NORTH LONDON WASTE AUTHORITY

NORTH LONDON HEAT AND POWER PROJECT

ENVIRONMENTAL STATEMENT: VOLUME 2 APPENDICES 2.1 TO 2.3

AD06.02

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NORTH LONDON HEAT AND POWER PROJECT

ENVIRONMENTAL STATEMENT: VOLUME 2 APPENDIX 2.1 AIR QUALITY AND ODOUR ASSESSMENT METHODOLOGY

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Environmental Statement Volume 2 Appendix 2.1 Air Quality and Odour Assessment Methodology

AD06.02

The Planning Act 2008 The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5 (2)(a)

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1 Air Quality and Odour Assessment Methodology

1.1 Introduction

1.1.1 This appendix sets out the methodology for assessing the likely significant effects of the Project on air quality and odour during the construction, operation and decommissioning stages of the Project.

1.1.2 Air quality studies are concerned with the presence of airborne pollutants in the atmosphere. This air quality assessment looks at potential emissions of dust, gases, particulates, heavy metals and odour, during the Project development stages. Emissions of these pollutants are associated with construction activities, as well as emissions generated by traffic associated with the Project, fugitive emissions[1] and emissions from the operation of the existing energy from waste (EfW) facility and proposed energy recovery facility (ERF).

1.1.3 In addition the air quality assessment considers the consequences for human health of exposure to emissions to atmosphere from the ERF.

1.1.4 This section is divided into the following parts:

a. engagement – describing a summary of comments included in the Scoping Opinion and received on the Preliminary Environmental Information Report (PEIR), confirming how these comments have been addressed;

b. legislation and guidance – detailing requirements of the relevant National Policy Statements (NPS), how these have been addressed and additional guidance relevant to the assessment;

c. methodology for establishing baseline conditions; and

d. methodology for the assessment of construction, operation, decommissioning and cumulative effects.

1.2 Engagement

1.2.1 As part of the EIA process, engagement is being undertaken with various statutory and non-statutory authorities.

1.2.2 For air quality and odour, stakeholders include the Secretary of State, the Environment Agency (EA) and local authority environmental health departments, with whom the scope and methodology of the assessment has been discussed and agreed.

1.2.3 Vol 2 Appendix 2.1 Table 1 sets out comments made by air quality stakeholders and a response is provided to each of the comments identifying how the comments have been addressed in the ES (AD06.02).

[1] Fugitive emissions are uncontrolled releases of gases or dust to the atmosphere, for example wind blow dust from stock piles or surface dust or leaks.

Vol 2 Appendix 2.1 Table 1: Air quality and odour engagement – comments and responses

No.	Organisation and date	Comment	Response
1	Scoping response: Secretary of State (November 2014)	*"The Secretary of State welcomes the proposed approach to undertaking a complete assessment of the potential effects of the proposed development on air quality."* (Paragraph 3.18)	Noted.
2		*"Section 5.2 of the Scoping Report summarises the outcomes of the baseline assessment work undertaken in 2013. The applicant is encouraged to discuss the adequacy of the data with relevant consultees to ensure it is robust and representative of the baseline conditions particularly when demolition/construction is likely to commence in 2019."* (Paragraph 3.19)	As part of the engagement with London Borough of (LB) Enfield, LB Waltham Forest and LB Haringey to discuss the scope of the air quality and odour assessment, it was advised that a baseline assessment was being undertaken with an invitation to discuss in more detail if required. Responses were received from the local authorities and no queries were raised. Baseline data for future years has also been considered within this assessment and worst-case assumptions made regarding future background pollutant concentrations.
3		*"The assessment should address potential impacts from increases in airborne pollution including fugitive dust during site preparation, construction and dismantling works, from construction and operational traffic as well as emissions from the stack. The impact of these emissions both on site and off site should be assessed, including along access roads, local footpaths and other PRoW [Public Rights of Way]. The need for appropriate mitigation and monitoring measures should also be considered and to this end the Secretary of State encourages the applicant to agree these with relevant consultees"* (Paragraph 3.21)	Noted – this is consistent with the assessment approach. Mitigation and monitoring would be carried out for construction, as outlined in the Code of Construction Practice (CoCP) (see Vol 1 Appendix 3.1).
4		*"The Secretary of State notes from Paragraph 3.2.5 of the Scoping Report that the existing facility would continue to operate during construction and that it would continue to manage the same levels of throughput as at present. This together with the fact that there would be a phased move from the existing to the new facility indicates that there could be a scenario when both the existing and proposed plants are operating. The ES should describe*	Potential worst-case scenarios have already been discussed with the EA. The transition stage (Stage 2) has been taken into account in the air quality modelling to ensure maximum pollution concentrations are considered, the results of

