11. AIR QUALITY

Introduction

11.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of Air Quality.

11.2 This chapter has been prepared by Entran Ltd. The work has been completed by Alison Banks (MSc, BSC (Hons), PG Dip) who is a Chartered Environmentalist and a member of the Institute of Air Quality Management (IAQM) and the Institute of Environmental Science (IES). Alison is an Associate with over 20 years' experience as an Environmental Consultant.

Policy Context

European Legislation

11.3 The European Union directive on ambient air quality and cleaner air for Europe (2008/50/EC)[i] sets legally binding limits for pollutant concentrations. This directive was made law in England through the Air Quality Standards Regulations 2010.

National Legislation

11.4 Part IV of the Environment Act 1995 places a duty on the Secretary of State for the Environment to develop, implement and maintain an Air Quality Strategy with the aim of reducing atmospheric emissions and improving air quality. The latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in 2007, and provides the framework for ensuring the air quality limit values are complied with based on a combination of international, national and local measures to reduce emissions and improve air quality. The Air Quality Strategy includes a statutory duty, also under Part IV of the Environment Act 1995, for local authorities to undergo a process of Local Air Quality Management (LAQM). This requires local authorities to regularly and systematically review and assess air quality within their boundaries against a series of objectives and appraise development and transport plans against these assessments.

Air Quality Strategy[ii]

11.5 The Air Quality Strategy published by the Department for Environment, Food and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality

management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the LAQM regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

National Planning Policy

National Planning Policy Framework[iii]

11.6 The revised National Planning Policy Framework (NPPF) published in February 2019 recognises air quality within Section 15: Conserving and enhancing the natural environment. The revised NPPF highlights that Developments should help improve the local environment, in terms of air quality wherever possible taking into account the relevant information.

11.7 To prevent unacceptable risks from air pollution, the revised NPPF states that:

> *'Planning policies and decisions should contribute to and enhance the natural and local environment by… preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air quality'.*
>
> and
>
> *'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.'*

11.8 More specifically on air quality, the revised NPPF states within paragraph 181 that:

> *'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*

on air quality 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.'

11.9 Paragraph 183 states that:

'The focus of planning polices 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.'

Planning Practice Guidance[iv]

11.10 National Planning Practice Guidance (PPG) has been developed in order to support the NPPF. The guidance provides a concise outline as to how air quality should be considered in order to comply with the NPPF and states that air quality is considered relevant to a planning application when:

'a development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies or action plans and / or breach legal obligations (including those relating for the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.'

11.11 The PPG further states:

'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 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; to 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.'*

Local Planning Policy

11.12 Medway Council's Local Plan[v] was adopted in May 2003. It contains the following policies with regards to air quality:

BNE2: Amenity Protection, which states:

'All development should secure the amenities of its future occupants, and protect those amenities enjoyed by nearby and adjacent properties. The design of development, should have regard to…noise, vibration, light, heat, smell and airborne emissions consisting of fumes, smoke, soot, ash, dust and grit.'

BNE24: Air Quality, which states:

'Development likely to result in airborne emissions should provide a full and detailed assessment of the likely impact of these emissions. Development will not be permitted when it is considered that unacceptable effects will be imposed on the health, amenity or natural environment of the surrounding area, taking into account the cumulative effects of other proposed or existing sources of air pollution in the vicinity.'

11.13 Medway Council are currently producing a new local plan. The new local plan will set out a vision for future development in Medway for the years 2019 to 2037. Draft policies have not yet been produced.

11.14 Medway Council have produced an Air Quality Action Plan which sets out the measures to reduce NO_2 concentrations within three AQMAs. Twelve key measures have been proposed as follows:

- Measure 1: Improving Movement of Freight;

- Measure 2: Encouragement of Public Transport Use;
- Measure 3: Improvement in Taxi Emissions;
- Measure 4: Traffic Management;
- Measure 5: Promotion of Cycling and Walking;
- Measure 6: Eco-Driving;
- Measure 7: Procurement;
- Measure 8: Travel Planning;
- Measure 9: Car Sharing;
- Measure 10: Development Planning;
- Measure 11: Promotion of Health and Air Quality Awareness; and
- Measure 12: Feasibility Studies and Funding.

Guidance

EPUK & IAQM Land Use Planning and Development Control

11.15 Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM) published the Land Use Planning and Development Control Air Quality guidance in January 2017[vi] to provide guidance on the assessment of air quality in relation to planning proposals and ensure that air quality is adequately considered within the development control process.

11.16 The main focus of the guidance is to ensure all developments apply good practice principles to ensure emissions and exposure are kept to a minimum. It also sets out criteria for identifying when a more detailed assessment of operational impacts is required, guidance on undertaking detailed assessments and criteria for assigning the significance of any identified impacts.

11.17 This guidance has been used within this assessment.

Assessment of Dust from Demolition and Construction

11.18 The IAQM published guidance in 2014 on the assessment of emissions from demolition and construction activities[vii]. The guidance sets out an approach to identifying the risk of impacts occurring at nearby sensitive receptors from dust generated during the construction process and sets out recommended mitigation measures based on the identified risk. This guidance has been used within this assessment.

A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites

11.19 The IAQM published guidance[viii] in May 2020 to provide advice on the assessment of air quality impacts of a development on designated conservation sites. This guidance has been used within this assessment.

Medway Council Air Quality Planning Guidance[ix]

11.20 Medway Council have produced an air quality planning guidance in conjunction with the Kent and Medway Air Quality Partnership. The guidance provides a method for quantifying the impacts of a proposed development, a method for calculating a damage cost and identifying appropriate mitigation measures.

Environmental Permitting Regulations & Best Available Techniques ('BAT') Reference Document for Waste Incineration ('BREF')[x]

11.21 Atmospheric emissions from industrial processes are controlled in the UK through the Environmental Permitting (England and Wales) Regulations 2016 (EPR). The Industrial Emissions Directive (IED) (Directive 2010/75/EU) (European Commission, 2010), was adopted on 7th January 2013, and is the key European Directive which covers almost all regulation of industrial processes in the EU. This was implemented into the UK through the EPR.

11.22 Within the IED, the requirements of the relevant sector BREF (Best Available Techniques Reference Document) become binding as BAT (Best Available Techniques) guidance. The Waste Incineration BREF was published by the European Commission in December 2019, this document provides an update to the BAT reference documents. It provides information on the process and general techniques used in the Waste Incineration sector, including information on the techniques used to minimise emissions. It provides a range of pollutant emissions that are considered achievable using Best Available Techniques and the limits in the BREF documents are more stringent than those currently set out in the IED.

Medium Combustion Plant Directive (MCPD)

11.23 The MCPD Directive (EU) 2015/2193[xi] published by the European Union in January 2018. The purpose of the MCPD is to reduce those emissions and the resultant risks to human health and the environment of certain pollutants into the air from Medium Combustion Plant. These are plant with a rated thermal input equal to or greater than 1 Megawatt thermal (MWth) and less than 50.

11.24 MCPD has been implemented in England under Schedule 25A of the Environmental Permitting Regulations.

Assessment Methodology

11.25 The Development may introduce the following air quality effects:

- During the construction phase, suspended and re-suspended fugitive dust emissions from demolition / construction activities and vehicular emissions from construction traffic, including re-suspended dust from heavy duty vehicle (HDV) movements; and
- During the operational phase, vehicular emissions (primarily nitrogen dioxide (NO2) and particulate matter (PM10 and PM2.5)) from increased traffic movements associated with the Development and emissions arising from the possible Energy from Waste (EfW) plant.

11.26 The potential effects of the Development on local air quality during both construction and operational phases have been assessed. For both phases, the type, source and significance of potential effects are identified and the measures that should be employed to minimise these effects are described.

11.27 A glossary of common air quality terminology is provided in Appendix 11.1.

Consultation

11.28 An EIA scoping exercise was carried out to inform the assessment. The proposed approach to the assessment of the likely significant effects of the Development on air quality follows the guidance provided in Medway Council's Air Quality Planning Guidance and was agreed in consultation with the Environmental Health Officer (EHO) of Medway Council. Correspondence with the EHO of Medway Council is included in Appendix 11.2.

Scope of Assessment

11.29 The scope of the assessment has been determined as follows:

- Review of air quality data for the area surrounding the Site and background pollutant maps;
- Review of the Development details (as detailed in Chapter 3 Site and Development Description and Chapter 5 Construction Methodology and Sequencing of the ES);
- Review of the traffic flow data, which has been used as an input to the air quality

modelling assessment;

- Review of the data for an EfW plant that could, potentially, come forward within the parameters of the outline planning application. Whilst flexible commercial uses are proposed, with energy only being one possibility, this has been considered as the "worst case" use in terms of emissions to air. This has also been used as an input to the air quality assessment so that the likely significant effects of the outline application have been assessed as robustly and conservatively as practicable at this stage; and
- Review of information relating to committed developments in the vicinity of the Site (which are set out in Chapter 2 EIA Methodology of the ES).

11.30 Based on the Department of Transport thresholds for transport assessments set out in Appendix 2 of Medway Council's Air Quality Planning Guidance, the Development is classed as 'major' development. Following a review of the Development against checklist 1 and checklist 2 within the guidance, it is concluded that an air quality assessment and emissions mitigation assessment is required.

11.31 There is the potential for impacts on local air quality during both the construction and operational phases of the Development. During the construction phase, there is the potential for impacts to occur as a result of dust and PM_{10} emissions from on-Site activities. Guidance provided by the IAQM includes the following criteria for assessing the effects of construction dust:

- A sensitive 'human receptor' within 350m of the site boundary or within 50m of the route used by construction vehicles on public highways up to 500m from the site entrance; and/or
- A sensitive 'ecological receptor' within 50m of the site boundary or within 50m of the route used by construction vehicles on the public highway, up to 500m from the site entrance.

11.32 There are no residential properties or other human receptors sensitive to dust and particulate matter located within 350m of the Site boundary or along the most likely route to be used by construction traffic. Medway Estuary & Marshes SPA, SSSI and Ramsar site, is located within 50m of the Site boundary. An assessment of construction phase impacts of dust and particulate matter on ecological receptors has therefore been included in this assessment.

11.33 During the operational phase, there is the potential for impacts on local air quality to occur as a result of emissions from road vehicle trips generated by the operation of the Development. Guidance provided by the IAQM & EPUK provides threshold criteria for

establishing when significant impacts on local air quality may occur and when a detailed assessment of potential impacts is required. At locations outside an AQMA, a change in light duty vehicles (LDV) of more than 500 per day and / or a change in HDVs of more than 100 per day is considered to result in potentially significant impacts on air quality. At locations within or adjacent to an AQMA, a change in LDVs of more than 100 per day and / or a change in HDVs of more than 25 per day is considered potentially significant.

11.34 The Site is not located within or near to an AQMA. Data provided by the project transport consultants estimates that the Development is likely to result in a change in both LDVs and HDVs in excess of the threshold values on a number of road links. An assessment of impacts arising from vehicle emissions using the local roads has therefore been included in the assessment. The data provided also indicates that the number of HDVs associated with the construction works is likely to be above the threshold level for a number of links. An assessment of impacts arising from vehicle emission during the construction phase has also been included.

11.35 During the operational phase, there is also the potential for impacts on local air quality to occur as a result of emissions from the possible EfW plant. An assessment of impacts arising from the emissions of the plant has also been included. This plant will be subject to the requirements of EPR and an application will have to be made to the Environment Agency (EA) to operate the plant, this application will include detail on the impacts to air from the possible EfW plant.

11.36 Details of the energy producing plant would be determined at the detailed design stage of the Development. Therefore, the assessment includes an assessment of emissions from an EfW plant of 49.9MW which is considered to be the worst-case scenario of the possible energy uses that could be developed pursuant to the outline consent within the parameters that define the outline application. As the parameters do not constrain the location of uses on the Site, the assessment includes the consideration of the plant located in three worst-case locations with regards to the surrounding sensitive receptors within the Site in accordance with the acceptable locations identified within the Parameter Plan included (Figure 3.2 of the ES). The results presented in this chapter are the worst predicted concentrations at each receptor for all three of the stack locations modelled. This represents a realistic 'worst case' scenario for the purposes of this assessment.

11.37 In addition to an EfW plant, it is likely that Data Centre uses may include the provision of a number of backup generators that would be required to provide power to the data centre in the event of a power failure. The backup generators would only be used in an emergency situation and during routine maintenance testing, which is likely to be monthly for a period

of 1 to 2 hours for each test. It is therefore considered extremely unlikely that the short-term air quality objectives will be breached. Detailed assessment of the backup generators has therefore been excluded from the assessment. It is likely that these back-up generators will need to comply with the requirements of the Medium Combustion Plant Directive and a permit application will need to be made to the EA to operate this plant. This permit application will detail the impacts to air from these back-up generators.

11.38 Details of the assessment methodology and the specific issues considered are provided below.

Construction Phase Methodology

11.39 To assess the potential impacts associated with dust and PM_{10} releases during the construction phase and to determine any necessary mitigation measures, an assessment based on the latest guidance from the IAQM has been undertaken.

11.40 This approach divides construction activities into the following dust emission sources:

- demolition;
- earthworks;
- construction; and
- trackout.

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

11.42 The significance of the dust effects is based on professional judgement, taking into account the sensitivity of receptors and existing air quality.

Dust Emission Magnitude

11.43 The magnitude of the dust impacts for each source is classified as Small, Medium or Large depending on the scale of the proposed works. Table 11.1 summarises the IAQM criteria that may be used to determine the magnitude of the dust emission. These criteria are used in combination with site specific information and professional judgement. It should be noted that the guidance states that in each case not all the criteria need to be met and that other criteria may be used if justified in the assessment.

Table 11.1: Dust Emission Magnitude Criteria

Source	Large	Medium	Small
Demolition	• Total building volume >50,000m^3 • Potentially dusty material (e.g. concrete) • Onsite crushing and screening Demolition activities >20m above ground level.	• Total building volume 20,000 - 50,000m^3 • Potentially dusty material Demolition activities 10 - 20m above ground level.	• Total building volume <20,000m^3 • Construction material with low potential for dust release • Demolition activities <10m above ground level Demolition during wetter months
Earthworks	• Total site area >10,000m^2 • Potentially dusty soil type (e.g. clay) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >8m in height Total material moved >100,000 tonnes	• Total site area 2,500 -10,000m^2 • Moderately dusty soil type (e.g. silt) • 5 - 10 heavy earth moving vehicles active at any one time • Formation of bunds 4 - 8m in height Total material moved 20,000 - 100,000 tonnes	• Total site area <2,500m^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 • Total material moved <20,000 tonnes Earthworks during wetter months
Construction	• Total building volume >100,000m^3 • On site concrete batching Sandblasting	• Total building volume 25,000 - 100,000m^3 • Potentially dusty construction material (e.g. concrete) On site concrete batching	• Total building volume <25,000m^3 Material with low potential for dust release (e.g. metal cladding or timber)
Trackout	• >50 HDV movements in any one day (a) • Potentially dusty surface material (e.g. high clay content) Unpaved road length >100m	• 10 - 50 HDV movements in any one day (a) • Moderately dusty surface material (e.g. silt) Unpaved road length 50 - 100m	• <10 HDV movements in any one day (a) • Surface material with low potential for dust release Unpaved road length <50m
(a) HDV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes.			

Receptor Sensitivity

11.44 Factors defining the sensitivity of a receptor are presented in Table 11.2.

Table 11.2: Factors Defining the Sensitivity of a Receptor

Sensitivity	Human (health)	Human (Dust Soiling)	Ecological
High	• Locations where members of the public	• Regular exposure	• Nationally or Internationally

Sensitivity	Human (health)	Human (Dust Soiling)	Ecological
	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.	• 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.	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) • Examples include office and shop workers (d)	• Short-term exposure • Moderate level of amenity expected • Possible diminished appearance or aesthetics of property due to dust soiling • Examples include parks and places of work	• Nationally designated site with dust sensitive features (b) • Nationally designated site with a particularly important plant 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 objectives, 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) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.
(d) Does not include workers exposure to PM_{10} as protection is covered by Health and Safety at Work legislation.
(e) Except commercially sensitive horticulture.

11.45 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 impacts from nearby construction sites, any pre-existing screening such as trees or buildings and the likely duration of the impacts. In addition, the influence of the prevailing wind direction and local topography may be of relevance when determining the sensitivity of a receptor.

Area Sensitivity

11.46 The sensitivity of the area to dust soiling and health impacts is dependent on the number of receptors within each sensitivity class and their distance from the source. In addition, human health impacts are dependent on the existing PM_{10} concentrations in the area. Tables 11.3 and 11.4 summarise the criteria provided in the IAQM guidance for determining the overall

sensitivity of the area to dust soiling and health impacts respectively. Table 11.5 summarises the criteria for determining the sensitivity of an area to ecological impacts.

Table 11.3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the source (a)			
		<20m	<50m	<100m	<350m
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

(a) For trackout, the distance is measured from the side of roads used by construction traffic. Beyond 50m, the impact is negligible.

Table 11.4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM10 (µg/m3)	Number of Receptors	Distance from the source (a)				
			<20m	<50m	<100m	<200m	<350m
High	> 32	> 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32	> 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28	> 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	< 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
	28-32	> 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	<28	-	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

(a) For trackout, the distance is measured from the side of roads used by construction traffic. Beyond 50m, the impact is negligible.

Table 11.5: Sensitivity of Area to Ecological Impacts

Sensitivity of Area	Distance from the Source	
	<20m	<50m
High	High Risk	Medium Risk
Medium	Medium Risk	Low Risk
Low	Low Risk	Low Risk

11.47 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 impacts.

Risk of Dust Impacts

11.48 The risk of dust impacts prior to mitigation for each emission source is presented in Tables 11.6, 11.7 and 11.8.

Table 11.6: Risk of Dust Impacts – 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

Table 11.7: Risk of Dust Impacts – Earthworks and Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 11.8: Risk of Dust Impacts - Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Construction Traffic

11.49 Construction traffic will contribute to existing traffic levels on the surrounding road network. The greatest potential for impacts on air quality from traffic associated with this phase of the Development will be in the areas immediately adjacent to the principal means of access for construction traffic.

11.50 The proposed opening year for the Development is 2031. The 'worst case' traffic with regards to combined construction and operational Development trips will be the year 2030, where the Development will be partly operational with construction still ongoing. Combined construction and operational Development trips have been calculated for this year. As existing traffic flows are only available for the years 2028 and 2037, the combined construction and operational Development trips have been added to 2028 traffic flows. The assessment for combined construction phase and operational phase traffic impacts follows the methodology outlined below for the operational traffic.

Operational Phase Methodology

11.51 Air quality at the Site has been predicted using both the ADMS Roads Extra dispersion model (Version 5.0.0.1, March 2020). This is a commercially available dispersion model and has been widely validated for this type of assessment and used extensively in the Air Quality Review and Assessment process.

Traffic Emissions Modelling

11.52 The ADMS Roads model uses detailed information regarding traffic flows on the local road network and local meteorological conditions to predict pollution concentrations at specific locations selected by the user. Meteorological data from Gravesend Meteorological Station has been used for the assessment.

11.53 The model has been used to predict road specific concentrations of oxides of nitrogen (NOx) and Particulate Matter (PM_{10} and $PM_{2.5}$) at selected receptors in the vicinity of the surrounding road network and within the Development itself. The predicted concentrations of NOx have been converted to nitrogen dioxide (NO_2) using the NOx to NO_2 calculator available on the Defra air quality website[xii].

11.54 Traffic data has been provided by the project Transport Consultants. A summary of the traffic data used in the assessment can be found in Appendix 11.3. The data includes details of

annual average daily traffic flows (AADT), vehicle speeds and percentage HDV for the assessment years considered. Low traffic speeds have been assigned to appropriate road links to account for congestion and queuing vehicles.

11.55 The following scenarios have been included in the assessment:

- 2019 – Baseline Traffic (for verification purposes);
- 2037 – Future Baseline Traffic plus committed developments (hereafter referred to as 'without development' scenario);
- 2037 – Future Baseline Traffic plus committed developments plus Development Traffic (hereafter referred to as 'with development' scenario);
- 2028 – Future Baseline Traffic with proposed Highways Infrastructure plus committed developments (hereafter referred to as 'without development including HIF' scenario); and
- 2028 – Future Baseline Traffic with proposed Highways Infrastructure plus committed developments plus Development Traffic (hereafter referred to as 'with developments including HIF scenario).

