with low potential for dust release • Unpaved road length <50m

Step 2b: Assess the risk of dust impacts – define the sensitivity of the area

A.1.6 Factors defining the sensitivity of a receptor are presented in Table A.2. The sensitivity of a receptor will also depend on a number of additional factors including any history of dust generating activities in the area, likely cumulative dust effects from nearby construction sites, any pre-existing physical screening such as trees or buildings and the likely duration of the effects. In addition, the influence of the prevailing wind direction and local topography may be of relevance when determining the sensitivity of a receptor.

A.1.7 The sensitivity of the area as a whole to dust soiling and health effects is dependent on the number of receptors within each sensitivity class and their distance from the source. In addition, human health effects are dependent on the existing PM_{10} concentrations in the area. Table A.3 and Table A.4 summarise the criteria for determining the overall sensitivity of an area to dust soiling and human health effects respectively. The sensitivity of the area to ecological effects is presented in Table A.5.

A.1.8 For each dust emission source (demolition, construction, earthworks and trackout), the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust effects.

Table A.2 Factors defining the dust sensitivity of a receptor

Sensitivity	Human health	Dust soiling	Ecological
High	• Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM_{10} (a) • Examples include residential dwellings, hospitals, schools and residential care homes	• Regular exposure • High level of amenity expected • Appearance, aesthetics or value of the property would be affected by dust soiling • Examples include residential dwellings, museums, medium- and long-term car parks and car showrooms	• Nationally or Internationally designated site with dust sensitive features (b) • Locations with vascular species (c)
Medium	• Locations where workers are exposed over a time period relevant to the air quality objectives for PM_{10} (a)	• Short-term exposure • Moderate level of amenity expected • Possible diminished appearance or aesthetics of	• Nationally designated site with dust sensitive features (b) • Nationally designated site with a particularly important plant

Sensitivity	Human health	Dust soiling	Ecological
	• Examples include office and shop workers (d)	property due to dust soiling • Examples include parks and places of work	species where dust sensitivity is unknown
Low	• Transient human exposure • Examples include public footpaths, playing fields, parks and shopping streets	• Transient exposure • Enjoyment of amenity not expected • Appearance and aesthetics of property unaffected • Examples include playing fields, farmland (e), footpaths, short-term car parks and roads	• Locally designated site with dust sensitive features (b)

(a) In the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more in a day.

(b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete).

(c) Cheffings C. M. & Farrell L. (Editors) (2005). The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

(d) Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM_{10}. However, they are considered to be less sensitive than the general public as a whole. This does not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.

(e) Except commercially sensitive horticulture.

Source: IAQM, 2024

Table A.3 Sensitivity of the area to dust soiling effects on people and property

Sensitivity of area	Number of receptors	Distance from the source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
High	10–100	High	Medium	Low	Low
High	1–10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

***Source**: IAQM, 2024*

Table A.4 Sensitivity of the area to human health effects from dust

Sensitivity of area	Annual mean PM_{10} (µg/m^3)	Number of receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
High	>32	>100	High	High	High	Medium	Low
		10–100	High	High	Medium	Low	Low
		1–10	High	Medium	Low	Low	Low
High	28–32	>100	High	High	Medium	Low	Low
		10–100	High	Medium	Low	Low	Low
		1–10	High	Medium	Low	Low	Low
High	24–28	>100	High	Medium	Low	Low	Low
		10–100	High	Medium	Low	Low	Low
		1–10	Medium	Low	Low	Low	Low
High	<24	>100	Medium	Low	Low	Low	Low
		10–100	Low	Low	Low	Low	Low
		1–10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low
		1–10	Medium	Low	Low	Low	Low
Medium	28–32	>10	Medium	Low	Low	Low	Low
		1–10	Low	Low	Low	Low	Low
Medium	24–28	>10	Low	Low	Low	Low	Low
		1–10	Low	Low	Low	Low	Low
Medium	<24	>10	Low	Low	Low	Low	Low
		1–10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Source: *IAQM, 2024*

Table A.5 Sensitivity of the area to ecological effects from dust

Receptor sensitivity	Distance from the source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Source: *IAQM, 2024*

Step 2c: Define the risk of dust effects matrix

A.1.9 The approach to assessing risks associated with fugitive dust emissions, as required by the guidance, is guided by the matrices shown in Table A.6 to Table A.8 (for demolition, earthworks and construction sources) and Table A.9 (for trackout sources).

Table A.6 Risk of dust effects – demolition

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible

***Source**: IAQM, 2024*

Table A.7 Risk of dust effects – earthworks

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

***Source**: IAQM, 2024*

Table A.8 Risk of dust effects – construction

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

***Source**: IAQM, 2024*

Table A.9 Risk of dust effects – trackout

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Negligible
Low	Low risk	Low risk	Negligible

***Source**: IAQM, 2024*

Step 3: Site-specific mitigation

A.1.10 The IAQM guidance provides a range of mitigation measures relating to the level of dust risk (low, medium or high) effect attributed to the Project.

Step 4: Significance of dust impacts

A.1.11 After successful implementation of the recommended IAQM mitigation measures, the significance of the potential residual impacts after implementation is determined by professional judgement. It is expected that with the implementation of further IAQM mitigation measures a potentially significant adverse dust impact will not occur, so the residual effect will normally be ‘not significant’.