No.	Organisation and date	Comment	Response
		and assess the potential worst-case impacts that could occur during such a scenario. This applies to each topic assessment in the ES." (Paragraph 3.22)	which are reported in Vol 2 Section 2.
5		*"The implications of stack height and dispersion on the discharge of emissions need to be clearly explained in the ES, alongside a justification of the modelled parameters. The Secretary of State recommends that dispersion modelling considers a range of possibilities and seeks to ensure that the 'worst-case' scenario is assessed (even if this is only a short-term impact)."* (Paragraph 3.23)	Model parameters are set out in Vol 2 Section 2. Worst-case assumptions have been made throughout the assessment as reported.
6		*"Paragraph 5.3.3 of the Scoping Report states emissions from the proposed development could affect an area 10km in radius away from the site. It is therefore not clear why the potential for significant cumulative effects is limited to 600m from the site (as described in Section 4.3 of the Scoping Report). The Secretary of State considers that the methodology for assessing potential cumulative air quality impacts should be clearly explained and where possible agreed with relevant consultees"* (Paragraph 3.24)	The cumulative effects assessment area for Air Quality and Odour is the same as the assessment area for the core assessment which is 10km from the Application Site.
7	Scoping response: Secretary of State, Environment Agency (November 2014)	*"Paragraph 5.3.7 states that the assessment of construction impacts on air quality will be based on the 2014 IAQM [Institute of Air Quality Management] 'Guidance on the assessment of dust from demolition and construction'. The Secretary of State recommends that the assessment should be based on the most up to date and relevant guidance and notes that the Environment Agency recommends more recent guidance from the Greater London Authority which should be followed."* (Paragraph 3.25) Environment Agency – "*The applicant should be aware that the more recent GLA guidance probably represents a newer standard of best practice that we recommend they follow rather than the IAQM*." (Appendix 2)	The most up to date version of the Greater London Authority (GLA) guidance[2] (and other relevant guidance) is used in the assessment of construction impacts on air quality.
8		*"The Secretary of State welcomes the assessment of potential plume visibility from stack emissions and expects clear cross referencing within the ES to the townscape and visual impact assessment. The ES should explain clearly the likely frequency and size of the potential visible plume."* (Paragraph 3.26)	Details of the frequency and size of the plume are contained within Vol 2 Section 2 (Air Quality and Odour) and Vol 3 (Visual).
9	Scoping response: Secretary of	*"Consideration should be given to appropriate mitigation measures and to monitoring of dust and odour complaints during construction and*	Vol 2 Section 2 provides details of the mitigation measures proposed within

[2] Greater London Authority (2014) The Control of Dust and Emissions during Construction and Demolition: Supplementary Planning Guidance, July 2014.

No.	Organisation and date	Comment	Response
	State (November 2014)	*operation, particularly given the proximity of residential receptors."* (Paragraph 3.27)	the CoCP (see Vol 1 Appendix 3.1) which includes proposals for the monitoring of dust. Additionally, written schemes for the management and mitigation of odour and dust emissions during operation will be prepared, submitted to and approved by the relevant planning authority prior to operation of the Project.
10		"*Consideration should be given to appropriate mitigation measures and to monitoring of dust and odour complaints during construction and operation, particularly given the proximity of residential receptors."* (Paragraph 3.28)	As above.
11	Scoping response: NHS (November 2014)	"*We assume that the air filtering on the stacks will be compliant with all legislation and will be the best that can be provided to ensure clean air for the surrounding areas, and more widely"* (Appendix 2)	A permit to operate the plant (with appropriate emission limits) will be applied for from the EA who would need to be satisfied that the air quality impacts are acceptable. Discussions with the EA are taking place with the permit application expected to be made in Autumn 2015.
12	Scoping response: Greater London Authority (January 2015)[3]	The EIA Scoping Report provides details of the air quality assessment and appears to be comprehensive. GLA officers will able to comment in more detail when the Environmental Statement has been prepared.	Noted.
13		The applicant will be required to undertake noise and air quality assessment work to demonstrate the proposal is acceptable in strategy terms. The applicant should ensure is the requirements of the London Plan policy fully addressed to ensure that environmental impacts are mitigated.	The EIA takes into consideration all relevant policy primarily the NPS'. Local policy is considered within topic assessments where appropriate.
14	Environment Agency (various dates)	Technology to minimise oxides of nitrogen (NOx) emissions is preferred. Confirmed agreement with proposed methodology and scope.	Assessment of impacts and stack height is based on a worst-case assessment using emission limits that are being agreed with the EA