11.56 The proposed opening year of the Development is the year 2031. Traffic flows are only available for the year 2037 and 2028, 2037 for the scenario without the Highways Infrastructure scheme (HIF) scheme and 2028 for the scenario with the HIF scheme. Although the Development will not be open in the year 2028, as a worst-case assessment, the flows associated with the Development in the opening year have been added to the flows for this year. It should be noted that the results of the assessment with and without the HIF scheme are therefore not directly comparable due to the different assessment years.

11.57 The emission factors released by Defra in November 2020, provided in the emissions factor toolkit EFT2020_10.0 have been used to predict traffic related emissions in 2019, 2037 and 2028 (the assessment year of the HIF scheme).

11.58 To predict local air quality, traffic emissions predicted by the model must be added to local background concentrations. Background concentrations for 2019 have been used to predict concentrations in 2037 and 2028 assuming no change in future years. This represents a conservative prediction of future concentrations.

11.59 To determine the performance of the model at a local level, a comparison of modelled results with the results of monitoring carried out within the study area was undertaken. This process aims to minimise modelling uncertainty and systematic error by correcting the modelled

results by an adjustment factor to gain greater confidence in the final results. This process was undertaken using the methodology outlined in Chapter 7, Section 4 of LAQM.TG(16). Full details of the model verification process are presented in Appendix 11.4.

11.60 An overall verification factor of 3.38 was determined which indicates that the model is under predicting compared to the monitored concentrations in this area. The modelled NOx concentrations were adjusted using this factor prior to conversion to NO_2 using the NOx to NO_2 calculation tool available on Defra's website.

11.61 Local roadside monitoring data were not available for concentrations of PM_{10} and $PM_{2.5}$. Modelled PM_{10} and $PM_{2.5}$ concentrations have therefore been adjusted by the verification factor obtained for NOx, which is consistent with the guidance provided in LAQM.TG(16).

11.62 LAQM.TG(16) does not provide a method for the conversion of annual mean NO_2 concentrations to 1-hour mean NO_2 concentrations. However, research[xiii] has concluded that exceedances of the 1-hour mean objective are generally unlikely to occur where annual mean concentrations do not exceed 60 µg/m^3. For robustness, locations where the 1-hour mean objective is relevant are included in the assessment.

Modelling Emissions from Energy Generating Plant

11.63 The impact of emissions arising from the possible EfW plant has been assessed using the ADMS Extra dispersion model (Version 5.0.0.1, March 2020). The dispersion modelling has been carried out using five years of hourly sequential meteorological data from Gravesend in order to take account of inter-annual variability and reduce the effect of any atypical conditions.

11.64 Emission limits from the Best Available Techniques (BAT) Reference Document for Waste Incineration (BREF) have been assumed for the purposes of modelling the possible EfW plant. For emissions of dust, HCl, HF, SO_2, NOx, CO and TOCs, the BREF document provides emission limit concentrations that have been determined for daily averaged periods. For concentrations of PM_{10}, HCl, HF, SO_2, NO_2, CO and TOC air quality standards also exist for shorter time periods i.e. hourly, 8 hour and 15 minute mean periods. In order to ensure a worst-case assessment, for the purposes of predicting concentrations for averaging periods of less than one day, emission limits have been taken from the Industrial Emissions Directive (IED) [xiv]. The plant is assumed to be operating continuously at full load. Typical stack emission parameters (flow rate, temperature etc.) for such plant have been used in the assessment. The input data to the model is provided in Appendix 11.5.

11.65 For the Group III trace metal predictions, it has been assumed in accordance with the EA's metals guidance[xv] that each of the metals is emitted at the maximum level as a worst case. The same approach has also been adopted for the Group I and II metals. Where the screening criteria set out in the guidance are not met, emission concentrations provided in the EA guidance note, which have been derived from measured data, have been used to further assess these pollutants as specified in the guidance note.

11.66 The assessment presented in this chapter is therefore for an EfW plant up to 49.9MW. The data used in this assessment is based on worst case assumptions and emission limits.

Topography

11.67 The presence of elevated terrain can significantly affect the dispersion of pollutants by increasing turbulence and reducing the distance between the plume centre line and the ground level. However, as the topography in the vicinity of the Site is relatively flat, it was not necessary to consider the impact of terrain on the dispersion of emissions.

Building Downwash / Entrainment

11.68 The presence of buildings close to emission sources can significantly affect the dispersion of pollutants by leading to a phenomenon called downwash. This occurs when a building distorts the wind flow, creating zones of increased turbulence. Increased turbulence causes the plume to come to ground earlier than otherwise would be the case and result in higher ground level concentrations closer to the stack.

11.69 Downwash effects are only significant where building heights are greater than 30% to 40% of the emission release height. The downwash structures also need to be sufficiently close for their influence to be significant. Relevant structures have been included in the modelling.

NO_x to NO_2 Conversion

11.70 Oxides of nitrogen (NOx) emitted to atmosphere as a result of combustion will consist largely of nitric oxide (NO), a relatively innocuous substance. Once released into the atmosphere, NO is oxidised to NO_2. The proportion of NO converted to NO_2 depends on a number of factors including wind speed, distance from the source, solar irradiation and the availability of oxidants, such as ozone (O_3).

11.71 A conversion ratio of 70% NOx:NO_2 has been assumed for comparison of predicted concentrations with the long-term objectives for NO_2. A conversion ratio of 35% has been

utilised for the assessment of short-term impacts, as recommended by EA guidance[xvi].

11.72 A quantitative assessment of air quality at and around the Site has been completed against the relevant Air Quality Assessment Levels (AQALs which comprise AQS objective levels and Environmental Assessment Levels (EAL)) set out in Appendix 11.6.

Sensitive Human Health Receptors

11.73 LAQM.TG(16) describes in detail typical locations where consideration should be given to pollutants defined in the Air Quality Regulations (2000). Generally, the guidance suggests that all locations *'where members of the public are regularly present'* should be considered. At such locations, members of the public will be exposed to pollution over the time that they are present, and the most suitable averaging period of the pollutant needs to be used for assessment purposes.

11.74 For instance, on a footpath, where exposure will be transient (for the duration of passage along that path) comparison with short-term standard (i.e. 15-minute mean or 1-hour mean) may be relevant. In a school, or adjacent to a private dwelling, however; where exposure may be for longer periods, comparison with long-term (annual mean) standards may be most appropriate. In general terms, concentrations associated with long-term standards are lower than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time.

11.75 To assess the likely impact of the emissions arising from the traffic associated with the Development and emissions from the energy plant, pollutant concentrations have been predicted at a number of sensitive receptors in the vicinity of the Site. Details of these sensitive receptors are presented in Table 11.9 and presented in Figure 11.1. As the location of buildings within the Site will be determined in the detailed design stage, concentrations within the Site were determined by modelling a grid across the Site.

Table 11.9: Location of Sensitive Human Receptors

ID	Receptor	Type	Easting	Northing
R1	Burnt House Farm	Residential	580288	172393
R2	Abbots Court Nursing Home, Saxon Shore Way	Residential	579373	172152
R3	Property on Jacobs Lane	Residential	580024	172707
R4	8 Sturdee Cottages	Residential	579241	172929
R5	2 Beluncle Farm Cottages	Residential	580111	173376
R6	1 Stoke Cottages, Tunbridge	Residential	580514	173955

R7	White Hall Farm House	Residential	580870	173930
R8	Property on Stoke Road	Residential	581224	174207
R9	Property on Stoke Road near r/way	Residential	581579	174000
R10	The Lodge, Tudor Farm	Residential	581638	174563
R11	Dingley Dell, Dickenson Close, Upper Stoke	Residential	582355	174957
R12	Yew Tree Lodge Elderly Residential Care	Residential	578961	172732
R13	Damhead Creek Power Station	Short Term	581038	172771
R14	Nearest building in commercial park	Short Term	580862	172871
R15	Building in commercial park	Short Term	581147	173291
R16	Amazon Building	Short Term	581884	173657
R17	1 Primrose Cottages, Ratcliffe Highway	Residential	578533	173928
R18	Neyfyn House	Residential	577761	173334
R19	1a Haig Villas, Chattenden	Residential	576329	172085
R20	11 Linnet Close, Chattenden	Residential	576210	172078
R21	2 Broadwood Road, Chattenden	Residential	575975	171833
R22	1 Hill Court, Chattenden	Residential	575810	171797
R23	21 ESS	Residential	575752	171974
R24	23 Gold Drive, Wainscott	Residential	574860	171440
R25	58 Higham Road, Wainscott	Residential	574580	171365
R26	58 Leigh Road, Wainscott	Residential	574294	171119
R27	25 Fordwich Drive, Wainscott	Residential	573363	170843
R28	4 Copperfield Crescent, Higham	Residential	571213	170737
R29	1 The Paddock, off A226 Higham	Residential	570817	171076
R30	South Lodge, Gravesend Road, Rochester	Residential	572190	170460
R31	152 Gravesend Road, Rochester	Residential	572473	170150
R32	1 Squirrels Close, Rochester (near motorway)	Residential	570749	169368
R33	37 The Spires, Rochester	Residential	571643	168282
R34	10 Omaha Place, off Hoo Road, Wainscott	Residential	575031	171310
R35	23 Hollywood Lane, Wainscott	Residential	574651	171064
R36	86 Hollywood Lane, Wainscott	Residential	574113	170877
R37	32 Bogarde Drive, Wainscott	Residential	573770	170839
R38	99 Cooling Road, Wainscott	Residential	573956	170594
R39	83 Bill Street Road, Wainscott	Residential	574000	170001
R40	54 Spire Way, Wainscott	Residential	575041	170956
R41	Frindsbury Hall Nursing Home	Residential	574333	170168

R42	163 Findsbury Road, Wainscott	Residential	574204	170068
R43	1 Pond Cottage, off Berwick Way	Residential	574855	170262
R44	12 Pier Road, Gillingham	Residential	577931	169279
R45	40 Pier Road, Gillingham	Residential	578091	169232
R46	37 Gads Hill, Gillingham	Residential	578857	168971
R47	30 Odo Rise, Gillingham	Residential	579466	168306

Assessment of Likely Significant Effects on Ecologically Sensitive Sites

11.76 The EA guidance[xvii] states that the impact of emissions to air on vegetation and ecosystems should be assessed for Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites (protected wetlands) within 10km of the Site and SSSIs, Local Nature Sites (including ancient woodland, local wildlife sites and national and local nature reserves) within 2km of the Site. Details of the ecological sites within these distances are presented in Table 11.10.

Table 11.10: Location of Sensitive Ecological Receptors

Ecological Habitat	Habitat Type	Approximate Location relative to the Site
Medway Estuary & Marshes Ramsar Site / SPA / SSSI	Intertidal mudflats and saltmarshes	Borders Site to west and south
Thames Estuary & Marshes Ramsar Site / SPA	Mudflats, saltmarshes and grazing marshes	6.4km to north of Site
Queensdown Warren SAC	Dry grassland and scrubland	9.5km to south of Site
Chattenden Woods and Lodge Hill SSSI	Ancient woodland, scrub & grassland	Approx. 3km to west of Site. Part of SSSI lies within 200m of road affected by traffic generated by the Development (A228)

11.77 The ecologically sensitive sites have been represented in the model using a grid across each site to enable the maximum impact within each site to be determined.

11.78 The modelled ground level pollutant concentrations are used to predict deposition rates using typical deposition velocities. A summary of typical dry deposition velocities is presented in Table 11.11 below.

Table 11.11: Dry Deposition Velocity (m/s)

Pollutant	Grassland	Woodland
Nitrogen Dioxide (NO_2)	0.0015	0.0030
Sulphur Dioxide (SO_2)	0.012	0.024
Ammonia (NH_3)	0.02	0.03
Hydrogen Chloride (HCl)	0.025	0.06

11.79 The predicted nitrogen deposition rates assume a 100% NOx: NO_2 conversion. This represents

a worst-case for the assessment since NO has a lower deposition velocity than NO_2 and consequently results in lower deposition rates.

11.80 Predicted ground level concentrations and acidification/ deposition rates are compared with relevant air quality standards, critical levels and critical loads for the protection of sensitive ecosystems and vegetation (see Appendix 11.7).

Limitations and Assumptions

11.81 Information regarding the likely energy generating plant to be included in the Development was only indicative at the time of assessment. Realistic worst-case plant assuming a maximum plant size of 49.9MW of energy generating capacity and three possible locations for the Stack within the Site in accordance with the Parameter Plan (Figure 3.2 of the ES) have been modelled.

Significance Criteria

Construction Phase

11.82 The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity following the application of appropriate mitigation measures. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effects will normally be negligible.

Operational Phase (and Construction Traffic)

11.83 The significance of the predicted impacts has been determined using the guidance set out within the Medway Council Air Quality Planning Guidance. In the first instance the change in pollutant concentrations as a result of the Development is calculated as a percentage of the relevant objective limit. The impact is then classified according to the criteria set out in Table 11.12 below.

11.84 Following classification of the impacts the guidance recommends the actions set out in the Table 11.13 based on the identified impact.

Table 11.12: Classification of impacts due to changes in pollutant concentrations

Classification of Impact	Concentration change due to Development	Or if development contribution causes
Very High	Increase >10%	Worsening of air quality within an existing AQMA Creation of a new AQMA Introduction of new receptors within an existing AQMA
High	Increase 5-10%	Levels to be within 5% AQO
Medium	Increase 1-5%	Levels to be within 10% AQO
Low / Imperceptible	Increase <1%	-

Table 11.13: Recommended Planning Requirements

Magnitude of change in air quality	Likely requirement	Likely Outcome
Very High	Require evidence to show that mitigation will cancel out air quality impacts. If impact of development on air quality still very high = strong presumption for recommendation for refusal on air quality grounds	Recommend Refusal
High	Seek mitigation to significantly reduce air quality impacts. Mitigations to include reducing exposure through various measures, emissions reduction technologies and/or development redesign	Recommend Refusal unless significant mitigation measures are implemented.
Medium	Seek mitigation to reduce air quality impacts. Mitigations to include reducing exposure through various measures, emissions reduction technologies and/or development redesign	Ensure mitigation is implemented.
Low/ Imperceptible	Recommend the minimum mitigation for development scheme type	Ensure minimum mitigation is implemented

11.85 Consideration is also given to the significance criteria provided in the EPUK & IAQM planning guidance. The guidance recommends that the impact at individual receptors is described by expressing the magnitude of incremental change in pollution concentration as a proportion of the relevant assessment level and examining this change in the context of the new total concentration and its relationship with the assessment criterion as summarised in Table 11.14.

Table 11.14: Impact Descriptors for Individual Receptors

Long Term Average Concentration at Receptor in Assessment Year	% Change in concentration relative to AQAL (a)			
	1	2-5	5-10	>10
75% or less of AQAL	Negligible	Negligible	Slight adverse	Moderate adverse
76-94% of AQAL	Negligible	Slight adverse	Moderate adverse	Moderate adverse
95-102% of AQAL	Slight adverse	Moderate adverse	Moderate adverse	Substantial adverse

103-109% of AQAL	Moderate adverse	Moderate adverse	Substantial adverse	Substantial adverse
110% or more of AQAL	Moderate adverse	Substantial adverse	Substantial adverse	Substantial adverse
(a) a change in concentration of less than 0.5% of the AQAL is considered insignificant, however changes between 0.5% and 1% are rounded up to 1%.				

11.86 The EPUK & IAQM guidance notes that the criteria in Table 11.14 should be used to describe impacts at individual receptors and should be considered as a starting point to make a judgement on significance of effects, as other influences may need to be accounted for. The EPUK & IAQM guidance states that the assessment of overall significance should be based on professional judgement, taking into account several factors, including:

- The existing and future air quality in the absence of the proposed development;
- The extent of current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

11.87 The EPUK & IAQM guidance also provides significance criteria for short term impacts which are defined for averaging periods of 1-hour or less. The EPUK & IAQM guidance states that for point sources short-term impacts of less than 10% of the AQAL are described as 'insignificant', regardless of existing air quality. Where the short-term process concentrations are 11% to 20% of the AQAL the severity of the impact is described as 'slight'. Impacts of 21% to 50% and over 51% are described as 'moderate' and 'substantial', respectively.

11.88 In order to determine whether the impacts at ecological habitats are significant, the EA guidance criteria have been used. These are outlined in Table 11.15 below.

Table 11.15: Significance Criteria for Ecological Sites

Ecological Habitat	Stage One	Stage Two
SPAs, SACs, Ramsar sites or SSSIs	The impact is considered insignificant if: • the short-term PC is less than 10 % of the short-term; and • the long-term PC is less than 1 % of the long-term environmental standard.	The impact is considered to be insignificant if: • Long term PC >1% and predicted environmental concentrations (PEC) <70% of the long term critical level.
Local Nature Sites (ancient woodlands, local wildlife sites, national and local nature reserves)	The impact is considered to be insignificant if: • Short term PC <100% short term critical level; and • Long term PC < 100% long term critical level	

11.89 The EA criteria are intended to screen emissions in order to determine if the impacts are

significant. If the screening criteria are exceeded, advice should be sought from a suitably qualified ecologist to determine if the impact is likely to be significant as a result of the sensitivity of the individual habitat to the relevant pollutants.

11.90 The IAQM guidance for the assessment of ecological habitats, suggests that local natures sites should be treated the same as SSSIs and European sites.

Baseline Conditions

Medway Council Review and Assessment of Air Quality

11.91 The Council has carried out detailed assessments of air quality in the area and as a result has declared four areas as Air Quality Management Areas (AQMAs). The Site is not located within or close to an AQMA. The nearest AQMAs are Four Elms Hill AQMA and Gillingham AQMA. Four Elms Hill AQMA was declared in 2017 for annual mean NO_2 concentrations. It is located along Four Elms Hill in Chattenden, which is approximately 4km to the west of the Site. The Gillingham AQMA was declared in 2010 for annual mean NO_2 concentrations. It is located along Pier Road in Gillingham, approximately 3.6km to the southwest of the Site.

Sources of Air Pollution

11.92 The Site is surrounded by a mixture of industrial areas and agricultural fields. Immediately to the south of the Site is the River Medway Estuary. Immediately adjacent to the northern part of the Site is Damhead Creek Combined Cycle Gas Turbine (CCGT) Power Station (Drax Power Station) and beyond this is the Kingsnorth Industrial Estate.

Local Monitoring Data

Nitrogen Dioxide

11.93 MC operates two automatic monitoring stations within its area. The closest is Rochester Stoke, which is an AURN site in a rural location approximately 3.4km to the northeast of the Site. A summary of five recent years of NO_2 monitoring at this monitoring site is provided in Table 11.16 and Table 11.17 respectively.

Table 11.16: Annual Mean NO_2 Concentrations – Automatic Monitoring Stations ($\mu g/m^3$)

Site Name	Type	2015	2016	2017	2018	2019
Rochester Stoke	Rural	13.0	13.3	14.7	13.0	12.3

Source: Medway Council Annual Status Report 2020

Table 11.17: Number of Exceedances of the NO_2 1-Hour Mean Objective – Automatic Monitoring Stations

Site Name	2015	2016	2017	2018	2019
Rochester Stoke	0	0	0	0	0

Source: Medway Council Annual Status Report 2020

11.94 The results of automatic NO_2 monitoring at the nearest continuous monitor show that NO_2 concentrations have been below the annual mean objective of $40\mu g/m^3$ at this rural location for all the years presented. No exceedances of the 1-hour mean objective for NO_2 of $200\mu g/m^3$ have been measured.

11.95 The Council also operates a network of passive NO_2 diffusion tubes. The closest tubes to the Site are located at roadside locations within the Four Elms Hill and Gillingham AQMAs to the west and south of the Site. At these locations, the air quality will not be typical of the background concentrations in the vicinity of the Site, however for completeness a summary of the diffusion tube monitoring data at the nearest locations are presented in Table 11.18.