[3] http://infrastructure.planningportal.gov.uk/wp-content/ipc/uploads/projects/EN010071/1.%20Pre-Submission/EIA/Scoping/Late%20Response/Late%20responses%20to%20EIA%20scoping%20consultation.pdf (accessed March 2015)

No.	Organisation and date	Comment	Response
			and will form part of the permit. All model files and calculations will be sent to the EA for review.
15	LB Enfield (March 2015)	Confirmed agreement with proposed methodology and scope.	Noted.
16	LB Haringey (March 2015)	Confirmed agreement with proposed methodology and scope, and discussed the use of GLA guidance and requested an Air Quality Neutral assessment[4].	Noted. An Air Quality Neutral assessment is not required for this type of industrial process. The GLA guidance specifically states that this is not required for an industrial process regulated by the EA[5].
17	LB Waltham Forest (March 2015)	Confirmed agreement with proposed methodology and scope	Noted
18	Phase 2 consultation response: LB Enfield (June 2015)	The methods proposed for the assessment are acceptable. Suggest that construction/demolition dust impact is considered using the GLA supplementary planning guidance 'The Control of Dust and Emissions During Construction and Demolition'.	The method outlined in the GLA guidance is the same as that in the IAQM guidance, and so it is considered that the same approach has been followed. Both guidance documents are referenced in the assessment. Where any additional mitigation is recommended, this is included in the CoCP (see Vol 1 Appendix 3.1).
19	Phase 2 consultation response: GLA (June 2015)	Noise and air quality assessment work is required to demonstrate the proposal is acceptable in strategic policy terms. It should be ensured that the requirements of London Plan policy 5.17 and in particular 5.17e/f and D are fully addressed to ensure that environmental impacts are mitigated.	The air quality assessment takes into consideration all relevant policies.
20		Guidance relating to non-road mobile machinery (NRMM) contained within the Control of Dust and Emissions During Construction and Demolition SPG should be referred to.	Relevant requirements are included in the CoCP (see Vol 1 Appendix 3.1) which includes the measures on NRMM contained in the SPG.

[4] Air Quality Neutral is a supplementary planning guidance prepared by the GLA; it is aimed as assessing developments emissions and comparing them to either existing emissions or relevant emission benchmarks to ensure new developments will improve air quality.
[5] GLA (2014) Sustainable Design and Construction Supplementary Planning Guidance, paragraph 4.3.4, footnote 87.

No.	Organisation and date	Comment	Response
21		Suggests that odour modelling should be carried out.	A qualitative odour assessment has been carried out, which concluded that that there would be no change or an expected improvement in odour, predominantly from the removal of the existing IVC, and that the predicted impact of the ERF and RRF would be low. Therefore further assessment (modelling) is not considered to be required.
22		Suggests that as the Application Site is within an AQMA a threshold of 5 per cent (500) on roads with an AADT of over 10,000 should be used.	These criteria are likely taken from the previous Environmental Protection UK (EPUK) guidance, which has been revised since the submission of the PEIR. The new 2015 guidance[6] has been followed, which has more stringent assessment criteria.
23	Phase 2 Consultation response: Secretary of State (June 2015)	The Planning Inspectorate considers that the cooling systems associated with the ERF have the potential to emit pollutants to air which needs to be assessed.	Cooling towers do not emit any harmful pollutants and therefore no assessment is required with regard to air quality.

1.3 Legislation, policy and guidance

1.3.1 This section identifies national and local legislation, policy and guidance of particular relevance to air quality that have informed the methodology for the assessment of air quality and odour effects of the Project.

National air quality policy

Nationally Significant Infrastructure Projects

1.3.2 Planning policy for Nationally Significant Infrastructure Projects, is contained in the NPS'.

1.3.3 There are two NPS' of direct relevance to the Project. These are:

a. EN-1 – Overarching NPS for Energy;

b. EN-3 – NPS for Renewable Energy Infrastructure.

[6] Moorcroft and Barrowcliffe. et al, (2015) Land-Use Planning & Development Control: Planning for Air Quality, Insititute of Air Quality Management, London

1.3.4 Vol 2 Appendix 2.1 Table 2 details the requirements from EN-1 which are relevant to air quality and odour. How this requirement has been addressed and where further details on how the requirement has been addressed is also described.

Vol 2 Appendix 2.1 Table 2: Air quality NPS EN-1 requirements

Requirements of NPS EN-1	**How the requirement is addressed**	**Location of where to find further detail**
Paragraph 5.2.4 – *'Design of exhaust stacks, particularly height, is the primary driver for the delivery of optimal dispersion of emissions and is often determined by statutory requirements. The optimal stack height is often determined by terrain and meteorological conditions, in combination with the emission characteristics of the plant. The EA will require the exhaust stack height of a thermal combustion generating plant, including fossil fuel generating stations and waste or biomass plant, to be optimised in relation to impact on air quality. The IPC [Infrastructure Planning Commission] need not, therefore, be concerned with the exhaust stack height optimisation process in relation to air emissions, though the impact of stack height on landscape and visual amenity will be a consideration.'*	The EA has been involved in the design process to ensure development consent is sought on a design which will meet the air quality Emission Limit Values (ELVs) as required for the EA permit. The air quality modelling files and modelling parameters will be provided to the EA for the permit application. Assessment of stack height has already been undertaken and results discussed with the EA.	Details of the stack parameters including height can be found in Vol 2 Appendix 2.1 Table 21.
Paragraph 5.2.6 – *'Where the project is likely to have adverse effects on air quality the applicant should undertake and assessment of the impacts of the proposed project as part of the Environmental Statement.*	Air quality assessment included in the scope of the EIA.	Vol 2 Section 2 (Air Quality and Odour)
Paragraph 5.2.7 of this NPS notes that the applicant should include the following in the air quality assessment.		
'any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated project;'	The air quality assessment takes account of all significant sources of air emissions from the Application Site, assessment of the various stages of the Project has been undertaken and traffic generated by the Project has been assessed. Mitigation is embedded into the Project design to avoid significant effects.	Vol 2 Section 2 (Air Quality and Odour)
'the predicted absolute emission levels of the proposed project, after mitigation methods have been applied;'	Emission levels at sensitive receptor locations and across the local area have been predicted. The results taking account of embedded mitigation are included in the assessment.	Vol 2 Section 2.6 sets out embedded mitigation within the Project. Vol 2 Section 2.8 provides the modelled assessment results.
'existing air quality and the relative change in air quality from existing levels;'	Details of the baseline (existing) air quality concentrations are included in the assessment	Baseline concentrations are provided in Vol 2

Requirements of NPS EN-1	How the requirement is addressed	Location of where to find further detail
	along with the relative change in air quality concentrations as a result of the Project.	Section 2.5. Modelling results showing change in concentrations compared to the existing air pollution levels are provided in Vol 2 Section 2.8.
'any potential eutrophication impacts.'	Assessment of the impact upon sensitive ecosystems has been included.	Details of impacts on ecological sites is included in Vol 2 Section 2.8.
Paragraph 5.2.8 notes that 'many activities involving air emissions are subject to pollution control.' The considerations set out in Section 4.10 of this NPS and detailed below on the interface between planning and pollution control therefore apply, and should be considered.		
Paragraph 4.10.2 – *' Pollution control is concerned with preventing pollution through the use of measures to prohibit or limit the releases of substances to the environments from different sources to the lowest practicable levels. It also ensures that ambient air meet standards that guard against impacts to the environment or human health.'*	Noted.	Details of results showing comparison to objectives and standards designed to protect human health is found in Vol 2 Section 2.8.
Paragraph 4.10.6 – *'Applicants are advised to make early contact with relevant regulators including the EA, to discuss their requirements for environmental permits and other consents. This will help ensure count of all relevant environmental considerations and that the relevant regulators are able to provide timely advice and assurance to the IPC. Whenever possible, applicants are encouraged to submit applications for Environmental Permits and other necessary consents at the same time as applying to the IPC for development consent.'*	Contact with the EA has been ongoing through the development consent and permitting process.	It is the Authority's intention to submit a permit in Autumn 2015.
Paragraph 4.10.8 – '*The relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework; the effects of existing sources of pollution in and around the site are not such that the cumulative effects of pollution when the proposed development is added would make that development unacceptable, particularly in relation to statutory environmental limits.*	Engagement has been undertaken with the EA from an early stage in the Project during which preliminary modelling studies were shared. This engagement will continue and the EA will review the modelling undertaken as part of the permit application. All statutory limits have been taken into account within this assessment and cumulative effects of the development and others in the area have been taken into account.	Details of the cumulative effects assessment are included in Vol 2 Section 2.12.
Paragraph 5.2.9 – *Air quality considerations may be given substantial weight where 'a project would lead to a deterioration in air quality in an area, or leads to a new areas*	Noted. Results of this assessment are provided both in terms of comparison to the	Assessment results showing both comparison to standards and total increases are provided in