Table 11.18: NO_2 Diffusion Tube Monitoring (bias adjusted, $\mu g/m^3$)

ID	Type	OS Grid Reference	2015	2016	2017	2018	2019
DT13	Rural	583152, 176305	17.0	12.2	13.8	13.1	13.1
DT24	Kerbside	575948, 171847	52.0	50.9	50.8	47.4	53.2
DT33	Roadside	575971, 171833	-	-	43.5	41.6	42.0
DT32	Roadside	575903, 171802	-	-	47.5	46.3	43.1
DT22	Roadside	575488, 171616	31.0	29.0	31.0	28.0	27.2
DT23	Roadside	575044, 171351	24.7	27.0	25.3	29.0	24.4
DT21	Roadside	574999, 171882	21.5	23.4	22.4	21.4	19.9
DT27	Roadside	577880, 169319	37.6	33.5	39.1	35.6	34.1
DT25	Roadside	577908, 169285	37.6	36.5	42.9	37.9	35.8
DT26	Roadside	578007, 169262	25.8	33.6	28.1	27.9	24.4

Source: Medway Council Annual Status Report 2020

11.96 The diffusion tube monitoring data presented in Table 11.16 above shows that the annual mean air quality objective of $40\mu g/m^3$ was exceeded at roadside monitoring stations DT24, DT33, DT32 which are located within the Four Elms Hill AQMA and in 2017 at DT25 which is located in the Gillingham AQMA.

11.97 The annual mean air quality objective was met at the rural diffusion tube, which is co-located with the automatic continuous monitor Rochester Stoke.

11.98 Additional information on background concentrations in the vicinity of the Site have been obtained from the Defra background pollutant maps. The 2018 Defra background maps provide estimated concentrations for the years 2018 to 2030. The average background concentration across the Site and surrounding area in 2019 was 12.8µg/m^3. This shows a good correlation with the concentrations measured at the Rochester Stoke monitoring site.

11.99 The road network included in the roads model cover a large area and there is much variation in the background concentration across the study area. As discussed previously, a key source of air pollution in the vicinity of the Site is the Damhead Creek CCGT Power Station which is located immediately adjacent to the northern section of the Site. Review of the background concentrations obtained for the grid squares surrounding the Site indicate that the background concentration for the grid square containing the Damhead Creek CCGT Power Station is slightly elevated in comparison to the surrounding grid squares. It is therefore considered that the contribution to NO_2 levels as a result of the emissions from the Damhead Creek CCGT Power Station is incorporated into the background concentrations for the surrounding area.

11.100 In order to account for the variation in background concentrations across the study area, background concentrations for individual receptors have been determined. Background concentrations obtained from the Defra background maps for each grid square that has been used in the modelling are illustrated in Table 11.19 below.

Table 11.19: Estimated Annual Mean Background Concentrations from Defra Maps (µg/m^3)

Grid Square	Relevant Receptor	NO_2
580500, 172500	R1, R3, R14	13.2
579500, 172500	R2, R4	12.9
580500, 173500	R5, R6, R7,	13.2
581500, 174500	R8, R9, R10,	12.2
582500, 174500	R11,	12.0
578500, 172500	R12	13.8
581500, 172500	R13	12.3
581500, 173500	R15, R16	12.3
578500, 173500	R17	14.3
577500, 173500	R18	14.6
576500, 172500	R19, R20,	15.3
575500, 171500	R21, R22, R23	17.4
574500, 171500	R24, R25, R26	17.4
573500, 170500	R27	17.4
571500, 170500	R28	18.7
570500, 171500	R29	14.7
572500, 170500	R30, R31,	16.8

570500, 169500	R32	22.7
571500, 168500	R33	20.5
575500, 171500	R34	17.4
574500, 171500	R35	17.4
574500, 170500	R36, R39, R41, R42, R43	17.2
573500, 170500	R37, R38	17.4
575500, 170500	R40	16.2
577500, 169500	R44	20.0
578500, 169500	R45	16.2
578500, 168500	R46	16.4
579500, 168500	R47	15.5

Particulate Matter

11.101 A summary of annual mean PM_{10} concentrations measured at the Rochester Stoke automatic monitoring stations from 2015 to 2019 is presented in Table 11.20. The number of exceedances of the 24-hour mean objective is presented in Table 11.21.

Table 11.20: Annual Mean PM_{10} Concentrations – Automatic Monitoring Stations (µg/m³)

Site Name	Type	2015	2016	2017	2018	2019
Rochester Stoke	Rural	14.6	15.8	15.8	17.4	15.0

Source: Medway Council Annual Status Report 2020.

Table 11.21: Number of Exceedances of the PM_{10} 24-Hour Mean Objective – Automatic Monitoring Stations

Site Name	2015	2016	2017	2018	2019
Rochester Stoke	2	4	4	0	10

Source: Medway Council Annual Status Report 2019

11.102 Annual mean concentrations of PM_{10} are well within the long-term air quality objective of 40µg/m³ at the automatic monitoring site. Similarly, the number of exceedances of the 24 hour mean level of 50µg/m³ has remained below the 35 allowable within the objective.

11.103 Further information on annual mean PM_{10} background concentrations has been obtained from Defra UK background pollution maps. The average background concentration across the Site and surrounding area in 2019 was 14.8µg/m³. This shows a good correlation with the concentrations measured at the Rochester Stoke monitoring site.

11.104 The road network included in the roads model cover a large area and there is much variation in the background concentration across the study area. Background concentrations obtained from the Defra background maps for each grid square that has been used in the modelling

are illustrated in Table 11.22 below.

Table 11.22: Estimated Annual Mean Background Concentrations from Defra Maps (µg/m³)

Grid Square	Relevant Receptor	PM_{10}
580500, 172500	R1, R3, R14	15.2
579500, 172500	R2, R4	15.7
580500, 173500	R5, R6, R7,	16.0
581500, 174500	R8, R9, R10,	15.8
582500, 174500	R11,	14.2
578500, 172500	R12	15.8
581500, 172500	R13	13.9
581500, 173500	R15, R16	14.3
578500, 173500	R17	16.1
577500, 173500	R18	15.3
576500, 172500	R19, R20,	16.4
575500, 171500	R21, R22, R23	16.6
574500, 171500	R24, R25, R26	17.0
573500, 170500	R27	17.2
571500, 170500	R28	16.9
570500, 171500	R29	15.7
572500, 170500	R30, R31,	16.9
570500, 169500	R32	17.1
571500, 168500	R33	18.1
575500, 171500	R34	16.6
574500, 171500	R35	17.0
574500, 170500	R36, R39, R41, R42, R43	17.1
573500, 170500	R37, R38	17.2
575500, 170500	R40	15.7
577500, 169500	R44	17.1
578500, 169500	R45	15.8
578500, 168500	R46	18.1
579500, 168500	R47	16.4

11.105 Concentrations of $PM_{2.5}$ measured at the Rochester Stoke monitoring site are presented in Table 11.23 below.

Table 11.23: Annual Mean $PM_{2.5}$ Concentrations – Automatic Monitoring Stations (µg/m³)

Site Name	Type	2015	2016	2017	2018	2019
Rochester Stoke	Rural	8.9	11.3	9.7	10.1	10.9

Source: Medway Council Annual Status Report 2020

11.106 Further information on annual mean $PM_{2.5}$ background concentrations has been obtained from Defra UK background pollution maps. The average background concentration across the Site and surrounding area in 2019 was 9.8µg/m³. This shows a good correlation with the concentrations measured at the Rochester Stoke monitoring site.

11.107 The road network included in the roads model cover a large area and there is much variation in the background concentration across the study area. Background concentrations obtained from the Defra background maps for each grid square that has been used in the modelling are illustrated in Table 11.24 below.

Table 11.24: Estimated Annual Mean Background Concentrations from Defra Maps (µg/m^3)

Grid Square	Relevant Receptor	$PM_{2.5}$
580500, 172500	R1, R3, R14	10.2
579500, 172500	R2, R4	10.1
580500, 173500	R5, R6, R7,	10.4
581500, 174500	R8, R9, R10,	9.8
582500, 174500	R11,	9.4
578500, 172500	R12	10.6
581500, 172500	R13	10.6
581500, 173500	R15, R16	9.5
578500, 173500	R17	10.3
577500, 173500	R18	10.1
576500, 172500	R19, R20,	10.5
575500, 171500	R21, R22, R23	11.0
574500, 171500	R24, R25, R26	11.2
573500, 170500	R27	11.8
571500, 170500	R28	11.1
570500, 171500	R29	10.4
572500, 170500	R30, R31,	11.1
570500, 169500	R32	11.3
571500, 168500	R33	12.2
575500, 171500	R34	11.0
574500, 171500	R35	11.2
574500, 170500	R36, R39, R41, R42, R43	11.7
573500, 170500	R37, R38	11.8
575500, 170500	R40	10.8
577500, 169500	R44	11.9
578500, 169500	R45	11.0
578500, 168500	R46	13.0
579500, 168500	R47	11.4

Sulphur Dioxide

11.108 Automatic monitoring of background SO_2 concentrations is undertaken by MC at Rochester Stoke monitoring site. There have been no recorded exceedances of the 15-minute, 1-hour or 24-hour mean air quality objectives in recent years.

11.109 The measured concentration in 2019 at the Rochester Stoke monitoring site is 1.5µg/m^3.

Carbon Monoxide

11.110 Monitoring of CO concentrations is not currently undertaken by the Council, therefore annual

mean CO background concentrations for 2018 have been obtained from Defra UK background maps. The CO mapping is based on 2001 monitoring data and factors are available to project the concentrations to future years.

11.111 The 2019 annual mean background CO concentration for the area surrounding the Site is around 134μg/m^3.

Total Organic Compounds (TOCs) (as Benzene)

11.112 Monitoring of benzene concentrations is not currently undertaken by the Council. Therefore, annual mean benzene background concentrations for 2019 have been obtained from DEFRA UK background maps. The benzene mapping is based on 2001 monitoring data and factors are available to project the concentrations to future years.

11.113 The 2019 annual mean background benzene concentration for the area surrounding the Site is around 0.4 μg/m^3.

Hydrogen Chloride

11.114 Ambient monitoring of Hydrogen Chloride (HCl) is carried out as part of the Defra Acid Gases and Aerosols Network (AGANET) at a number of locations around the UK. The nearest monitoring site to the Site is Detling, which is located approximately 15km to the south of the Site. At this location, the average HCl concentration measured over the five year period from 2011 to 2015 was 0.4μg/m^3. The UK average over the same period was 0.27μg/m^3. For the purposes of this assessment, a concentration of 0.4μg/m^3 has been used as the background HCl concentration.

Hydrogen Fluoride

11.115 Monitoring of ambient levels of hydrogen fluoride is not currently carried out in the UK, however the Expert Panel on Air Quality Standards (EPAQS) report on halogen and hydrogen halides in ambient air[xviii] cites a modelling study which suggests that the typical natural background HF concentration is 0.5μg/m^3, with an elevated background of 3μg/m^3 where there are local anthropogenic emission sources.

11.116 Since the Site is located in a predominantly industrial area, a background HF concentration of 3μg/m^3 is applied at sensitive human health and habitat receptors in the vicinity of the Site.

Trace Metals

11.117 Defra undertakes monitoring of trace elements at a number of locations in the UK as part of the UK Heavy Metals Network.

11.118 Average concentrations measured between 2015 and 2019 at the nearest monitoring site which is Chadwell St Mary, an urban background site, are summarised in Table 11.25. Mercury is not currently measured at the Chadwell St Mary, average concentrations were therefore taken from the urban background site in London Westminster.

Table 11.25: Metals Background Concentrations (ng/m^3)

Pollutant	UK average (ng/m^3)	Environmental Assessment Level ('EAL') (µg/m^3)
Cadmium (Cd)	0.25 (0.00025 µg/m^3)	0.005
Thalium (Tl)	Not measured	1
Mercury (Hg)	2.9 (0.00291 µg/m^3)	0.25
Antimony (Sb)	Not measured	5
Arsenic (As)	0.98 (0.00098 µg/m^3)	0.006 / 0.003
Lead (Pb)	12.0 (0.012 µg/m^3)	0.25 / 0.50
Chromium (Cr)	2.57 (0.00257 µg/m^3)	5 (CrIII) 0.0002 (CrVI)
Cobalt (Co)	0.11 (0.00011 µg/m^3)	1
Copper (Cu)	10.5 (0.0105 µg/m^3)	10
Manganese (Mn)	5.36 (0.00536 µg/m^3)	0.15
Nickel (Ni)	1.02 (0.00102 µg/m^3)	0.02
Vanadium	1.15 (0.00115 µg/m^3)	5

11.119 With the exception of Cr(VI), all the measured concentrations are well below their respective EALs. Guidance issued by the EA for the assessment of Group 3 metals states that for screening purposes, it should be assumed that Cr(VI) comprises 20% of the total background chromium. On this basis, the UK average Cr(VI) concentration still substantially exceeds the EAL.

Dioxins and Furans

11.120 Monitoring of polychlorinated dibenzo-p-dioxins (PCDD/Fs) is currently carried out by Defra at six locations in the UK (Hazelrigg, High Muffles, London, Manchester, Auchencorth Moss and Weybourne) as part of the Toxic Organic Micropollutants (TOMPs) Network.

11.121 To provide an indication of the range of PCDD/F concentrations that occur in the UK, a summary of the annual mean concentrations measured between 2014 and 2016, which are the latest available data from Defra website is presented in Table 11.26.

Table 11.26: UK PCDD/Fs Concentrations (fg.TEQ/m^3)

Monitoring Site	Type	2014	2015	2016
London	Urban background	2.9	4.4	18.7
Manchester	Urban background	17.0	6.0	8.7
Auchencorth Moss	Rural background	0.01	-	0.2
High Muffles	Rural background	1.4	1.1	4.4
Hazelrigg	Rural background	2.6	5.3	3.1
Weybourne	Rural background	1.6	1.4	20.4

11.122 In general, the concentration of dioxins and furans at rural locations is considerably lower than at urban locations.

11.123 The average concentration measured at the two urban background monitoring sites from 2014 to 2016 is 9.6 fg/m^3 and is assumed to be reasonably representative of the background dioxin and furan concentrations at the Site and nearby sensitive receptors.

Polycyclic Aromatic Hydrocarbons (as benzo[a]pyrene)

11.124 Monitoring of benzo(a)pyrene (BaP) is currently carried out by Defra at a number of locations in the UK as part of the PAH monitoring and analysis network.

11.125 The average urban and rural background concentrations measured in the UK between 2015 and 2019 were 0.26 ng/m^3 and 0.082 ng/m^3, respectively.

11.126 The average urban background concentration is assumed to provide a reasonable estimate of the background concentration in the vicinity of the Site.

Polychlorinated Biphenyls

11.127 Monitoring of PCBs is currently carried out by Defra at six locations in the UK as part of the TOMPs Network. The average PCB concentration measured at the urban background monitoring sites from 2016 to 2018 is 0.000089µg/m^3 and is assumed to be reasonably representative of the baseline PCB concentration at the Site and nearby sensitive receptors.

Ammonia (NH_3)

11.128 Monitoring of NH_3 is currently carried out by Defra in the UK as part of the National Ammonia Network. The nearest monitoring site to the Site is Detling, which is located approximately 15km to the south of the Site. At this location, the average NH_3 concentration measured over the five year period from 2015 to 2019 was 1.0µg/m^3 and is assumed to be reasonably

representative of the baseline NH_3 concentration at the Site and nearby sensitive receptors.

Likely Significant Effects

Construction Phase

11.129 The Site is currently vacant and predominantly comprises previously developed land, the majority of which was formerly occupied by Kingsnorth Power Station. The Site has been decommissioned and demolition works have been mostly completed.

11.130 Very few (less than 10) residential receptors or other highly sensitive human receptors are located within 350m of the Site. There are also a number of commercial buildings located within 350m of the Site boundary, including buildings within the Kingsnorth Industrial Estate and at Damhead Creek Power Station. These are classed as being of medium sensitivity to impacts from dust and particulate matter. There are no residential properties located within 20m of the Site boundary but one commercial building is within 20m of the boundary. To ensure a worst-case assessment the sensitivity of the area to dust emissions is considered to be medium. The background PM_{10} concentration for the area of the Site is likely to be less than 24µg/m^3, therefore the sensitivity of the area to human health impacts from particulate matter is considered to be low.

11.131 The Site is bordered to the west, south and partially to the east by the Medway Estuary & Marshes SPA, SSSI and Ramsar site. The sensitivity of the area to impacts on ecology is considered to be medium.

11.132 Construction traffic will access the Site via the site entrance on Eshcol Road. The route will likely include Stoke Road and Ropers Lane leading to the A228. The Site is large, therefore receptors within 500m of the roadside along this route from the site access will determine the sensitivity of the area to effects from track-out. There are no residential or other highly sensitive receptors along this section of road. The Kingsnorth Industrial Estate is located along this section of road, however none of the buildings are within 50m of the roadside of Eshcol Road. There are no sensitive ecological sites within 50m of the roadside of these roads. Therefore, the sensitivity of the area to effects from track-out is negligible.

11.133 The precise behaviour of the dust, its residence time in the atmosphere, and the distance it may travel before being deposited will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

11.134 A wind rose from Gravesend is provided in Figure 11.2, which shows that the prevailing wind is from the southwest. Therefore, receptors to the northeast of the Site are the most likely to experience dust impacts from the Development. The area immediately to the northeast of the Site is the Kingnorth Industrial Estate, Damhead Creek Power Station and parts of Medway Estuary and Marshes SPA, SSSI and Ramsar site.

Dust Emission Magnitude

11.135 Following the closure of the Kingsnorth Power Station in 2013, the Site has been de-commissioned and the buildings and structures have been demolished. Demolition has therefore not been included in the assessment.

11.136 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling of the Site and landscaping. The area of the Site is approximately 111ha. During earthworks, there is likely to be more than 10 heavy earthmoving vehicles on the Site at any given time and materials are likely to be stored in bunds greater than 8m in height. The magnitude of the dust emission for the earthworks phase is therefore large.

11.137 Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build. The completed Development will have a volume of greater than 100,000m^3 and the main construction material would involve the use of concrete, known to be a dusty material. Based on the overall size of the Development, the dust emission magnitude is large.

11.138 Factors influencing the degree of trackout and associated magnitude of effect include vehicle size, vehicle speed, vehicle numbers, geology and duration. Construction traffic will access the Site via the Eshcol Road, Stoke Road and Ropers Lane leading to the A228. The number of HDV movements (leaving the Site) per day is estimated to be 100. Therefore, the dust emission magnitude due to trackout is large.

Dust Risk Effects

11.139 A summary of the potential risk of dust impacts, based on the low overall sensitivity of the area to ecological effects, is presented in Table 11.27.

Table 11.27: Risk of Dust Impacts Prior to Mitigation

Source	Impact Magnitude	Risk of Dust	Risk of Human Health Effects (PM_{10})	Ecological Risk
Earthworks	Large	Medium	Low	Medium
Construction	Large	Medium	Low	Medium
Trackout	Large	NA	NA	NA

Construction Traffic

Predicted NO_2 Concentrations

11.140 Annual mean NO_2 concentrations predicted at the identified receptor locations are presented in Table 11.28 below. Only the receptors likely to be affected by construction traffic are presented.

Table 11.28: Predicted Annual Mean NO_2 Concentrations (µg/m^3)

Receptor	2028		Concentration Change due to Development(as a % of the AQAL)	Significance of Impact
	Without Development	With Development		
R4	14.7	15.4	1.8	Medium
R5	14.8	15.8	2.5	Medium
R12	14.2	14.5	0.6	Low/Imperceptible
R17	16.2	16.9	1.7	Medium
R18	16.1	16.7	1.3	Medium
R19	17.8	18.4	1.7	Medium
R20	20.4	21.8	3.4	Medium
R21	25.0	26.9	5.0	Medium
R22	25.7	27.6	4.9	Medium
R23	18.7	19.0	0.8	Low/Imperceptible
R24	20.1	20.6	1.4	Medium
R25	20.4	21.0	1.6	Medium
R26	19.6	20.1	1.2	Medium
R27	20.5	21.0	1.3	Medium
R28	20.9	21.1	0.4	Low/Imperceptible
R29	18.3	18.4	0.3	Low/Imperceptible
R30	18.1	18.3	0.5	Low/Imperceptible
R31	17.9	18.1	0.5	Low/Imperceptible
R32	30.3	30.6	0.8	Low/Imperceptible
R33	26.2	26.4	0.6	Low/Imperceptible
R34	21.0	21.4	1.0	Medium
R35	19.3	19.5	0.5	Low/Imperceptible
R36	19.5	19.7	0.6	Low/Imperceptible
R37	21.3	21.5	0.6	Low/Imperceptible
R38	23.4	23.5	0.4	Low/Imperceptible
R39	20.1	20.2	0.3	Low/Imperceptible
R40	19.4	19.6	0.6	
R41	20.2	20.4	0.4	Low/Imperceptible
R42	22.3	22.5	0.5	Low/Imperceptible
R43	20.5	20.7	0.5	Low/Imperceptible
R44	25.7	25.9	0.5	Low/Imperceptible
R45	19.8	19.9	0.4	Low/Imperceptible
R46	20.4	20.6	0.4	Low/Imperceptible

Receptor	2028		Concentration Change due to Development(as a % of the AQAL)	Significance of Impact
	Without Development	With Development		
R47	17.0	17.1	0.2	Low/Imperceptible
*With Development – includes contribution from construction traffic and Development Traffic assuming 90% of the Development will be operational plus contribution from EfW plant. for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore are not presented.				