Requirements of NPS EN-1	How the requirement is addressed	Location of where to find further detail
where air quality breaches national air quality limits. However air quality considerations will also be important where substantial changes in air quality levels are expected, even if this does not lead to any breaches of national air quality limits.'	standards and total increases.	Vol 2 Section 2.8.
Paragraph 5.2,10 – *'Where a project is likely to breach any relevant statutory air quality limit, the developer should work with the relevant authorities to secure appropriate mitigation measures to allow the proposal to proceed.'*	No exceedences of objectives are predicted as a result of the Project. Details of embedded for the construction and demolition works are included in the assessment.	Details of embedded mitigation measures are provided in Vol 2 Section 2.6.
Paragraph 5.2.11 – *It should be considered 'whether mitigation measures are needed both for operational and construction emissions over and above any which may for part of the project application. A construction management plan may help codify mitigation at this stage.'*	Assessment of the construction and demolition works has been undertaken. Embedded mitigation measures (specified in the CoCP) have been taken into account in the assessed level of risk.	Embedded mitigation measures are described in Vol 2 Section 2.6 and the CoCP is contained in Vol 1 Appendix 3.1.
Paragraph 5.2.12 – *In consideration of mitigation measures detailed in 5.2.11, the conditions and advice in the Air Quality Strategy or any successor to it may be referred to.*	Noted	Embedded mitigation measures are described in Vol 2 Section 2.6 and the CoCP is contained in Vol 1 Appendix 3.1.

1.3.5 Vol 2 Appendix 2.1 Table 3 details the requirements from EN-3 which are relevant to air quality and odour. How this requirement has been addressed and where further details on how the requirement has been addressed is also described.

Vol 2 Appendix 2.1 Table 3: Air quality NPS EN-3 requirements

Requirements of NPS EN-1	How the requirement is addressed	Location of where to find further detail
Paragraph 2.5.39 – 'In addition to the air quality legislation referred to in EN-1 the Waste Incineration Directive (WID) is also relevant to waste combustion plant. It sets out specific emissions limit values for waste combustion plants.'	The ELVs appropriate for this development have been used to determine worst-case process emissions.	Details of the ELVs used are found in Vol 2 Appendix 2.1 Table 5 and the process emissions used based on these are detailed in Vol 2 Appendix 2.1 Table 21.
Paragraph 2.5.40 – 'The applicant's EIA should include an assessment of the air emissions resulting from the proposed infrastructure and demonstrate compliance with the relevant regulations.'	Requirement of all relevant regulations has been taken into account in the air quality assessment. No exceedences of objectives are predicted as a result of the Project.	Results showing the comparison with the relevant regulations for each pollutant is shown in Vol 2 Section 2.8 along with an assessment of the significance.
Paragraph 2.5.41 – 'Compliance with the WID and the Large Combustion Plant Directive is enforced through the environmental permitting regime	The EA has been engaged through the design process to	No further details.