11.141 The results of the modelling demonstrate that the Air Quality Assessment Level (AQAL) which is the AQS objective level for annual mean NO_2 concentrations (40µg/m^3) will be met at all of the receptor locations included in the assessment with regards to the road traffic assessment.

11.142 The combined impact of the construction traffic and operational Development is predicted to increase the annual mean NO_2 concentrations at the sensitive receptors. In accordance with the significance criteria provided in the Medway Council Air Quality Planning Guidance, the combined impact of the construction traffic and the operational Development on annual mean NO_2 concentrations is medium at receptors along the key route to the Site.

11.143 In accordance with the EPUK & IAQM criteria, the impact is classed as negligible.

11.144 As discussed previously, LAQM.TG(16) does not include a conversion between annual and hourly mean NO_2 concentrations. However, research has determined that where the annual mean NO_2 concentration is below 60µg/m^3, it is unlikely that the hourly mean NO_2 objective will be breached. As the predicted annual mean NO_2 concentrations are well below 60µg/m^3, it is extremely unlikely that the impact of the construction traffic will lead to any breaches of the hourly mean AQS objective.

Predicted PM_{10} Concentrations

11.145 Annual mean PM_{10} concentrations predicted at the identified receptor locations are presented in Table 11.29 below. Only the receptors likely to be affected by construction traffic are presented.

Table 11.29: Predicted Annual Mean PM_{10} Concentrations (µg/m^3)

Receptor	2028		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development		
R4	16.3	17.0	0.8	Low/Imperceptible
R5	16.6	17.7	1.4	Medium
R12	16.0	16.1	0.2	Low/Imperceptible
R17	16.8	17.6	1.0	Low/Imperceptible

Receptor	2028		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development		
R18	15.9	16.5	0.7	Low/Imperceptible
R19	17.5	18.2	0.9	Low/Imperceptible
R20	18.9	20.4	1.9	Medium
R21	20.4	22.8	3.0	Medium
R22	20.0	22.1	2.6	Medium
R23	17.2	17.4	0.4	Low/Imperceptible
R24	17.9	18.6	0.9	Low/Imperceptible
R25	18.0	18.8	1.0	Low/Imperceptible
R26	17.8	18.3	0.7	Low/Imperceptible
R27	18.3	19.0	0.8	Low/Imperceptible
R28	17.8	17.9	0.2	Low/Imperceptible
R29	17.1	17.1	0.1	Low/Imperceptible
R30	17.3	17.4	0.2	Low/Imperceptible
R31	17.2	17.3	0.1	Low/Imperceptible
R32	18.9	19.2	0.4	Low/Imperceptible
R33	19.4	19.7	0.3	Low/Imperceptible
R34	18.0	18.4	0.5	Low/Imperceptible
R35	17.6	17.8	0.2	Low/Imperceptible
R36	17.9	18.1	0.2	Low/Imperceptible
R37	18.8	19.0	0.3	Low/Imperceptible
R38	19.7	19.8	0.1	Low/Imperceptible
R39	18.3	18.3	0.1	Low/Imperceptible
R40	16.9	17.0	0.2	Low/Imperceptible
R41	18.3	18.4	0.1	Low/Imperceptible
R42	19.2	19.3	0.1	Low/Imperceptible
R43	18.3	18.4	0.1	Low/Imperceptible
R44	19.5	19.7	0.2	Low/Imperceptible
R45	17.3	17.4	0.1	Low/Imperceptible
R46	20.2	20.3	0.1	Low/Imperceptible
R47	17.2	17.2	0.1	Low/Imperceptible
*With Development – includes contribution from construction traffic and Development Traffic assuming 90% of the Development will be operational plus contribution from EfW plant. for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore are not presented.				

11.146 The results of the modelling demonstrate that the AQAL which is the AQS objective level for annual mean PM_{10} concentrations (40µg/m^3) will be met at all of the receptor locations included in the assessment with regards to the road traffic assessment.

11.147 The combined impact of the construction traffic and operational Development is predicted to increase the annual mean PM_{10} concentrations the sensitive receptors. In accordance with the significance criteria provided in the Medway Council Air Quality Planning Guidance, the combined impact of the construction traffic and operational Development on annual mean PM_{10} concentrations is medium at receptors along the key route to the Site.

11.148 In accordance with the EPUK & IAQM criteria, the impact is classed as negligible.

11.149 LAQM.TG(16) provides a relationship between predicted annual mean concentrations and the likely number of exceedances of the short-term (24 hour mean) PM_{10} objective of 50µg/m^3 at

(N), where:

$N = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$.

11.150 The objective allows 35 exceedances per year, which is equivalent to an annual mean of 32µg/m^3.

11.151 Based on the above approach, the maximum number of days where PM_{10} concentrations are predicted to exceed 50µg/m^3 is 3 with or without the construction traffic, which is well below the AQS objective level. The impact of the construction traffic was predicted to result in a change of less than one day. The impact on 24 hour mean PM_{10} concentrations at receptors affected by road traffic is therefore also considered to be negligible.

Predicted $PM_{2.5}$ Concentrations

11.152 Annual mean $PM_{2.5}$ concentrations predicted at the identified receptor locations are presented in Table 11.30 below. Only the receptors likely to be affected by construction traffic are presented.

Table 11.30: Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)

Receptor	2028		Concentration Change due to Development(as a % of the AQAL)	Significance of Impact
	Without Development	With Development		
R4	10.5	10.7	0.7	Low/Imperceptible
R5	10.7	11.0	1.2	Medium
R12	10.7	10.7	0.2	Low/Imperceptible
R17	10.7	10.9	0.9	Low/Imperceptible
R18	10.5	10.6	0.6	Low/Imperceptible
R19	11.1	11.3	0.8	Low/Imperceptible
R20	11.9	12.3	1.7	Medium
R21	13.1	13.7	2.6	Medium
R22	12.9	13.5	2.4	Medium
R23	11.3	11.3	0.3	Low/Imperceptible
R24	11.8	12.0	0.8	Low/Imperceptible
R25	11.8	12.0	0.9	Low/Imperceptible
R26	11.7	11.8	0.6	Low/Imperceptible
R27	12.4	12.6	0.8	Low/Imperceptible
R28	11.6	11.6	0.2	Low/Imperceptible
R29	11.2	11.3	0.1	Low/Imperceptible
R30	11.3	11.4	0.2	Low/Imperceptible
R31	11.3	11.3	0.1	Low/Imperceptible
R32	12.4	12.5	0.4	Low/Imperceptible
R33	13.0	13.0	0.3	Low/Imperceptible
R34	11.7	11.9	0.5	Low/Imperceptible
R35	11.6	11.6	0.2	Low/Imperceptible
R36	12.2	12.3	0.2	Low/Imperceptible
R37	12.6	12.7	0.3	Low/Imperceptible
R38	13.2	13.2	0.1	Low/Imperceptible

Receptor	2028		Concentration Change due to Development(as a % of the AQAL)	Significance of Impact
	Without Development	With Development		
R39	12.4	12.4	0.1	Low/Imperceptible
R40	11.5	11.5	0.2	Low/Imperceptible
R41	12.4	12.4	0.1	Low/Imperceptible
R42	12.9	13.0	0.1	Low/Imperceptible
R43	12.5	12.5	0.1	Low/Imperceptible
R44	13.2	13.3	0.2	Low/Imperceptible
R45	11.9	11.9	0.1	Low/Imperceptible
R46	14.2	14.2	0.1	Low/Imperceptible
R47	11.8	11.8	0.1	Low/Imperceptible
*With Development – includes contribution from construction traffic and Development Traffic assuming 90% of the Development will be operational plus contribution from EfW plant. for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore are not presented.				

11.153 The results of the modelling demonstrate that the AQAL which is the AQS objective level for annual mean $PM_{2.5}$ concentrations (25µg/m^3) will be met at all of the receptor locations included in the assessment with regards to the road traffic assessment.

11.154 The combined impact of the construction traffic and operational Development is predicted to increase the annual mean $PM_{2.5}$ concentrations at the sensitive receptors. In accordance with the significance criteria provided in the Medway Council Air Quality Planning Guidance, the impact of the construction traffic on annual mean $PM_{2.5}$ concentrations is Medium along the key route to Site.

11.155 In accordance with the EPUK & IAQM criteria, the impact is classed as negligible.

Operational Phase

Without Highway Improvement Scheme

Predicted NO_2 Concentrations

11.156 Annual mean NO_2 concentrations, predicted at the identified receptor locations are presented in Table 11.31 below. NO_2 arises from both road traffic emissions and the process emissions from the possible EfW plant (as a worst case of the parameters of the outline application), the results below are therefore combined emissions from the two models.

Table 11.31: Predicted Annual Mean NO_2 Concentrations ($\mu g/m^3$)

Receptor	2037		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
R1	-	13.6	0.7	Low/Imperceptible
R2	-	13.4	0.9	Low/Imperceptible
R3	-	13.5	0.5	Low/Imperceptible
R4	13.8	14.4	1.6	Medium
R5	14.2	15.0	2.2	Medium
R6	-	13.5	0.4	Low/Imperceptible
R7	-	13.6	0.5	Low/Imperceptible
R8	-	12.5	0.6	Low/Imperceptible
R9	-	12.7	1.0	Low/Imperceptible
R10	-	12.5	0.6	Low/Imperceptible
R11	-	12.3	0.7	Low/Imperceptible
R12	14.1	14.3	0.6	Low/Imperceptible
R13	-	12.6	0.4	NA
R14	-	13.5	0.3	NA
R15	-	12.8	1.0	NA
R16	-	12.9	1.3	NA
R17	15.4	16.0	1.5	Medium
R18	15.5	15.9	1.1	Medium
R19	16.7	17.3	1.5	Medium
R20	18.3	19.6	3.1	Medium
R21	22.0	23.8	4.5	Medium
R22	22.9	24.7	4.7	Medium
R23	18.1	18.4	0.7	Low/Imperceptible
R24	19.4	19.9	1.3	Medium
R25	19.6	20.1	1.5	Medium
R26	19.1	19.5	1.1	Medium
R27	19.5	20.0	1.3	Medium
R28	20.3	20.4	0.4	Low/Imperceptible
R29	17.4	17.5	0.3	Low/Imperceptible
R30	17.8	18.0	0.5	Low/Imperceptible
R31	17.7	17.8	0.4	Low/Imperceptible
R32	28.2	28.6	0.8	Low/Imperceptible
R33	24.6	24.9	0.6	Low/Imperceptible
R34	19.4	19.8	1.0	Medium
R35	18.4	18.6	0.5	Low/Imperceptible
R36	18.5	18.7	0.6	Low/Imperceptible
R37	20.3	20.6	0.6	Low/Imperceptible
R38	22.0	22.1	0.3	Low/Imperceptible
R39	19.3	19.4	0.3	Low/Imperceptible
R41	18.3	18.5	0.6	Low/Imperceptible
R42	19.0	19.1	0.4	Low/Imperceptible
R43	20.2	20.4	0.4	Low/Imperceptible
R44	19.3	19.5	0.5	Low/Imperceptible
R45	24.8	24.9	0.5	Low/Imperceptible
R46	19.2	19.3	0.4	Low/Imperceptible
R47	20.0	20.1	0.3	Low/Imperceptible

*With Development – includes contribution from traffic and possible energy generating plant for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore do not include a contribution from road traffic either existing or proposed. Without Development concentrations for Receptors R1 to R3, R6 and R16 can be considered to be the background concentrations only and therefore not presented in the table.
Receptors R13 to R16 are short term receptors, therefore the annual mean standards and significance criteria are not applicable at these locations.

11.157 The results of the modelling demonstrate that in the assessment year of 2037, the AQAL which is the AQS objective level for annual mean NO_2 concentrations (40µg/m^3) will be met at all of the receptor locations included within the assessment.

11.158 The operation of the Development is predicted to increase annual mean NO_2 concentrations at the existing receptors included in the assessment. The greatest increase in NO_2 concentrations (1.9µg/m^3 which is 4.7% of the relevant AQAL) is predicted at receptors close to the A228 through Chattenden, which is along the key route for traffic accessing the Site from the M2 motorway. Dwellings are located close to the roadside along this section of road which has been designated as an AQMA. The impact arising from the emissions from the possible EfW plant is smaller. The greatest increase in annual mean NO_2 concentrations as a result of emissions from the EfW plant is a concentration of 0.24µg/m^3 at receptor R1 Burnt House Farm. In accordance with the Medway Planning Guidance Air Quality Significance criteria set out in Table 11.12, the impact is classed as medium at locations along the key route to the Site. It should be noted that in accordance with the EPUK & IAQM criteria set out in Table 11.14, the impact of the Development on annual mean NO_2 concentrations is classed as negligible.

11.159 As discussed previously, LAQM.TG(16) does not include a conversion between annual and hourly mean NO_2. However, research has determined that where the annual mean NO_2 concentration is below 60µg/m_3, it is unlikely that the hourly mean NO_2 objective will be breached. Whilst it is acknowledged that this relationship was derived for traffic related sources, as the majority of the emissions at the sensitive receptors in the vicinity of the Site are traffic related, this relationship has been used as an indication of the likelihood of exceedances of the hourly mean NO_2 concentration. As the predicted annual mean NO_2 concentrations are well below 60µg/m^3 it is extremely unlikely that the operation of the Development will lead to any breaches of the hourly mean AQS objective level either.

11.160 The predicted hourly mean NO_2 concentrations arising from the possible EfW plant onsite at each of the sensitive receptors included in the assessment are presented in Table 11.32 below. The hourly mean AQS objective level is a concentration of 200µg/m^3, which is not to be breached more than 18 times a year. Concentrations are presented as the 99.79th percentile of hourly mean values for direct comparison with the 200µg/m^3 level.

Table 11.32: Predicted Hourly Mean NO_2 Concentrations (µg/m^3)

Receptor	Process Contribution from Energy Generating Plant	Process Contribution from Energy Generating Plant (as a % of the objective)	Significance of Impact
R1	13.4	6.7	Insignificant

Receptor	Process Contribution from Energy Generating Plant	Process Contribution from Energy Generating Plant (as a % of the objective)	Significance of Impact
R2	12.4	6.2	Insignificant
R3	13.5	6.8	Insignificant
R4	10.2	5.1	Insignificant
R5	11.4	5.7	Insignificant
R6	9.5	4.7	Insignificant
R7	10.2	5.1	Insignificant
R8	9.1	4.5	Insignificant
R9	10.4	5.2	Insignificant
R10	7.7	3.8	Insignificant
R11	6.3	3.1	Insignificant
R12	9.4	4.7	Insignificant
R13	11.7	5.8	Insignificant
R14	10.8	5.4	Insignificant
R15	13.9	6.9	Insignificant
R16	12.1	6.1	Insignificant

11.161 The Medway Air Quality Planning Guidance does not include significance criteria for short term concentrations.

11.162 The guidance provided by the EPUK & IAQM suggest that for short-term (hourly) emissions, the impact of emissions from an elevated point source can be assessed to be insignificant if the process contribution is less than 10% of the relevant AQS objective level. As illustrated in Table 11.32 above, the process contribution at all of the selected sensitive receptors is less than 10% of the objective level and therefore the impact is classed as insignificant.

11.163 It should be noted that a worst-case approach has been taken with regards to the emission factors used to assess short term impacts.

11.164 The maximum predicted hourly mean NO_2 concentration within the Development is 41.3µg/m^3 (as the 99.79th percentile) which is 20.7% of the relevant AQS objective level. The impact with regards to exposure is therefore also insignificant.

Predicted PM_{10} Concentrations

11.165 Predicted annual mean PM_{10} concentrations at the selected receptor locations are presented below in Table 11.33. PM_{10} arises from both road traffic emissions and the process emissions from the possible EfW plant, the results below are therefore combined emissions from the two models.

Table 11.33: Predicted Annual Mean PM_{10} Concentrations (µg/m³)

Receptor	2037		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
R1	-	15.3	0.1	Low/Imperceptible
R2	-	15.7	0.1	Low/Imperceptible
R3	-	15.3	0.1	Low/Imperceptible
R4	16.1	16.4	0.8	Low/Imperceptible
R5	16.4	17.0	1.4	Medium
R6	-	16.1	0.1	Low/Imperceptible
R7	-	16.1	0.1	Low/Imperceptible
R8	-	15.9	0.1	Low/Imperceptible
R9	-	15.9	0.1	Low/Imperceptible
R10	-	15.8	0.1	Low/Imperceptible
R11	-	14.2	0.1	Low/Imperceptible
R12	15.9	16.0	0.2	Low/Imperceptible
R13	-	13.9	0.1	NA
R14	-	15.2	0.1	NA
R15	-	14.3	0.1	NA
R16	-	14.3	0.1	NA
R17	16.6	17.0	1.0	Low/Imperceptible
R18	15.8	16.0	0.7	Low/Imperceptible
R19	17.2	17.6	0.9	Low/Imperceptible
R20	18.2	19.0	2.0	Medium
R21	19.5	20.7	3.1	Medium
R22	19.3	20.5	2.8	Medium
R23	17.0	17.2	0.4	Low/Imperceptible
R24	17.9	18.2	0.9	Low/Imperceptible
R25	17.9	18.3	1.0	Medium
R26	17.7	18.0	0.7	Low/Imperceptible
R27	18.1	18.4	0.9	Low/Imperceptible
R28	17.6	17.7	0.2	Low/Imperceptible
R29	16.9	16.9	0.1	Low/Imperceptible
R30	17.3	17.3	0.2	Low/Imperceptible
R31	17.2	17.3	0.2	Low/Imperceptible
R32	18.7	18.9	0.4	Low/Imperceptible
R33	19.3	19.4	0.3	Low/Imperceptible
R34	17.6	17.8	0.5	Low/Imperceptible
R35	17.4	17.5	0.2	Low/Imperceptible
R36	17.6	17.7	0.2	Low/Imperceptible
R37	18.6	18.8	0.3	Low/Imperceptible
R38	19.5	19.5	0.1	Low/Imperceptible
R39	18.1	18.1	0.1	Low/Imperceptible
R41	16.7	16.8	0.2	Low/Imperceptible
R42	17.9	18.0	0.1	Low/Imperceptible
R43	18.6	18.6	0.1	Low/Imperceptible
R44	18.1	18.1	0.1	Low/Imperceptible
R45	19.5	19.6	0.2	Low/Imperceptible
R46	17.3	17.4	0.1	Low/Imperceptible
R47	20.3	20.4	0.1	Low/Imperceptible

*With Development – includes contribution from traffic and possible energy generating plant for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore do not include a contribution from road traffic either existing or proposed. Without Development concentrations for Receptors R1 to R3, R6 and R16 can be considered to be the background concentrations only and therefore not presented in the table.
Receptors R13 to R16 are short term receptors, therefore the annual mean standards and significance criteria are not applicable at these locations.

11.166 The results of the modelling demonstrate that predicted annual mean PM_{10} concentrations are well below (less than 75% of) the AQAL which is the AQS objective level of 40 μg/m^3 at all the selected receptors both with and without the Development operational.

11.167 The operation of the Development is predicted to slightly increase annual mean PM_{10} concentrations at the receptors included in the assessment. The greatest change in PM_{10} concentrations is predicted at receptors close to the roads where the traffic flows are impacted by the Development, in particular at properties close to the roadside along the A226 through Chattenden, which is designated as an AQMA. In accordance with the criteria outlined in the Medway Planning Guidance set out in Table 11.12, the impact is classified as Medium at five roadside receptors and low/imperceptible at the remaining receptors. In accordance with the EPUK & IAQM criteria set out in Table 11.14, the impact of the Development on annual mean PM_{10} concentrations is classed as negligible at all receptor locations.