Requirements of NPS EN-1	How the requirement is addressed	Location of where to find further detail
regulated by the EA. Plants not meeting the requirements of the WID and/or Large Combustion Plant Directive would not be granted permission to operate.'	ensure that development consent is sought on a design which will meet the air quality ELVs as required for the EA permit.	
Paragraph 2.5.42 – The pollutants of concern arising from the combustion of waste and biomass include NO_x, SO_x, particulates and CO_2. In addition remissions of heavy metals, dioxins and furans are a consideration for waste combustion generating stations but limited by the WID and regulated by the EIA.'	All pollutants of concern from the combustion of waste are considered within the air quality assessment.	The full list of pollutants along with the assessment criteria for each are detailed within Vol 2 Section 1.3.
Paragraph 2.5.45 – Abatement technologies should be those set out in the relevant sector guidance as produced by the EA.'	Abatement technologies as set out in the relevant sector guidance have been included in the Project.	Vol 1 Section 3 sets out the proposed technologies for the ERF.

The National Planning Policy Framework

1.3.6 The National Planning Policy Framework (NPPF) (March 2012)[7] was published with the purpose of planning to achieve sustainable development. Paragraph 120 of the NPPF relates to pollution (air quality and odour), and states that:

> *"To prevent unacceptable risks from pollution, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account."*

1.3.7 In addition, Paragraph 124 of the NPPF on air quality states that:

> *"Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas [AQMAs] and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."*

1.3.8 This is relevant as the Project is located within the borough wide LB Enfield AQMA and therefore any planning decisions will need to consider the developments impact upon air quality concentrations. This assessment provides the information to enable the decision.

[7] Department for Communities and Local Government (2012) National Planning Policy Framework.

Planning Practice Guidance (2014)

1.3.9 As part of the NPPF, planning practice guidance on various topics was recently published[8]. In relation to air quality, the guidance refers to the significance of air quality assessments to determine the impacts of proposed developments in the area and describes the role of local and neighbourhood plans with regard to air quality. It also provides a flowchart method to assist local authorities determine how considerations of air quality fit into the development management process. The guidance has been considered in the preparation of the air quality assessment.

Local air quality policy

1.3.10 The London Plan, consolidated with alterations, 2015[9] forms part of the development strategy for the Greater London area until 2031 and integrates all economic, environmental, transport and social frameworks. This has been amended to be consistent with the NPPF.

1.3.11 Specifically for new development proposals, the London Plan, consolidated with alterations, 2015, tackles the issue of air quality by proposing the following measures:

a. minimise increased exposure to existing poor air quality and make provision to address local problems of air quality such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans;

b. promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils' 'The control of dust and emissions from construction and demolition';

c. be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as AQMAs);

d. ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site; and

e. where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations.

1.3.12 The document also outlines that boroughs should have policies that:

a. seek reductions in levels of pollutants referred to in the Government's National Air Quality Strategy having regard to the Mayor's Air Quality Strategy; and

b. take account of the findings of their Air Quality Review and Assessments and Action Plans, in particular where Air Quality Management Areas have been Designated.

1.3.13 These measures and policies have been considered in the undertaking of this air quality assessment where relevant. Consideration of air quality

[8] Department for Communities and Local Government (2014) Planning Practice Guidance: Air Quality
[9] Greater London Authority (2015); The London Plan: The Spatial Development Strategy for London Consolidated With Alterations Since 2011

policies is taken into account when determining the overall significance of the project effects. All relevant policies above are considered to ensure the scheme meets the local requirements.

Air quality legislation

European Air Quality Management

1.3.14 In 1996 the European Commission published the Air Quality Framework Directive on ambient air quality assessment and management (96/62/EC)[10]. This Directive defined the policy framework for 12 air pollutants known to have harmful effects on human health and the environment. Limit values (pollutant concentrations not to be exceeded by a certain date) for each specified pollutant are set through a series of Daughter Directives, including Directive 1999/30/EC (the 1st Daughter Directive)[11] which sets limit values for sulphur dioxide (SO_2), nitrogen dioxide (NO_2) and NO_x, particulate matter (PM_{10}) and lead (Pb) in ambient air.

1.3.15 In May 2008 the Directive 2008/50/EC[12] on ambient air quality and cleaner air for Europe came into force. This Directive consolidates the above (apart from the 4th Daughter Directive, which will be brought within the new Directive at a later date), provides a new regulatory framework for very fine particulate matter ($PM_{2.5)}$ and makes provision for extended compliance deadlines for NO_2 and PM_{10}.