11.168 For road traffic emissions, LAQM.TG(16) provides a relationship between predicted annual mean concentrations and the likely number of exceedances of the short-term (24-hour mean) PM_{10} objective of 50 μg/m^3 at (N), where:

$$N = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean}).$$

11.169 The objective allows 35 exceedances per year, which is equivalent to an annual mean of 32 μg/m^3.

11.170 Based on the above approach, at the receptors that are impacted by road traffic, the maximum number of days where PM_{10} concentrations are predicted to exceed 50μg/m^3 is 3 without the Development and 4 with the Development, which is well below the allowable no of exceedances (35 days) included in the AQS objective level. A change of less than two days is predicted as a result of the operation of the Development. The impact on 24-hour mean PM_{10} concentrations at the receptors affected by road traffic is therefore negligible.

11.171 Table 11.34 provides the 24 hour mean PM_{10} concentrations predicted as a result of the emissions from the EfW plant. The AQS objective level for 24 hour PM_{10} concentrations is 50μg/m^3, which is not to be exceeded more than 35 times per year. The results are presented as the 90.41st percentile in order to allow direct comparison with the 50μg/m^3 level.

Table 11.34: Predicted 24 Hour Mean PM_{10} Concentrations (from Energy Generating Plant) (µg/m^3)

Receptor	Process Contribution from Energy Generating Plant (as 90.41st percentile of 24 hour mean concentrations)	Process Contribution from Energy Generating Plant (as a % of the objective)
R1	0.06	0.12
R2	0.08	0.17
R3	0.03	0.07
R4	0.02	0.05
R5	0.02	0.03
R6	0.03	0.05
R7	0.04	0.07
R8	0.05	0.09
R9	0.06	0.13
R10	0.05	0.09
R11	0.05	0.09
R12	0.03	0.07
R13	0.04	0.07
R14	0.03	0.06
R15	0.07	0.13
R16	0.10	0.19

11.172 Neither the Medway Planning Guidance nor the EPUK & IAQM guidance provide a criterion for determining the significance of 24 hour mean concentrations. However, the total PEC is well below (less than 75% of) the relevant objective level of 50µg/m^3 and the PC is less than 1%. Therefore, the likely impact of the Development on 24-hour mean PM_{10} concentrations is considered to be negligible.

Predicted $PM_{2.5}$ Concentrations

11.173 Predicted annual mean $PM_{2.5}$ concentrations at the identified receptor locations are presented in Table 11.35 below. $PM_{2.5}$ arises from both road traffic emissions and the process emissions from the possible EfW plant, the results below are therefore combined emissions from the two models.

Table 11.35: Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m_3)

Receptor	2037		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
R1	-	10.2	0.1	Low/Imperceptible
R2	-	10.2	0.1	Low/Imperceptible
R3	-	10.2	0.1	Low/Imperceptible
R4	10.3	10.5	0.8	Low/Imperceptible
R5	10.6	10.9	1.3	Medium
R6	-	10.4	0.1	Low/Imperceptible

Receptor	2037		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
R7	-	10.4	0.1	Low/Imperceptible
R8	-	9.9	0.1	Low/Imperceptible
R9	-	9.9	0.1	Low/Imperceptible
R10	-	9.9	0.1	Low/Imperceptible
R11	-	9.4	0.1	Low/Imperceptible
R12	10.6	10.7	0.2	Low/Imperceptible
R13	-	10.6	0.1	NA
R14	-	10.2	0.1	NA
R15	-	9.6	0.1	NA
R16	-	9.6	0.1	NA
R17	10.6	10.8	0.9	Low/Imperceptible
R18	10.4	10.5	0.6	Low/Imperceptible
R19	11.0	11.2	0.8	Low/Imperceptible
R20	11.5	11.9	1.7	Medium
R21	12.5	13.2	2.7	Medium
R22	12.5	13.1	2.5	Medium
R23	11.2	11.3	0.3	Low/Imperceptible
R24	11.7	11.9	0.8	Low/Imperceptible
R25	11.8	12.0	0.9	Low/Imperceptible
R26	11.6	11.8	0.7	Low/Imperceptible
R27	12.3	12.5	0.8	Low/Imperceptible
R28	11.5	11.6	0.2	Low/Imperceptible
R29	11.1	11.2	0.1	Low/Imperceptible
R30	11.3	11.4	0.2	Low/Imperceptible
R31	11.3	11.3	0.1	Low/Imperceptible
R32	12.3	12.4	0.4	Low/Imperceptible
R33	12.9	13.0	0.3	Low/Imperceptible
R34	11.5	11.7	0.5	Low/Imperceptible
R35	11.5	11.5	0.2	Low/Imperceptible
R36	12.1	12.1	0.2	Low/Imperceptible
R37	12.6	12.7	0.3	Low/Imperceptible
R38	13.1	13.1	0.1	Low/Imperceptible
R39	12.3	12.3	0.1	Low/Imperceptible
R41	11.3	11.4	0.2	Low/Imperceptible
R42	12.2	12.2	0.1	Low/Imperceptible
R43	12.6	12.6	0.1	Low/Imperceptible
R44	12.3	12.3	0.1	Low/Imperceptible
R45	13.2	13.3	0.2	Low/Imperceptible
R46	11.9	11.9	0.1	Low/Imperceptible
R47	14.3	14.3	0.1	Low/Imperceptible

*With Development – includes contribution from traffic and possible energy generating plant for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore do not include a contribution from road traffic either existing or proposed. Without Development concentrations for Receptors R1 to R3, R6 and R16 can be considered to be the background concentrations only and therefore not presented in the table.
Receptors R13 to R16 are short term receptors, therefore the annual mean standards and significance criteria are not applicable at these locations.

11.174 The results of the modelling assessment demonstrate that predicted annual mean $PM_{2.5}$ concentrations are well below (less than 75%) the AQAL which is the AQS objective level of 25 µg/m^3 at the selected receptor locations both with and without the Development in operation.

11.175 The operation of the Development is predicted to slightly increase annual mean $PM_{2.5}$ concentrations at the receptors included in the assessment. The greatest change in $PM_{2.5}$ concentrations is predicted at receptors close to the roads where the traffic flows are impacted by the Development, in particular at properties close to the roadside along the A228 through Chattenden, which is designated as an AQMA. In accordance with the criteria outlined in the Medway Planning Guidance set out in Table 11.12, the impact is classified as Medium at four roadside receptors and low/imperceptible at the remaining receptors. In accordance with the EPUK & IAQM criteria set out in Table 11.14, the impact of the Development on annual mean $PM_{2.5}$ concentrations is classed as negligible at all receptor locations.

Predicted CO Concentrations

11.176 Predicted 8-hour mean and hourly mean CO process contributions at the identified receptor locations are presented in Table 11.36 below. CO is not produced in significant quantities from vehicle exhaust. The concentrations presented below are therefore only as a result of emissions from the possible EfW plant, therefore concentrations are only presented for the receptors selected for proximity to the Site rather than the affected road network.

Table 11.36: Predicted 8-Hour Mean CO Concentrations (µg/m³)

Receptor	Maximum 8-Hour Mean		Maximum 1-Hour Mean	
	PC	PC (% AQAL)	PC	PC (% AQAL)
R1	8.5	0.09	13.5	0.04
R2	7.7	0.08	12.8	0.04
R3	7.5	0.07	13.3	0.04
R4	6.2	0.06	12.4	0.04
R5	10.3	0.10	13.5	0.04
R6	6.6	0.07	14.3	0.05
R7	6.3	0.06	13.9	0.05
R8	5.6	0.06	12.3	0.04
R9	6.7	0.07	13.5	0.05
R10	4.4	0.04	11.6	0.04
R11	3.8	0.04	9.6	0.03
R12	6.5	0.07	12.9	0.04
R13	6.2	0.06	14.2	0.05
R14	5.5	0.05	15.3	0.05
R15	9.2	0.09	12.9	0.04
R16	7.3	0.07	13.5	0.04
AQS	**10,000**		**30,000**	
Background *	**268**		**268**	
Maximum PEC	**278.3**		**283.3**	
Maximum PEC (% AQS)	**2.78%**		**0.94%**	
*** Short term background concentrations are twice the long term background concentration i.e. 2 x 133µg/m³ = 268µg/m³**				

11.177 The results of the modelling assessment demonstrate that predicted 8-hour mean and 1-hour mean CO concentrations are well below the relevant AQALs of 10,000 µg/m^3 and 30,000µg/m^3 respectively at the selected receptor locations.

11.178 The Medway Air Quality Planning Guidance does not include significance criteria for short term concentrations. The guidance provided by the EPUK & IAQM suggest that for short-term emissions, the impact of emissions from a point source can be assessed to be insignificant if the process contribution is less than 10% of the relevant AQAL.

11.179 The process contribution at all of the selected sensitive receptors is less than 10% of the relevant AQALs and therefore the impact is insignificant.

11.180 The maximum predicted 8 hour mean and hourly mean CO concentrations within the Development are 280µg/m^3 and 286.6µg/m^3 which are less than 3% and 1% of the relevant AQS objective levels respectively. The impact with regards to exposure is therefore also insignificant.

Predicted Sulphur Dioxide (SO_2) Concentrations

11.181 Predicted SO_2 process contributions at the identified receptor locations are presented in Table 11.37 below. SO_2 is not produced from vehicle exhaust. The concentrations presented below are therefore only as a result of emissions from the possible EfW plant. The AQS objective levels for 24-hour, hourly and 15 min mean SO_2 concentrations include a number of allowable exceedances within a year. Concentrations are presented as the 99.2nd percentile, 99.7th percentile and 99.9th percentile to enable direct comparison with the assessment levels.

Table 11.37: Predicted SO_2 Concentrations (µg/m^3)

Receptor	99.2nd Percentile of 24-Hour Means		99.7th Percentile of 1-Hour Means		99.9th Percentile of 15-Minute Means	
	PC	PC (% AQAL)	PC	PC (% AQAL)	PC	PC (% AQAL)
R1	1.0	0.8	18.8	5.4	22.3	8.4
R2	1.2	1.0	17.5	5.0	20.9	7.9
R3	0.6	0.5	18.5	5.3	22.3	8.4
R4	0.4	0.4	13.7	3.9	16.8	6.3
R5	0.5	0.4	15.1	4.3	19.2	7.2
R6	0.5	0.4	13.1	3.7	16.1	6.1
R7	0.7	0.6	14.3	4.1	16.5	6.2
R8	0.7	0.6	12.8	3.7	15.5	5.8
R9	1.1	0.8	14.7	4.2	17.2	6.5
R10	0.6	0.5	10.8	3.1	13.2	5.0
R11	0.6	0.5	8.9	2.5	12.8	4.8

R12	0.5	0.4	12.9	3.7	19.0	7.1
R13	0.5	0.4	15.6	4.5	20.4	7.7
R14	0.5	0.4	14.4	4.1	18.0	6.8
R15	1.4	1.1	19.7	5.6	22.4	8.4
R16	1.6	1.3	17.2	4.9	20.0	7.5
Background Concentration	**3.0**		**3.0**		**3.0**	
Maximum PEC	**4.6**		**22.7**		**24.8**	
EAL	**125**		**350**		**266**	
PEC (as a percentage of EAL)	**3.7%**		**6.5%**		**9.3%**	
*** Short term background concentrations are twice the long term background concentration i.e. 2 x 1.5µg/m^3 = 3.0µg/m^3**						

11.182 The results of the modelling assessment demonstrate that predicted 24-hour mean, 1-hour and 15-minute mean SO_2 concentrations are well below the relevant AQALs of 125µg/m^3, 350µg/m^3 and 266µg/m^3 respectively at the selected receptor locations.

11.183 The Medway Air Quality Planning Guidance does not include significance criteria for short term concentrations. The guidance provided by the EPUK & IAQM suggest that for short-term emissions, the impact of emissions from an elevated point source can be assessed to be insignificant if the process contribution is less than 10% of the relevant AQAL.

11.184 The predicted process contributions represent less than 10% of the relevant AQALs for 24 hour, hourly mean and 15 minute mean concentrations at all receptors. Therefore, the likely impact of the Development on concentrations of 24-hour, 1-hour and 15-minute mean SO_2 concentrations at the selected sensitive receptors is insignificant.

11.185 It should be noted that a worst-case assessment has been undertaken with regards to the prediction of concentrations of less than 24 hour averaging periods. As such, the predicted process contributions are likely to be lower than those presented.

11.186 At the sensitive locations identified within the Development, the maximum predicted 1 hour and 15 min mean SO_2 concentrations are 25.1µg/m^3 and 29.4µg/m^3 which are 25.1% and 11.1% of the relevant AQS objective levels respectively. The impact with regards to exposure is therefore also insignificant.

Predicted Total Organic Carbon (as Benzene) Concentrations

11.187 Predicted annual and 1-hour mean TOC process contributions at the identified receptor locations are presented in Table 11.38 below. TOC is not produced from vehicle exhausts in significant quantities. The concentrations presented below are therefore only as a result of

emissions from the possible EfW plant.

Table 11.38: Predicted Benzene Concentrations (μg/m³)

Receptor	Annual Mean		Maximum 1-Hour Mean	
	PC	PC (% AQAL)	PC	PC (% AQAL)
R1	0.03	0.6	2.7	1.4
R2	0.04	0.8	2.6	1.3
R3	0.02	0.3	2.7	1.4
R4	0.01	0.3	2.5	1.3
R5	0.01	0.2	2.7	1.4
R6	0.01	0.3	2.9	1.5
R7	0.02	0.4	2.8	1.4
R8	0.03	0.5	2.5	1.3
R9	0.04	0.9	2.7	1.4
R10	0.03	0.6	2.3	1.2
R11	0.03	0.6	1.9	1.0
R12	0.02	0.3	2.6	1.3
R13	-	-	2.8	1.5
R14	-	-	3.1	1.6
R15	-	-	2.6	1.3
R16	-	-	2.7	1.4
AQAL	**5**		**195**	
Background	**0.4**		**0.8***	
Maximum PEC	**0.46**		**3.87**	
Maximum PEC (% AQS)	**9.2%**		**2.0%**	
*** Short term background concentrations are twice the long term background concentration i.e. 2 x 0.4 μg/m³ = 0.8 μg/m³**				

11.188 The results of the modelling assessment demonstrate that predicted annual mean and 1-hour mean benzene concentrations are well below the relevant AQALs of 5μg/m³ and 195μg/m³ respectively at the selected receptor locations.

11.189 In accordance with the significance criteria provided by the Medway Planning Guidance, the impact on annual mean TOC concentrations is classed as low / imperceptible. In accordance with the significance criteria provided by the EPUK & IAQM guidance the impact is considered to be negligible.

11.190 The Medway Air Quality Planning Guidance does not include significance criteria for short term concentrations. The guidance provided by the EPUK & IAQM suggest that for short-term (hourly) emissions, the impact of emissions from an elevated point source can be assessed to be insignificant if the process contribution is less than 10% of the relevant AQAL.

11.191 The predicted short-term process contributions represent less than 10% of the relevant AQAL.

Therefore, the likely impact of the Development on concentrations of 1-hour mean TOC levels at the selected sensitive receptors is classed as insignificant.

11.192 The maximum predicted 1 hour mean benzene concentration within the Development is 6.59µg/m^3 which is 3.4% of the relevant AQS objective level. The impact with regards to exposure is therefore also insignificant.

Predicted Hydrogen Chloride (HCl) Concentrations

11.193 Predicted 1-hour mean HCl process contributions at the identified receptor locations are presented in Table 11.39 below. HCl is not produced from vehicle exhausts. The concentrations presented below are therefore only as a result of emissions from the possible EfW plant.

Table 11.39: Predicted HCl Concentrations (µg/m^3)

Receptor	1-Hour Mean	
	PC	PC (% AQAL)
R1	8.1	1.1
R2	7.7	1.0
R3	8.0	1.1
R4	7.4	1.0
R5	8.1	1.1
R6	8.6	1.1
R7	8.4	1.1
R8	7.4	1.0
R9	8.1	1.1
R10	7.0	0.9
R11	5.8	0.8
R12	7.8	1.0
R13	8.5	1.1
R14	9.2	1.2
R15	7.8	1.0
R16	8.1	1.1
Background Concentration*	**0.80**	
Maximum PEC	**10.0**	
EAL	**750**	
PEC (as a percentage of EAL)	**1.3%**	
*** Short term background concentrations are twice the long term background concentration i.e. 2 x 0.40µg/m^3 = 0.80µg/m^3**		

11.194 The results of the modelling assessment demonstrate that predicted 1-hour mean HCl concentrations are well below the relevant AQAL which is the AQS objective level of 750µg/m^3 at the selected receptor locations.

11.195 The predicted short-term process contributions represent less than 10% of the relevant AQAL. Therefore, in accordance with the criteria provided by the EPUK & IAQM, the likely impact of the Development on concentrations of 1-hour mean HCl levels at the selected sensitive receptors is classed as insignificant.

11.196 The maximum predicted 1 hour mean HCl concentration within the Development is 18.2µg/m^3 which is 2.4% of the relevant AQS objective level. The impact with regards to exposure is therefore also insignificant.

Predicted Hydrogen Fluoride (HF) Concentrations

11.197 Predicted 1-hour mean HF process contributions at the identified receptor locations are presented in Table 11.40 below. HF is not produced from vehicle exhausts. The concentrations presented below are therefore only as a result of emissions from the possible EfW plant.

Table 11.40: Predicted HF Concentrations (µg/m^3)

Receptor	1-Hour Mean	
	PC	PC (% AQAL)
R1	0.54	0.3
R2	0.51	0.3
R3	0.53	0.3
R4	0.49	0.3
R5	0.54	0.3
R6	0.57	0.4
R7	0.56	0.3
R8	0.49	0.3
R9	0.54	0.3
R10	0.46	0.3
R11	0.39	0.2
R12	0.52	0.3
R13	0.57	0.4
R14	0.61	0.4
R15	0.52	0.3
R16	0.54	0.3
Background Concentration	**6.0***	
Maximum PEC	**6.6**	
EAL	**160**	
PEC (as a percentage of EAL)	**4.1%**	
*** Short term background concentrations are twice the long term background concentration i.e. 2 x 3µg/m^3 = 6.0µg/m^3**		

11.198 The results of the modelling assessment demonstrate that predicted 1-hour mean HF concentrations are well below the relevant AQAL of 160µg/m^3 at the selected receptor

locations.

11.199 The predicted short-term process contributions represent less than 10% of the relevant AQAL. Therefore, in accordance with the criteria provided by the EPUK & IAQM the likely impact of the Development on concentrations of 1-hour mean HF levels at the selected sensitive receptors is classed as insignificant.

11.200 The maximum predicted 1 hour mean HF concentration within the Development is 7.2µg/m^3 which is 4.5% of the relevant AQAL. The impact with regards to exposure is therefore also insignificant.

Predicted Dioxins and Furans Concentration

11.201 The predicted annual mean ground-level dioxin and furan process concentrations at identified sensitive receptor locations are presented in Table 11.41. The results are presented in femtograms (fg) per cubic metre (10-15 g/m^3).

Table 11.41: Predicted Dioxin and Furan Concentrations (fg/m^3)

Receptor	Annual Mean	
	PC	PC (% Background)
R1	0.173	1.8
R2	0.233	2.4
R3	0.104	1.1
R4	0.075	0.8
R5	0.059	0.6
R6	0.083	0.9
R7	0.126	1.3
R8	0.164	1.7
R9	0.261	2.7
R10	0.165	1.7
R11	0.183	1.9
R12	0.097	1.0

11.202 There are no assessment criteria for dioxins and furans. The predicted maximum contribution from the Development is 2.7% of the average background concentration measured at urban monitoring sites in the UK. As the predicted maximum contribution is low in comparison to the average background concentrations, the likely impact is insignificant.

Predicted PAH (as Benzo[a]pyrene) (BaP) Concentrations

11.203 The maximum predicted annual mean ground-level BaP process concentrations are presented

in Table 11.42. The results are presented in nanograms (ng) per cubic metre (10-9 g/m^3).

Table 11.42: Predicted BaP Concentrations (ng/m^3)

Receptor	Annual Mean		
	PC	PC (% EAL)	PC (% of EU Target Value)
R1	0.003	1.1	0.3
R2	0.004	1.5	0.4
R3	0.002	0.7	0.2
R4	0.001	0.5	0.1
R5	0.001	0.4	0.1
R6	0.001	0.5	0.1
R7	0.002	0.8	0.2
R8	0.003	1.1	0.3
R9	0.004	1.7	0.4
R10	0.003	1.1	0.3
R11	0.003	1.2	0.3
R12	0.002	0.6	0.2
Background Concentration	**0.26**		
Maximum PEC	0.264		
EAL	0.25		
AQS	1.0		
PEC (as a percentage of EAL)	105.7%		
PEC (as a percentage of EU Target Value)	26.4%		

11.204 The results of the modelling assessment demonstrate that predicted annual mean BaP process contributions are well below the lowest relevant AQAL of 0.25ng/m^3 at the selected receptor locations. Due to the high background concentration, the predicted PECs are in excess of the this AQAL. It is however, lower than the EU Target level of 1ng/m^3.

11.205 The predicted PC concentrations are in excess of 1% of the EAL of 0.25ng/m^3 at six of the nearby sensitive receptors, but below 1% of the EU Target Level of 1ng/m^3.

11.206 In accordance with the significance criteria provided by the Medway Planning Guidance, the impact is considered to be medium at six and low / imperceptible at the remaining six receptors.

11.207 It should be noted that a worst case assessment has been undertaken with regards to PAHs. Whilst the BAT BREF document does not provide an emission limit for BaP, it does provide a range of likely emission concentrations from measured data at a number of existing plant. The measured concentrations range from 0.004ng/Nm^3 to 1µg/Nm^3. In order to ensure a worst case assessment, the highest emission concentration of 1µg/m^3 was used in the modelling. As the measured data includes older plant, it is likely that the possible new plant

would emit at the lower end of the concentration range.

11.208 Further modelling was undertaken using emission data from an existing plant of a similar size to that which may be included within the Development at the detailed design stage, at which a concentration of BaP of 9.7ng/Nm^3 has been measured. Table 11.43 below indicates the maximum predicted annual mean concentrations predicted at the sensitive receptors for plant emitting at this level.

Table 11.43: Predicted BaP Concentrations (ng/m^3)

Receptor	Annual Mean		
	PC	PC (% EAL)	PC (% of AAD Target Value)
R1	0.000028	0.011	0.003
R2	0.000038	0.015	0.004
R3	0.000017	0.007	0.002
R4	0.000012	0.005	0.001
R5	0.000010	0.004	0.001
R6	0.000014	0.005	0.001
R7	0.000021	0.008	0.002
R8	0.000027	0.011	0.003
R9	0.000042	0.017	0.004
R10	0.000027	0.011	0.003
R11	0.000030	0.012	0.003
R12	0.000016	0.006	0.002
Background Concentration	**0.26**		
Maximum PEC	0.26004		
EAL	0.25		
AQS	1.0		
PEC (as a percentage of EAL)	104.02%		
PEC (as a percentage of AAD Target Value)	26.004%		

11.209 As illustrated in Table 11.43 above, the predicted PC is well below 1% of the most stringent standard of 0.25ng/m^3. In accordance with the Medway Council Air Quality Planning Guidance significance criteria the impact would be low / imperceptible. In accordance with the EPUK & IAQM significance criteria, the impact would be negligible.

Predicted Polychlorinated Biphenyls (PCBs) Concentrations

11.210 The predicted annual and maximum 1-hour mean ground-level PCB process concentrations are presented in Table 11.44. The results are presented in nanograms (ng) per cubic metre (10-9 g/m^3).

Table 11.44: Predicted PCB Concentrations (ng/m^3)

Receptor	Annual Mean		1-Hour Mean	
	PC	PC (% AQAL)	PC	PC (% AQAL)
R1	0.015	0.008	0.711	0.012
R2	0.020	0.010	0.673	0.011
R3	0.009	0.005	0.701	0.012
R4	0.007	0.003	0.651	0.011
R5	0.005	0.003	0.710	0.012
R6	0.007	0.004	0.754	0.013
R7	0.011	0.006	0.733	0.012
R8	0.014	0.007	0.647	0.011
R9	0.023	0.011	0.712	0.012
R10	0.015	0.007	0.611	0.010
R11	0.016	0.008	0.507	0.008
R12	0.009	0.004	0.680	0.011
R13	-	-	0.748	0.012
R14	-	-	0.808	0.013
R15	-	-	0.682	0.011
R16	-	-	0.709	0.012
Background Concentration	**0.089**		**0.178***	
Maximum PEC	**0.112**		**0.986**	
EAL	**200**		**6000**	
PEC (as a percentage of EAL)	**0.056%**		**0.016%**	
*** Short term background concentrations are twice the long term background concentration i.e. 2 x 0.089µg/m^3 = 0.178µg/m^3**				

11.211 The results of the modelling assessment demonstrate that predicted annual mean and hourly mean PCB predicted environmental concentrations are well below the relevant AQALs of 200ng/m^3 and 6000ng/m^3 at the selected receptor locations.

11.212 In accordance with the significance criteria provided in the Medway Planning Guidance, the impact on annual mean concentrations is considered to be low / imperceptible.

11.213 In accordance with the EPUK & IAQM significance criteria, the impact of the Development on annual mean PCB concentrations is negligible. The hourly mean process contributions are all well below 10% of the relevant AQAL, therefore the impact on hourly mean PCB concentrations is considered to be insignificant.

11.214 The maximum predicted 1 hour mean PCB concentration within the Development is 1.7ng/m^3 which is 0.03% of the relevant AQAL. The impact with regards to exposure is therefore also considered to be negligible.

Ammonia (NH_3) Concentrations

11.215 The predicted annual and maximum 1-hour mean ground-level NH_3 process concentrations are presented in Table 11.45.

Table 11.45: Predicted NH_3 Concentrations (µg/m^3)

Receptor	Annual Mean		1-Hour Mean	
	PC	PC (% AQAL)	PC	PC (% AQAL)
R1	0.03	0.02	1.35	0.05
R2	0.04	0.02	1.28	0.05
R3	0.02	0.01	1.33	0.05
R4	0.01	0.01	1.24	0.05
R5	0.01	0.01	1.35	0.05
R6	0.01	0.01	1.43	0.06
R7	0.02	0.01	1.39	0.06
R8	0.03	0.02	1.23	0.05
R9	0.04	0.02	1.35	0.05
R10	0.03	0.02	1.16	0.05
R11	0.03	0.02	0.96	0.04
R12	0.02	0.01	1.29	0.05
R13	-	-	1.42	0.06
R14	-	-	1.53	0.06
R15	-	-	1.29	0.05
R16	-	-	1.35	0.05
Background Concentration	**1**		**2***	
Maximum PEC	**1.04**		**3.43**	
EAL	**180**		**2500**	
PEC (as a percentage of EAL)	**0.58%**		**0.14%**	
*** Short term background concentrations are twice the long term background concentration i.e. 2 x 1.0µg/m^3 = 2.0µg/m^3**				

11.216 The results of the modelling assessment demonstrate that predicted annual mean and hourly mean NH_3 concentrations are well below the relevant AQALs of 180µg/m^3 and 2500µg/m^3 at the selected receptor locations.

11.217 In accordance with the significance criteria provided in the Medway Planning Guidance, the impact on annual mean concentrations is low / imperceptible.

11.218 In accordance with the EPUK & IAQM significance criteria, the impact of the Development on annual mean NH_3 concentrations is classed as negligible. The hourly mean process contributions are all well below 10% of the relevant AQAL, therefore the impact on hourly mean NH_3 concentrations is classed as negligible.

11.219 The maximum predicted 1 hour mean NH_3 concentration within the Development is 4.9µg/m^3 which is 0.2% of the relevant AQAL. The impact with regards to exposure is therefore also negligible.

Trace Metals

11.220 The highest predicted annual mean (long term) trace metals at a sensitive receptor is presented in Table 11.46 below. The maximum concentrations are predicted at receptor R9.

Table 11.46: Predicted Maximum Annual Mean Trace Metals Concentrations (µg/m^3)

Pollutant	Max PC	Background Conc	AQAL	PC (% of AQAL)	PEC (% of AQAL)	Significance / further assessment required
Group I metals						
Cadmium (Cd)	0.00009	0.00025	0.005	1.77	6.77	Insignificant
Thalium (Ti)	0.00009	unknown	1	0.009	0.009	Insignificant
Group II metals						
Mercury (Hg)	0.00009	0.00291	0.25	0.04	1.20	Insignificant
Group III metals						
Antimony (Sb)	0.00130	unknown	5	0.03	0.03	Insignificant
Arsenic (As)	0.00130	0.00098	0.003	43.47	76.14	Insignificant
Lead (Pb)	0.00130	0.012	0.25	0.52	5.32	Insignificant
Chromium III	0.00104	0.002056	5	0.02	0.06	Insignificant
Chromium VI	0.00026	0.000514	0.0002	130.41	387.41	Further Assessment
Cobalt (Co)	0.00130	0.00011	1	0.13	0.14	Insignificant
Copper (Cu)	0.00130	0.0105	10	0.01	0.12	Insignificant
Manganese (Mn)	0.00130	0.00536	0.15	0.87	4.44	Insignificant
Nickel (Ni)	0.00130	0.00102	0.02	6.52	11.6	Insignificant
Vanadium (V)	0.00130	0.00115	5	0.03	0.05	Insignificant

11.221 The highest predicted hourly mean (short-term) trace metals at the sensitive receptors is presented in Table 11.47 below.

Table 11.47: Predicted Maximum Short Term Mean Trace Metals Concentrations (μg/m³)

Pollutant	Max PC	Background Conc	AQAL	PC (% of AQAL)	PEC (% of AQAL)	Significance / further assessment required
Group I metals						
Thalium (Ti)[1]	0.00312	unknown	30	0.010	0.010	Insignificant
Group II metals						
Mercury (Hg)[1]	0.00005	0.00291	7.5	0.001	0.08	Insignificant
Group III metals						
Antimony (Sb)[1]	0.04605	unknown	150	0.031	0.031	Insignificant
Chromium III[1]	0.03684	0.002056	150	0.025	0.027	Insignificant
Cobalt (Co)[1]	0.04605	0.00011	30	0.15	0.15	Insignificant
Copper (Cu)[1]	0.04605	0.0105	200	0.02	0.03	Insignificant
Manganese (Mn)[1]	0.04605	0.00536	150	0.03	0.04	Insignificant
Vanadium (V)[2]	0.01990	0.00115	1	1.99	2.22	Insignificant

[1]Hourly Mean

[2]24 Hourly Mean

11.222 As demonstrated in the Tables above, the Group I and II metals all meet the relevant AQALs and on the basis of the criteria outlined in the EA Risk Assessment Guidance, emissions of these pollutants are insignificant.

11.223 For the Group III metals, on the basis of the Step 1 screening advice provided by the EA, further assessment is required only for long term chromium VI. Emissions of all the remaining trace metals are insignificant.

11.224 The EA guidance note for assessment of Group III metals provides measured concentrations of emissions of metals from Waste Incinerators. In accordance with the guidance note, predictions of chromium VI have been made using the maximum measured concentration. The results are presented in Table 11.48 below.

Table 11.48: Predicted Maximum Long Term Mean Trace Metals Concentrations (using maximum measured values from EA Guidance Note) (μg/m³)

Pollutant	Max PC	Background Conc	AQAL	PC (% of AQAL)	PEC (% of AQAL)	Significance
Chromium VI (Cr VI)	0.00000056	0.000514	0.0002	0.28	257.28	Insignificant

11.225 The results show that at the maximum measured emissions over a range of Waste

Incinerators, the impact of chromium VI emissions are insignificant.

With Highway Improvement Scheme

11.226 A Highway Improvement Scheme has been proposed which aims to alleviate traffic at Four Elms Roundabout. Further modelling has been completed to determine the impact of the Development should the Highway Improvement Scheme be implemented.

11.227 The proposed opening year of the Development is the year 2031. Traffic flows associated with the Highways Infrastructure scheme (HIF) were only available for the year 2028. The flows associated with the Development in the opening year have been added to the flows for this year.

Predicted NO_2 Concentrations

11.228 Annual mean NO_2 concentrations, predicted at the identified receptor locations are presented in Table 11.49 below. As the modelling for the HIF scheme will only affect the receptors affected by road traffic, only the concentrations affected by the road network will be altered. The results presented below are combined emissions from the two models for the receptors affected by the road network.

Table 11.49: Predicted Annual Mean NO_2 Concentrations (µg/m^3)

Receptor	2028		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
R4	14.7	15.4	1.8	Medium
R5	14.8	15.8	2.6	Medium
R12	14.2	14.5	0.6	Low/Imperceptible
R17	16.2	16.9	1.8	Medium
R18	16.1	16.7	1.3	Medium
R19	17.8	18.4	1.7	Medium
R20	20.4	21.8	3.5	Medium
R21	25.0	27.0	5.1	High
R22	25.7	27.6	5.0	High
R23	18.7	19.0	0.9	Low/Imperceptible
R24	20.1	20.6	1.4	Medium
R25	20.4	21.0	1.6	Medium
R26	19.6	20.1	1.2	Medium
R27	20.5	21.1	1.3	Medium
R28	20.9	21.1	0.4	Low/Imperceptible
R29	18.3	18.4	0.3	Low/Imperceptible
R30	18.1	18.3	0.5	Low/Imperceptible
R31	17.9	18.1	0.5	Low/Imperceptible
R32	30.3	30.6	0.9	Low/Imperceptible
R33	26.2	26.4	0.6	Low/Imperceptible
R34	21.0	21.4	1.0	Medium

Receptor	2028		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
R35	19.3	19.5	0.5	Low/Imperceptible
R36	19.5	19.7	0.6	Low/Imperceptible
R37	21.3	21.5	0.6	Low/Imperceptible
R38	23.4	23.5	0.4	Low/Imperceptible
R39	20.1	20.2	0.3	Low/Imperceptible
R40	19.4	19.6	0.6	Low/Imperceptible
R41	20.2	20.4	0.4	Low/Imperceptible
R42	22.3	22.5	0.5	Low/Imperceptible
R43	20.5	20.7	0.5	Low/Imperceptible
R44	25.7	25.9	0.5	Low/Imperceptible
R45	19.8	20.0	0.4	Low/Imperceptible
R46	20.4	20.6	0.4	Low/Imperceptible
R47	17.0	17.1	0.1	Low/Imperceptible
*With Development – includes contribution from traffic and possible energy generating plant for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore do not include a contribution from road traffic either existing or proposed. Only receptors that experience a contribution from road traffic are presented.				

11.229 The results of the modelling demonstrate that in the assessment year of the HIF scheme of 2028, the AQAL for annual mean NO_2 concentrations (40µg/m^3) will be met at all of the receptor locations included within the assessment.

11.230 The operation of the Development is predicted to increase annual mean NO_2 concentrations at the existing receptors included in the assessment. The greatest increase in NO_2 concentrations (2.03µg/m^3 which is 5.1% of the relevant AQAL) is predicted at receptors close to the A228 through Chattenden. Dwellings are located close to the roadside along this section of road which has been designated as an AQMA. In accordance with the Medway Planning Guidance Air Quality Significance criteria set out in Table 11.12, the impact is classed as medium at locations along the key route to the Site and High at two locations in Chattenden. It should be noted that in accordance with the EPUK & IAQM criteria set out in Table 11.14, the impact of the Development on annual mean NO_2 concentrations is classed as negligible.

11.231 As discussed previously, LAQM.TG(16) does not include a conversion between annual and hourly mean NO_2. However, research has determined that where the annual mean NO_2 concentration is below 60µg/m_3, it is unlikely that the hourly mean NO_2 objective will be breached. Whilst it is acknowledged that this relationship was derived for traffic related sources, as the majority of the emissions at the sensitive receptors in the vicinity of the Site are traffic related, this relationship has been used as an indication of the likelihood of exceedances of the hourly mean NO_2 concentration. As the predicted annual mean NO_2 concentrations are well below 60µg/m^3 it is extremely unlikely that the operation of the Development will lead to any breaches of the hourly mean AQS objective level either.

11.232 As the year of assessment of the Development including the HIF scheme is a different year to the year of assessment of the Development without the HIF scheme, the results cannot be directly compared.

Predicted PM_{10} Concentrations

11.233 Predicted annual mean PM_{10} concentrations at the selected receptor locations are presented below in Table 11.50. As the modelling for the HIF scheme will only affect the receptors affected by road traffic, only the predicted concentrations at receptors that are affected by the road network will be altered. The results presented below are combined emissions from the two models for the receptors affected by the road network.

Table 11.50: Predicted Annual Mean PM_{10} Concentrations (µg/m^3)

Receptor	2028		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
R4	16.3	17.0	0.8	Low/Imperceptible
R5	16.6	17.7	1.4	Medium
R12	16.0	16.1	0.2	Low/Imperceptible
R17	16.8	17.6	1.0	Low/Imperceptible
R18	15.9	16.5	0.7	Low/Imperceptible
R19	17.5	18.2	0.9	Low/Imperceptible
R20	18.9	20.4	2.0	Medium
R21	20.4	22.8	3.0	Medium
R22	20.0	22.1	2.6	Medium
R23	17.2	17.4	0.4	Low/Imperceptible
R24	17.9	18.6	0.9	Low/Imperceptible
R25	18.0	18.8	1.0	Low/Imperceptible
R26	17.8	18.3	0.7	Low/Imperceptible
R27	18.3	19.0	0.8	Low/Imperceptible
R28	17.8	17.9	0.2	Low/Imperceptible
R29	17.1	17.1	0.1	Low/Imperceptible
R30	17.3	17.4	0.2	Low/Imperceptible
R31	17.2	17.3	0.1	Low/Imperceptible
R32	18.9	19.2	0.4	Low/Imperceptible
R33	19.4	19.7	0.3	Low/Imperceptible
R34	18.0	18.4	0.5	Low/Imperceptible
R35	17.6	17.8	0.2	Low/Imperceptible
R36	17.9	18.1	0.2	Low/Imperceptible
R37	18.8	19.0	0.3	Low/Imperceptible
R38	19.7	19.8	0.1	Low/Imperceptible
R39	18.3	18.3	0.1	Low/Imperceptible
R40	16.9	17.0	0.2	Low/Imperceptible
R41	18.3	18.4	0.1	Low/Imperceptible
R42	19.2	19.3	0.1	Low/Imperceptible
R43	18.3	18.4	0.1	Low/Imperceptible
R44	19.5	19.7	0.2	Low/Imperceptible
R45	17.3	17.4	0.1	Low/Imperceptible
R46	20.2	20.3	0.1	Low/Imperceptible
R47	17.2	17.2	0.1	Low/Imperceptible

Receptor	2028		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
*With Development – includes contribution from traffic and possible energy generating plant for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore do not include a contribution from road traffic either existing or proposed. Only receptors that experience a contribution from road traffic are presented.				

11.234 The results of the modelling demonstrate that predicted annual mean PM_{10} concentrations are well below (less than 75% of) the AQAL of 40 µg/m^3 at all the selected receptors both with and without the Development operational.

11.235 The operation of the Development is predicted to slightly increase annual mean PM_{10} concentrations at the receptors included in the assessment. The greatest change in PM_{10} concentrations is predicted at receptors close to the roads where the traffic flows are impacted by the Development, in particular at properties close to the roadside along the A226 through Chattenden, which is designated as an AQMA. In accordance with the criteria outlined in the Medway Planning Guidance set out in Table 11.12, the impact is classified as Medium at four roadside receptors and low/imperceptible at the remaining receptors. In accordance with the EPUK & IAQM criteria set out in Table 11.14, the impact of the Development on annual mean PM_{10} concentrations is classed as negligible at all receptor locations.

11.236 For road traffic emissions, LAQM.TG(16) provides a relationship between predicted annual mean concentrations and the likely number of exceedances of the short-term (24-hour mean) PM_{10} objective of 50 µg/m^3 at (N), where:

$$N = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean}).$$

11.237 The objective allows 35 exceedances per year, which is equivalent to an annual mean of 32 µg/m^3.

11.238 Based on the above approach, at the receptors that are impacted by road traffic, the maximum number of days where PM_{10} concentrations are predicted to exceed 50µg/m^3 is 3 without the Development and 5 with the Development with a change of less than two days as a result of the operation of the Development. The impact on 24-hour mean PM_{10} concentrations at the receptors affected by road traffic is therefore considered to be negligible.

Predicted $PM_{2.5}$ Concentrations

11.239 Predicted annual mean $PM_{2.5}$ concentrations at the identified receptor locations are presented in Table 11.51 below. As the modelling for the HIF scheme will only affect the receptors affected by road traffic, only the predicted concentrations at receptors that are affected by the road network will be altered. The results presented below are combined emissions from the two models for the receptors affected by the road network.

Table 11.51: Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m3)

Receptor	2028		Concentration Change due to Development (as a % of the AQAL)	Significance of Impact
	Without Development	With Development*		
R4	10.5	10.7	0.7	Low/Imperceptible
R5	10.7	11.0	1.3	Medium
R12	10.7	10.7	0.2	Low/Imperceptible
R17	10.7	10.9	0.9	Low/Imperceptible
R18	10.5	10.6	0.7	Low/Imperceptible
R19	11.1	11.3	0.8	Low/Imperceptible
R20	11.9	12.3	1.7	Medium
R21	13.1	13.7	2.7	Medium
R22	12.9	13.5	2.4	Medium
R23	11.3	11.3	0.3	Low/Imperceptible
R24	11.8	12.0	0.8	Low/Imperceptible
R25	11.8	12.0	0.9	Low/Imperceptible
R26	11.7	11.8	0.6	Low/Imperceptible
R27	12.4	12.6	0.8	Low/Imperceptible
R28	11.6	11.6	0.2	Low/Imperceptible
R29	11.2	11.3	0.1	Low/Imperceptible
R30	11.3	11.4	0.2	Low/Imperceptible
R31	11.3	11.3	0.1	Low/Imperceptible
R32	12.4	12.5	0.4	Low/Imperceptible
R33	13.0	13.0	0.3	Low/Imperceptible
R34	11.7	11.9	0.5	Low/Imperceptible
R35	11.6	11.6	0.2	Low/Imperceptible
R36	12.2	12.3	0.2	Low/Imperceptible
R37	12.6	12.7	0.3	Low/Imperceptible
R38	13.2	13.2	0.1	Low/Imperceptible
R39	12.4	12.4	0.1	Low/Imperceptible
R41	11.5	11.5	0.2	Low/Imperceptible
R40	12.4	12.4	0.1	Low/Imperceptible
R42	12.9	13.0	0.1	Low/Imperceptible
R43	12.5	12.5	0.1	Low/Imperceptible
R44	13.2	13.3	0.2	Low/Imperceptible
R45	11.9	11.9	0.1	Low/Imperceptible
R46	14.2	14.2	0.1	Low/Imperceptible
R47	11.8	11.8	0.1	Low/Imperceptible

*With Development – includes contribution from traffic and possible energy generating plant for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore do not include a contribution from road traffic either existing or proposed.
Only receptors that experience a contribution from road traffic are presented.

11.240 The results of the modelling assessment demonstrate that predicted annual mean $PM_{2.5}$

concentrations are well below (less than 75% of) the AQAL of 25 µg/m^3 at the selected receptor locations both with and without the Development in operation.

11.241 The operation of the Development is predicted to slightly increase annual mean $PM_{2.5}$ concentrations at the receptors included in the assessment. The greatest change in $PM_{2.5}$ concentrations is predicted at receptors close to the roads where the traffic flows are impacted by the Development, in particular at properties close to the roadside along the A228 through Chattenden, which is designated as an AQMA. In accordance with the criteria outlined in the Medway Planning Guidance set out in Table 11.12, the impact is classified as Medium at four roadside receptors and low/imperceptible at the remaining receptors. In accordance with the EPUK & IAQM criteria set out in Table 11.14, the impact of the Development on annual mean $PM_{2.5}$ concentrations is classed as negligible at all receptor locations.

Assessment of Likely Significant Effects on Ecologically Sensitive Sites

Airborne Concentrations of NO_x, SO_2 and HF

11.242 The maximum ground level PC of NO_x, SO_2 and HF concentrations arising from the possible EfW plant predicted over the five years of meteorological data at the sensitive habitat sites are presented in Table 11.52 below.

Table 11.52: Predicted Airborne Concentrations (µg/m^3)

Receptor	CL	PC	PC (% CL)
Annual Mean NO_x			
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (north of the River Medway Estuary)	30	0.91	3.04
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (south of the River Medway Estuary)		0.24	0.80
Thames Estuary & Marshes Ramsar Site / SPA		0.29	0.97
Queendown Warren SAC		0.06	0.19
Daily Mean NO_x			
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (north of the River Medway Estuary)	75	13.10	17.47
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (south of the River Medway Estuary)		4.95	6.60
Thames Estuary & Marshes Ramsar Site / SPA		1.99	2.65
Queendown Warren SAC		0.98	1.31
Annual Mean SO_2			
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (north of the River Medway Estuary)	20	0.23	1.14
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (south of the River Medway Estuary)		0.06	0.30
Thames Estuary & Marshes Ramsar Site / SPA		0.07	0.36
Queendown Warren SAC		0.01	0.07

Receptor	CL	PC	PC (% CL)
Annual Mean NH_3			
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (north of the River Medway Estuary)	3	0.08	2.53
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (south of the River Medway Estuary)		0.02	0.66
Thames Estuary & Marshes Ramsar Site / SPA		0.02	0.81
Queendown Warren SAC		0.005	0.16
Weekly Mean HF			
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (north of the River Medway Estuary)	0.5	0.04	7.73
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (south of the River Medway Estuary)		0.02	4.05
Thames Estuary & Marshes Ramsar Site / SPA		0.06	1.72
Queendown Warren SAC		0.02	0.44
Daily Mean HF			
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (north of the River Medway Estuary)	5	0.11	2.18
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (south of the River Medway Estuary)		0.04	0.82
Thames Estuary & Marshes Ramsar Site / SPA		0.02	0.33
Queendown Warren SAC		0.01	0.16

11.243 The EA provides national screening criteria for determining the significance of an impact of emissions of pollutants on sensitive ecological sites. For long term or annual mean impacts the guidance provides screening criteria in two stages. Firstly, the process contribution (PC) is compared against 1% of the relevant Critical Level. If the PC is less than 1% of the Critical Level the impact can be considered to be insignificant. If it is higher than 1% of the Critical Level, then the overall predicted environmental concentration (PEC) is calculated by adding the background concentration. If the PEC is less than 70% of the relevant Critical Level, the impact can be considered to be insignificant. If the PEC is higher than 70% of the Critical Level, further consideration of the sensitivity of the specific habitat to the pollutant is required.

11.244 The annual mean NO_x, SO_2 and NH_3 process contributions (PCs) are below 1% of the relevant Critical Levels at all of the identified sensitive habitat sites and with the exception of the Medway Estuary & Marshes SPA, SSSI and Ramsar site to the north of the River Medway Estuary.

11.245 The annual mean PECs were therefore calculated for the Medway Estuary & Marshes SPA, SSSI and Ramsar site. Background concentrations for NO_x, SO_2 and NH_3 of 19.9µg/m^3, 1.1µg/m^3 and 1.0µg/m^3 respectively were determined for this site and added to the PCs to calculate the PECs. A maximum PEC of 19.9µg/m^3 was calculated for annual mean NO_x, 1.4µg/m^3 for annual mean SO_2 and 1.1µg/m^3, all of which are less than 70% of the relevant Critical Levels. The impact of the Development on annual mean NO_x, SO_2 and NH_3

concentrations at the sensitive ecological habitats is therefore considered to be insignificant.

11.246 The EA screening criteria states that if a short-term PC is less than 10% of the relevant Critical Level, the impact can be considered to be insignificant.

11.247 The daily mean NOx PCs are well below 10% of the relevant Critical Level (75µg/m^3) at all of the identified sensitive habitat sites with the exception of the Medway Estuary & Marshes SPA, SSSI and Ramsar site to the north of the River Medway Estuary. The maximum PEC within the Medway Estuary & Marshes site was calculated to be 52.8µg/m^3 which is 70.4% of the Critical Level. As this is well below the Critical Level it is considered that the Critical Level is unlikely to be breached although the impact cannot be considered to be insignificant in accordance with the EA screening criteria. Further consideration has therefore been given to the sensitivity of the Medway Estuary & Marshes to airborne NOx concentrations.

11.248 The area within the Medway Estuary & Marshes that is predicted to experience a PC in excess of 10% of the Critical Level is presented in Figure 11.3. The area is approximately 52ha (approximately 1.1% of the total area of the site). The habitats within these areas are largely saltmarsh and mudflats which are regularly inundated and flushed through with the tide. Such areas are typically affected to a greater extent from sources such as agriculture rather than airborne NOx. The annual mean NOx concentrations are of greater importance to such areas than daily mean concentrations as any exceedance would be for a short duration and the area would be able to recover. Taking into consideration both the sensitivity of the site to airborne NOx, the proportion of the site predicted to experience a PC of greater than 10% of the Critical Level and that the predicted PEC is unlikely to exceed the Critical Level, the impact of the Development on daily mean NOx concentrations is considered to be insignificant.

11.249 The daily mean NOx Critical Level of 75µg/m^3 is set in the WHO Guidelines. This was originally set at 200µg/m^3. The WHO Guidelines state that *'Experimental evidence exists that the Critical Level decreases from around 200µg/m^3 to 75µg/m^3 when in combination with ozone or SO_2 at or above the critical levels. In the knowledge that short term episodes of elevated NO_x concentrations are generally combined with elevated concentrations of ozone or SO_2, 75µg/m^3 is proposed for the 24 hour mean'.* The IAQM guidance recommends that given the ozone and SO_2 concentrations are typically low in the UK compared to many other countries, that it is most appropriate to use a Critical Level of 200µg/m^3. The predicted daily mean NOx PC is lower than 10% of a level of 200µg/m^3.

11.250 The daily mean and weekly mean HF PCs are below 10% of relevant Critical Levels at all of the identified sensitive habitat sites. The impact of the Development on daily and weekly HF concentrations is therefore considered to be insignificant.

11.251 The Chattenden Woods and Lodge Hill SSSI is located in excess of 2km from the Site and therefore the impact of the emissions arising from the possible EfW plant is not considered. A section of the SSSI is located within 200m of a road affected by the traffic generated by the Development, an assessment has therefore been undertaken to determine the effects of emissions from road transport on the airborne NOx concentrations within the SSSI. The PC arising from the vehicle emissions from the additional traffic generated by the Development within 2 x 200m transects from the A228 which passes close to the SSSI are presented in Table 11.53 below.

Table 11.53: Predicted Airborne NOx concentrations (µg/m^3)

Transect ID	Distance from Road	Impact (as % of CL)	PEC	PEC (as % of CL)
E4A	5	5.9	27.6	92.1
	10	5.2	26.6	88.7
	15	4.6	25.8	85.9
	20	4.1	25.2	84.0
	25	3.8	24.7	82.4
	30	3.5	24.3	81.1
	40	3.0	23.7	79.1
	50	2.7	23.2	77.5
	60	2.4	22.9	76.3
	70	2.2	22.6	75.3
	80	2.0	22.4	74.5
	90	1.8	22.2	73.8
	100	1.7	22.0	73.3
	125	1.4	21.7	72.2
	150	1.3	21.4	71.4
	175	1.1	21.2	70.8
	200	1.0	21.1	70.3
E4B	5	8.6	31.8	105.8
	10	6.9	29.4	98.2
	15	5.9	28.0	93.2
	20	5.1	26.9	89.5
	25	4.4	26.0	86.7
	30	4.0	25.4	84.6
	40	3.3	24.5	81.6
	50	2.8	23.8	79.4
	60	2.5	23.3	77.8
	70	2.2	23.0	76.5
	80	2.0	22.7	75.6
	90	1.9	22.4	74.8
	100	1.7	22.2	74.2
	125	1.5	21.9	73.0
	150	1.3	21.6	72.1
	175	1.2	21.4	71.4
	200	1.0	21.3	70.9

11.252 Within the transect of 200m from the roadside the predicted annual mean NO_x process contributions (PCs) are above 1% of the relevant Critical Level.

11.253 The annual mean PECs were therefore calculated, a background concentration for NO_x of

19.6µg/m^3 was determined for this site and added to the PCs to calculate the PECs. As illustrated in Table 11.50 above, the PECs within 200m of the roadside are above 70% of the Critical Level, therefore in accordance with the EA screening criteria, the impact cannot be considered to be insignificant. Further consideration has therefore been given to the sensitivity of the Chattenden Woods and Lodge SSSI to airborne NOx concentrations.

11.254 The SSSI is designated on the basis of its woodland, unimproved neutral grassland and population of Nightingales. The Nightingales would not be sensitive to changes in airborne NOx concentrations. The SSSI citations states the area of grassland which forms the reasons for the designation is at Rough Shaw and Lodge Hill Training Area which are at least 700m from the A228. The nearest ancient woodland component which would be most sensitive to NOx is approximately 750m from the A228. At these distances, the impact of the emissions from road traffic would be insignificant.

11.255 Small areas of woodland are located closer to the road, areas designated at Priority Habitats are located at around 15m and 45m from the roadside. These areas are currently in favourable condition. The results indicate that the Critical Level is only likely to be exceeded at locations within 5m of the roadside. It should be noted that the assessment presents the worst-case assessment with regards to local background concentrations, i.e. the background concentrations are assumed to remain at current levels in the future years. In reality, it is likely that background concentrations may reduce in the future. Taking into account, the condition of the woodland, the fact that the Critical Level is not predicted to be exceeded in the locations of the Priority Habitats and that a worst case assessment has been undertaken in terms of the background concentration, it is considered that the impact on this habitat from the emissions from the additional road traffic generated by the Development would be insignificant.

Eutrophication

11.256 Predicted maximum nutrient nitrogen deposition rates arising from emissions of NO_x from the possible EfW plant within the Development are presented in Table 11.54. The PCs are compared with the relevant critical loads (CLd) and combined with the relevant background concentrations.

Table 11.54: Predicted Eutrophication Rates (kg N/ha/yr)

Habitat Site	PC	Background Deposition	Total Deposition	CL_d	PC (% CL_d) *	PEC (% CLd)
Medway Estuary & Marshes Ramsar Site / SPA / SSSI	0.53	10.6	11.13	20 to 30	2.6	55.6

(north of the River Medway Estuary)						
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (south of the River Medway Estuary)	0.14	10.6	10.74	20 to 30	0.7	53.7
Thames Estuary & Marshes Ramsar Site / SPA	0.17	12	12.17	20 to 30	0.8	60.8
Queendown Warren SAC	0.03	15.5	15.53	15 to 25	0.2	103.6
* Presented as a percentage of the lowest critical level for the habitat types within the area						

11.257 The maximum PC nutrient nitrogen deposition rates arising from the Development are low in comparison to the critical loads and the background concentrations. At Medway Estuary and Marshes Ramsar site, SPA and SSSI north of the River Medway the maximum predicted PC is greater than 1% of the relevant Critical Load, however the PEC is less than 70% of the Critical Load. Therefore, the impact is considered to be insignificant.

11.258 Predicted nutrient nitrogen deposition rates arising from the vehicle emissions of the additional traffic generated by the Development within 2 x 200m transects from the A228 which passes adjacent to the Chattenden Woods and Lodge SSSI are presented in Table 11.55 below.

Table 11.55: Predicted Eutrophication Rates (kg N/ha/yr)

Transect ID	Distance from road	PC	Background Deposition	Total Deposition	CL_d	PC (% CL_d)*
E4A	5	0.51	24.1	24.6	15 to 20	3.4
	10	0.45	24.1	24.5		3.0
	15	0.39	24.1	24.5		2.6
	20	0.36	24.1	24.5		2.4
	25	0.32	24.1	24.4		2.2
	30	0.30	24.1	24.4		2.0
	40	0.26	24.1	24.4		1.7
	50	0.23	24.1	24.3		1.5
	60	0.21	24.1	24.3		1.4
	70	0.19	24.1	24.3		1.2
	80	0.17	24.1	24.3		1.1
	90	0.16	24.1	24.3		1.0
	100	0.15	24.1	24.2		1.0
	125	0.12	24.1	24.2		0.8
	150	0.11	24.1	24.2		0.7
	175	0.10	24.1	24.2		0.6
	200	0.09	24.1	24.2		0.6
E4B	5	0.75	24.1	24.8	15 to 20	5.0
	10	0.60	24.1	24.7		4.0
	15	0.51	24.1	24.6		3.4
	20	0.44	24.1	24.5		2.9
	25	0.38	24.1	24.5		2.6
	30	0.35	24.1	24.4		2.3
	40	0.29	24.1	24.4		1.9
	50	0.25	24.1	24.3		1.6
	60	0.22	24.1	24.3		1.4

	70	0.19	24.1	24.3		1.3
	80	0.18	24.1	24.3		1.2
	90	0.16	24.1	24.3		1.1
	100	0.15	24.1	24.2		1.0
	125	0.13	24.1	24.2		0.9
	150	0.11	24.1	24.2		0.7
	175	0.10	24.1	24.2		0.7
	200	0.09	24.1	24.2		0.6

11.259 The predicted PC nutrient nitrogen deposition rates arising from the road vehicles generated by the Development are relatively low in comparison to the critical loads and the background concentrations. Taking into consideration, the location of the sensitive elements of the SSSI and the condition of the elements close to the road as discussed above, the impact is considered to be insignificant.

Acidification

11.260 Predicted maximum acid deposition rates arising from the possible EfW plant predicted over the five years of meteorological data are presented in Table 11.56. The PCs are compared with the relevant critical loads (CLd) and combined with the relevant background concentrations.

Table 11.56: Predicted Acid Deposition Rates (keq/ha/yr)

Habitat Site	PC (N)	PC (S)	PC (Total)	PC (% CL_d function)
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (north of the River Medway Estuary)	0.0376	0.0397	0.08	7.2
Medway Estuary & Marshes Ramsar Site / SPA / SSSI (south of the River Medway Estuary)	0.0098	0.0104	0.02	1.2
Thames Estuary & Marshes Ramsar Site / SPA	0.0119	0.0126	0.02	2.7
Queendown Warren SAC	0.0024	0.0025	0.005	0

11.261 For the assessment of acid deposition, the most stringent Critical Loads have been used for the habitat types within each ecological site and the maximum background deposition rates as provided by APIS. The assessment can therefore be considered to be worst case. The maximum PC acid deposition rates arising from the possible plant are low in comparison to the critical load functions and the background concentrations. Therefore, the impact is considered to be insignificant.

Mitigation Measures

Construction Phase

11.262 The control of dust emissions from construction site activities relies upon management provision and mitigation techniques to reduce emissions of dust and limit dispersion. Where dust emission controls have been used effectively, large-scale operations have been successfully undertaken without impacts to nearby properties.

11.263 Overall medium risk of effects is predicted during the construction phase of the Development. Appropriate mitigation measures for the Site have been identified following the IAQM guidance and based on the risk effects presented in Table 11.25. The 'highly recommended' measures set out within the IAQM guidance and reproduced below will be incorporated into a Dust Management Plan (DMP) and approved by MC prior to the commencement of any work on Site It would be secured by an appropriately worded planning condition.

11.264 The IAQM guidance recommends that developments that are determined to have a high or medium risk of effects should undertake monitoring of dust and/or PM_{10} prior to and during the construction works. As the risk of dust effects has been determined to be medium for dust and ecological effects, it is considered that monitoring will be required. The duration and positioning of monitoring would be discussed and agreed with Medway Council.

'Highly Recommended' Measures to be implemented on-site and secured through the DMP

- develop and implement a stakeholder communications plan that includes community engagement before work commences on the Site;
- display the name and contact details of the person accountable for air quality and dust issues on the Site boundary (i.e. the environment manager/engineer or Site manager);
- display the head or regional office contact information on the Site boundary;
- record all dust and air quality complaints, identify cause, take appropriate measures to reduce emissions in a timely manner and record the measures taken;
- make the complaints log available to Medway Council when asked;
- record any exceptional 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;
- carry out regular Site inspections, record inspection results and make inspection log available to Medway Council when asked;

- increase frequency of Site inspection 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 periods of dry or windy conditions;
- plan Site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles;
- fully enclose the Site or specific operations where there is a high potential for dust production and the Site is active 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.
- cover, seed or fence stockpiles to prevent wind whipping;
- 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;
- produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials;
- 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 Site for effective dust/particulate matter 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 such equipment wherever appropriate;
- ensure equipment is readily available on the Site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods;
- avoid bonfires and burning of waste materials; and
- ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

11.265 In addition to the 'highly recommended' measures, the IAQM guidance also sets out a number of 'desirable' measures which should be considered. Those of relevance to the Development are also set out below and can also be secured by an appropriately worded planning condition to the extent necessary:

- undertake daily on-Site and off-Site inspection, where receptors (including roads) are nearby to monitor dust, record inspection results and make the log available to MC when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the Site boundary, with cleaning to be provided if necessary;
- impose and signpost a maximum speed limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas;
- implement at Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car sharing);
- re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces;
- use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil;
- only remove the cover in small areas during work and not all at once;
- avoid scabbling (roughening of concrete surfaces) if possible;
- ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- for smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

Construction Traffic

11.266 The results of the assessment demonstrate that the likely impact of the construction traffic on local air quality would be low / imperceptible. Therefore, no mitigation measures are required.

Operational Phase

11.267 The results of the assessment demonstrate that the impact of the operation of an EfW plant should one come forward within the parameters of the outline application is likely to be low/imperceptible or negligible with regards to human health.

11.268 Although potentially significant impacts are predicted with regards to daily airborne NOx concentrations within the nearest ecological site (Medway Estuary & Marshes SPA, SSSI and Ramsar site) in accordance with the EA screening criteria, following consideration of the likely sensitivity of this site the impacts are considered to be insignificant also.

11.269 In accordance with the Medway Council Air Quality Planning Guidance significance criteria the

impact on a number of receptors along the nearby road network are predicted to experience a medium impact as a result of the additional road traffic associated with the Development.

11.270 In order to minimise the likely impact from transport related emissions, a Framework Travel Plan has been prepared for the Development (refer to Volume 3 Transport Assessment of the ES), it contains a number of measures for mitigating the impact of Development-generated traffic including:

- The provision of electric vehicle charging points (10% of parking spaces will be provide with electric charging points in link with the guidance provided in the Medway Council Air Quality Planning Guidance);
- The promotion of a car share scheme and dedicated car share spaces;
- The provision of a car club;
- The provision of cycle parking and changing and washing facilities;
- The provision of a cycle route on Eschol Road and through the Site linking each building plot; and
- The provision of a bus service including the diversion for existing services and staff shuttle services.

11.271 The Travel Plan will include a target for reduced single occupancy car trips, this will likely be a 10% reduction.

11.272 A planning condition will secure the implementation of the Travel Plan, monitoring and update (refer to Chapter 10 Transport and Access and Volume 3 Transport Assessment of the ES for more details).

Emissions Mitigation Assessment

11.273 In accordance with the Medway Council Air Quality Planning Guidance, an Emissions Mitigation Assessment has been undertaken. Based on the traffic data provided by the transport consultants, the number of annual trips generated by the operational Development would be 3,251,420 per annum.

11.274 Using the EFT spreadsheet, the total annual emissions of NOx and $PM_{2.5}$ have been calculated as set out in Table 11.57 below. The assessment has assumed an average speed of 48kph and an average distance travelled of 10km per vehicle. The emissions have been calculated based the future 2037 operational year.

Table 11.57: Predicted Acid Deposition Rates (keq/ha/yr)

Pollutant	Annual Emissions (kg/yr)
NOx	4721.75
$PM_{2.5}$	741.28

11.275 The latest damage costs have been obtained from the Defra Air Quality Appraisal Damage Cost Guidance[xix]. Although the Site is located in a rural location, the Development traffic will pass through the nearby town of Chattenden which would be classed as a small urban town. The damage costs for a small urban town have therefore been used in the damage cost calculation.

11.276 Using the formula provided in the Medway Council Air Quality Planning Guidance:

Five Year Exposure Cost = EFT output x Damage Cost x 5 years

the total damage cost for the appeal scheme over the first 5 years is calculated as £147,578 for NOx and £206,731 for $PM_{2.5}$ giving a total damage cost of £354,309. This is the total cost which should be spent on mitigation measures aimed at reducing emissions to air from the operational Development. It would be spent on-site through the implementation of mitigation measures such as the Travel Plan and electric vehicle charging points.

Residual Effects

Construction Phase

11.277 Following implementation of the measures recommended above the impact of emissions during the construction of the Development would be negligible.

Construction Traffic

11.278 The residual impact of the construction traffic would remain low/imperceptible in accordance with the Medway Council's significance criteria and negligible in accordance with the EPUK & IAQM significance criteria.

Operational Phase

11.279 The proposed measures as described above aim to discourage the use of private car travel and promote the use of more sustainable travel. These measures will reduce the impact of the emissions from vehicles using the local roads, however the effect cannot be quantified.

In accordance with the Medway Council Air Quality Planning Guidance significance criteria, the residual effects are therefore considered to remain as medium at some receptors along some local roads on the key route to the Site and low / imperceptible at the remaining locations. In accordance with the EPUK & IAQM Guidance, the residual effects are considered to remain negligible.

Cumulative Effects

11.280 Cumulative effects can potentially be experienced during both the construction and operational phases. During the construction phase, cumulative effects of dust and particulate matter generated from on-site activities may be experienced in locations in close proximity to two or more development sites and the timing of the construction phases overlap. There may also be an effect due to the increased construction traffic on local roads if construction vehicles are to use the same routes to access the sites. During the operational phase, cumulative effects may be experienced due to the additional road vehicles generated by one or more scheme if the traffic is likely to affect the same local roads.

11.281 A number of committed developments have been considered cumulatively within this assessment. These schemes are outlined in Chapter 2 EIA Methodology of the ES.

Construction Phase

11.282 Guidance provided by the IAQM suggests that effects of dust and particulate matter generated from a construction site should be considered at human receptors up to 350m from a site and 50m from a sensitive ecological habitat. The majority of the committed developments are too distant from the Site to result in any cumulative effects arising from dust and particulate matter generated by the on-site construction activities.

11.283 An extension to Damhead Creek Power Station (Damhead Creek II) is proposed on land adjacent to the northern boundary of the Site. There are a number of commercial properties within the existing Industrial Estate that are located within 350m of the Site and the committed development and also a small area of the Medway Estuary & Marshes SPA, SSSI and Ramsar Site. These receptors were considered as sensitive receptors with medium sensitivity within the construction assessment presented above. The residual risk of effects arising from the Site following mitigation is considered to be negligible. It is considered likely that the construction activities within the committed development site would also be subject to the same mitigation measures as they are standard best practice measures, therefore following mitigation the cumulative impacts will be negligible.

11.284 A business park is currently under construction (Kingsnorth Industrial Estate (MC/08/0370) approximately 500m to the north of the Site. There are a number of commercial properties within the existing Industrial Estate and at the Damhead Creek Power Station that are located within 350m of both the Site and the committed business park development and also a small area of the Medway Estuary & Marshes SPA, SSSI and Ramsar Site. These receptors were considered as sensitive receptors with medium sensitivity within the construction assessment presented above. The residual risk of effects arising from the Site following mitigation is considered to be negligible. It is considered likely that the construction activities within the committed business park would also be subject to the same mitigation measures, therefore following mitigation the cumulative impacts will be negligible.

11.285 An extraction and processing of sand and gravel operation is currently operating on land to the south of Stoke Road, the restoration works to restore this land for agricultural use is considered as a committed development. There are a small number of residential properties along Eschol Road and Jacobs Lane and also a farm and kennels within 350m of both the Site and this development. These receptors were considered as sensitive receptors with high sensitivity within the construction assessment presented above. The residual risk of effects arising from the Site following mitigation is considered to be negligible. It is considered that the restoration activities within this site would also be subject to the same mitigation measures, therefore following mitigation the cumulative impacts will be negligible.

Operational Phase

11.286 The traffic flows used for the assessment include the committed developments in the area. The assessment of the significance of the Development's effects has therefore taken into account the cumulative effect of the Development and the committed developments within regards to emissions from road traffic.

11.287 With regards to emissions to air from the on-site operations at the committed developments, the only application of concern with regards to air quality is the Damhead Creek II Power Station which comprises the provision of a Combined Cycle Gas Turbine (CCGT) electricity generating station up to 1800MW capacity including a 300MW Open Cycle Gas Turbine (OCGT) peaking plant.

11.288 An assessment of the impact of emissions to air arising from the proposed CCGT/OCGT plant was completed for in support of the planning application. This assessment has been reviewed to inform this assessment.

11.289 Emissions to air arising from the proposed CCGT/OCGT plant comprise NOx and CO. Of these

pollutants, only emissions of NOx are considered likely to have any significant effect due to the low background concentrations and emissions of CO.

11.290 Within the assessment undertaken for the Damhead Creek II Power Station application, detailed modelling was undertaken to determine the likely pollutant concentrations at the nearby sensitive receptors (both human health and ecological). The results indicated that the greatest annual mean NO_2 process contribution predicted at a sensitive human receptor as a result of the proposed power station was 0.5µg/m^3 and the greatest PC predicted within the study area is 2.2µg/m^3. With regards to the sensitive ecological habitats, the greatest annual mean NOx process contribution predicted within the Medway Estuary & Marshes SPA, SSSI and Ramsar site was 2.96µg/m^3.

11.291 It is considered that the presence of the proposed Damhead Creek II Power Station would increase the background concentrations in the vicinity of the Site. Further assessment was therefore undertaken to determine the overall concentrations at the sensitive receptors considering the additional emissions arising from the proposed power station. Predicted annual mean NO_2 concentrations at the selected sensitive receptors assuming an increase in the background NO_2 concentrations of 2.2µg/m^3 (the greatest PC predicted from the power station) across the study area are presented in Table 11.58 below.

Table 11.58: Predicted Annual Mean NO_2 Concentrations (µg/m^3)

Receptor	2037		Concentration Change due to Development (as a % of the objective)	Significance of Impact
	Without Development	With Development*		
R1	-	15.6	0.7	Low/Imperceptible
R2	-	15.3	0.9	Low/Imperceptible
R3	-	15.6	0.5	Low/Imperceptible
R4	16.0	16.5	1.6	Medium
R5	16.3	17.1	2.2	Medium
R6	-	15.6	0.4	Low/Imperceptible
R7	-	15.6	0.5	Low/Imperceptible
R8	-	14.5	0.6	Low/Imperceptible
R9	-	14.5	1.0	Low/Imperceptible
R10	-	14.5	0.6	Low/Imperceptible
R11	-	14.2	0.7	Low/Imperceptible
R12	16.3	16.4	0.6	Low/Imperceptible
R13	-	14.6	0.4	Low/Imperceptible
R14	-	15.6	0.3	Low/Imperceptible
R15	-	14.6	1.0	Low/Imperceptible
R16	-	14.6	1.3	Medium
R17	17.6	18.1	1.5	Medium
R18	17.7	18.1	1.1	Medium
R19	18.9	19.4	1.5	Medium
R20	20.5	21.6	3.0	Medium
R21	24.2	25.9	4.5	Medium
R22	25.0	26.8	4.7	Medium

Receptor	2037		Concentration Change due to Development (as a % of the objective)	Significance of Impact
	Without Development	With Development*		
R23	20.3	20.5	0.7	Low/Imperceptible
R24	21.6	22.0	1.3	Medium
R25	21.7	22.2	1.5	Medium
R26	21.2	21.6	1.1	Medium
R27	21.6	22.1	1.3	Medium
R28	22.5	22.5	0.4	Low/Imperceptible
R29	19.5	19.6	0.2	Low/Imperceptible
R30	20.0	20.1	0.5	Low/Imperceptible
R31	19.9	20.0	0.4	Low/Imperceptible
R32	30.4	30.6	0.8	Low/Imperceptible
R33	26.8	27.0	0.6	Low/Imperceptible
R34	21.6	21.9	1.0	Low/Imperceptible
R35	20.6	20.7	0.5	Low/Imperceptible
R36	20.6	20.8	0.5	Low/Imperceptible
R37	22.5	22.7	0.6	Low/Imperceptible
R38	24.1	24.2	0.3	Low/Imperceptible
R39	21.5	21.5	0.3	Low/Imperceptible
R40	20.4	20.6	0.6	Low/Imperceptible
R41	21.2	21.2	0.4	Low/Imperceptible
R42	22.4	22.5	0.4	Low/Imperceptible
R43	21.5	21.6	0.5	Low/Imperceptible
R44	26.9	27.0	0.5	Low/Imperceptible
R45	21.3	21.4	0.4	Low/Imperceptible
R46	22.1	22.2	0.3	Low/Imperceptible
R47	18.9	19.0	0.2	Low/Imperceptible
*With Development – includes contribution from traffic and possible energy generating plant for receptors R4, R5, R12, R17 to R47. Receptors R1 to R3, R6 to R11 and R13 to R16 are distant from the roads impacted by the development, therefore do not include a contribution from road traffic either existing or proposed. Without Development concentrations for Receptors R1 to R3, R6 and R16 can be considered to be the background concentrations only and therefore not presented in the table. Receptors R13 to R16 are short term receptors, therefore the annual mean standards and significance criteria are not applicable at these locations.				

11.292 The results of the modelling demonstrate that in the assessment year of 2037, with the additional emissions arising from the proposed Damhead Creek II Power Station, the relevant AQAL which is the AQS objective level for annual mean NO_2 concentrations (40µg/m^3) will still be met at all of the receptor locations included within the assessment.

11.293 The impact of the operation of the Development remains the same at all receptors with the additional concentrations arising from the Damhead Creek II Power Station.

11.294 In accordance with the Medway Planning Guidance Air Quality Significance criteria set out in Table 11.12, the impact of the Development, with the Damhead Creek II Power Station operational, is classed as medium at locations along the key route to the Site. In accordance with the EPUK & IAQM criteria set out in Table 11.14, the impact of the Development on annual mean NO_2 concentrations remains negligible with the inclusion of the additional pollutant concentrations arising from the proposed power station.

11.295 As the predicted annual mean NO_2 concentrations are well below 60µg/m^3 it is extremely unlikely that the operation of the Development will lead to any breaches of the hourly mean AQS objective level either. It is noted, however, that the Damhead Creek II Power Station also leads to increases in hourly mean NO_2 concentrations. The assessment undertaken for the Damhead Creek II Power Station application predicted a maximum hourly NO_2 PC of 38.6µg/m^3 and a PEC of 35.5% of the objective level. Whilst it is not possible to add the maximum predicted hourly mean NO_2 concentration arising from the power station to the predicted hourly mean concentrations arising from the Development as this would not represent the likely concentrations, it is clear that the standard would not be breached.

11.296 The predicted annual mean NO_x concentrations at the Medway Estuary & Marshes SPA, SSSI and Ramsar site assuming an increase in the background NO_x concentrations of 2.96µg/m^3 is 23.7µg/m^3 which is 79.1% of the Critical Level. As this is greater than 70% of the Critical Level, the cumulative impact cannot be considered to be insignificant in accordance with the EA screening criteria. However, the Critical Level is not likely to be exceeded. It is also unlikely that the location of the maximum predicted concentration arising from the Damhead Creek II Power Station would be at the same location as the maximum predicted concentration arising from the Development.

11.297 The Air Quality Report produced for the Damhead Creek II Power Station concluded that the emissions of NOx arising from the proposed plant would not adversely affect the SSSI.

11.298 As discussed previously, the Medway Estuary & Marshes site is regularly inundated and flushed through with the tide making sources such as agriculture a greater influence on the habitat than airborne NOx. Considering this and that the Critical Level for annual NOx is not likely to be exceeded, it is considered that the cumulative effect of the combined airborne NOx concentrations would not adversely affect the ecological site.

11.299 The maximum nitrogen deposition rates arising from the Damhead Creek II Power Station within the Medway Estuary & Marshes SPA, SSSI and Ramsar site is 0.43 kg N/ha/yr which is 2.2% of the Critical Load. If the PCs arising from Development and the Damhead Creek II Power Station are combined, the total nitrogen deposition rate would be 0.88 kg/N/yr which is 4.4% of the Critical Load. Taking into consideration the fact that the maximum deposition rates arising from the two sources are unlikely to be in the same location, that the Critical Load is unlikely to be breached and the sensitivity of the ecological site, it is considered that the cumulative effect of the combined nitrogen deposition would not adversely affect the ecological site.

Summary

11.300 An air quality impact assessment has been undertaken to assess both construction and operational effects associated with the Development.

11.301 An assessment of the potential effects during the construction phase identified that releases of dust and particulate matter are likely to occur during site activities. Through good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate matter releases may be effectively mitigated and the resultant effects are negligible.

11.302 Dispersion modelling has been carried out to assess the impact of the operation of the Development on local air quality. The assessment has shown that pollutant concentrations are predicted to be below the relevant limits at the sensitive human receptors in the vicinity of the Site. The impact is determined to be medium in accordance with the Medway Council Air Quality Planning Guidance significance criteria at a number of receptors along the key roads leading to the Site in particular along the A228. In accordance with the significance criteria provided by the EPUK & IAQM, the impact is classed as negligible.

11.303 A habitats assessment was also undertaken to ascertain the impact of the Development on nearby sensitive ecological habitats with regards to airborne pollutants and deposition of nitrogen and acid. The assessment determined that there will be an insignificant impact on the ecological habitats.

11.304 A number of mitigation measures were proposed which will reduce the impact arising from the construction phase and reduce the impact of the Development with regards to emissions from road traffic.

11.305 Table 11.59 contains a summary of the likely significant effects of the Development.

Table 11.59: Table of Significance – Air Quality

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Beneficial/Adverse/ Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Beneficial/Adverse/ Negligible)
				I	UK	E	R	C	B	L	
Construction											
Dust and particulate matter generated during the construction phase	Temporary	-	The adoption of best practice mitigation measures as recommended by the IAQM guidance and set out above to be included in a DMP to be secured by a planning condition.							*	Negligible
Impacts on Local Air Quality from emissions from construction traffic	Temporary	In accordance with the Medway Council Guidance the impact is Low / Imperceptible Adverse. In accordance with the EPUK & IAQM Guidance the impact is Negligible.	None required							*	In accordance with the Medway Council Guidance the impact is Low / Imperceptible Adverse. In accordance with the EPUK & IAQM Guidance the impact is Negligible.
Completed Development											
Impacts on Local Air Quality from emissions from road traffic generated by the operation of the Development and possible EfW plant	Permanent	In accordance with the Medway Council Guidance the impact is Medium Adverse at some roadside receptors and Low/imperceptible Adverse at receptors affected only by the possible EfW plant. In accordance with the EPUK & IAQM Guidance the impact at all receptors is Negligible. Insignificant impacts at ecological receptors.	Mitigation measures are proposed to reduce impact of traffic related emissions. These include the provision of electric vehicle charging points; promotion of a car sharing scheme; provision of a car club, bus service, cycle parking and cycle routes.							*	In accordance with the Medway Council Guidance the impact is Medium Adverse at some roadside receptors and Low / Imperceptible Adverse at receptors affected only by the possible EfW plant. In accordance with the EPUK & IAQM Guidance the impact at all receptors is Negligible. Insignificant impacts at ecological receptors.

Cumulative Effects											
Construction											
Combined impact of dust and particulate matter generated during the construction phase of the Site and nearby committed developments	Temporary	-	The adoption of best practice mitigation measures as recommended by the IAQM guidance and set out above							*	Negligible
Operation											
Combined impacts on local air quality from road traffic and plant from the Development and nearby committed development	Permanent	In accordance with the Medway Council Guidance, the impact is Medium Adverse at some roadside receptors and Low/Imperceptible Adverse at receptors affected only by the possible EfW plant. In accordance with the EPUK & IAQM Guidance the impact is negligible. Insignificant impacts at ecological receptors.	Mitigation measures are proposed to reduce impact of traffic related emissions							*	In accordance with the Medway Council Guidance, the impact is Medium Adverse at some roadside receptors and Low/Imperceptible Adverse at receptors affected only by the possible EfW plant. In accordance with the EPUK & IAQM Guidance the impact is negligible. Insignificant impacts at ecological receptors.

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

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