1.3.16 The Directives were transposed into legislation in England by the Air Quality Standards Regulations 2010[13]. The Secretary of State for the Environment has the duty of ensuring the air quality limit values are complied with. The limit values are taken into consideration within this assessment.

Environment Act 1995

1.3.17 Part IV of the Environment Act 1995[14] 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 Air Quality Strategy for England, Scotland, Wales and Northern Ireland[15] 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. This includes the statutory duty, also under Part IV of the Environment Act 1995, for local authorities to undergo a process of local air quality management.

[10] Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management.
[11] Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air.
[12] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.
[13] 2010 No.100, Environmental Protection, The Air Quality Standards Regulations 2010, 11 June 2010.
[14] Environment Act 1995, 1995 Chapter 25, Part IV Air Quality.
[15] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Volume 1, July 2007.

Air Quality objectives and limit values

1.3.18 Air quality limit values and objectives are quality standards for clean air. They can be used as assessment criteria for determining the significance of any potential changes in local air quality resulting from a development proposal.

1.3.19 Some pollutants have standards expressed as annual average concentrations due to the chronic way in which they affect health or the natural environment (i.e. effects occur after a prolonged period of exposure to elevated concentrations) and others have standards expressed as 24-hour, one-hour or 15-minute average concentrations due to the acute way in which they affect health or the natural environment (i.e. after a relatively short period of exposure). Some pollutants have standards expressed in terms of both long-term and short-term concentrations. Vol 2 Appendix 2.1 Table 4 sets out these EU air quality limit values and national air quality objectives for the pollutants relevant to this study.

1.3.20 In the majority of cases the air quality limit values and air quality objectives have the same pollutant concentration threshold and date for compliance. The key difference is that the Secretary of State for the Environment is required under European Law to ensure the air quality limit values are complied with whereas local authorities are only obliged under national legislation to undertake best efforts to comply with the air quality objectives. To assist local authorities in demonstrating best efforts, the Environment Act 1995 requires that when carrying out their local air quality management functions, local authorities shall have regard to guidance issued by the Secretary of State.

1.3.21 The standards apply at human and ecological receptor locations. The standards apply at human receptor locations where people will be exposed to a pollutant for a period relevant to the standard such as at residential locations, hospitals and schools. Ecological receptors are assessed against relevant pollutants (NO_x, NO_2, SO_2 and Ammonia (NH_3)) at sensitive ecological sites.

1.3.22 The limit values and objectives have been used to assess the impact of the proposed ERF.

Vol 2 Appendix 2.1 Table 4: Air quality standards

Pollutant	Averaging period	Limit value / objective
NO_2	1-hour mean	200µg/m^3 not to be exceeded more than 18 times a year (99.8th percentile)
	Annual mean	40µg/m^3
NO_x	Annual mean	30µg/m^3 (for the protection of vegetation and ecosystems)
CO	Maximum daily	10mg/m^3

Pollutant	Averaging period	Limit value / objective
	running 8-hour mean	
Volatile Organic Compounds (VOCs): Benzene (C_6H_6)	Annual mean	5µg/m^3
SO_2	15-minute mean	266µg/m^3 not to be exceeded more than 35 times a year
	1-hour mean	350µg/m^3 not to be exceeded more than 24 times a year
	24-hour mean	125µg/m^3 not to be exceeded more than 3 times a year
	Annual mean	20µg/m^3 (for the protection of vegetation and ecosystems)
PM_{10}	24-hour mean	50µg/m^3 not to be exceeded more than 35 times a year (90.4th percentile)
	Annual mean	40µg/m^3
$PM_{2.5}$	Annual mean	25µg/m^3
	Target value	15 per cent reduction of existing background levels
PAH: Benzo(a)pyrene	Annual mean	0.25ng/m^3
		1ng/m^3
Pb	Annual mean	0.25µg/m^3
	Annual mean	0.5µg/m^3
As	Annual mean	6ng/m^3
Cd	Annual mean	5ng/m^3
Ni	Annual mean	20ng/m^3

Industrial Emissions Directive

1.3.23 The Industrial Emissions Directive (IED) (2010/75 /EU)[16], brought seven separate directives including the WID into a single directive. The IED was transposed into national legislation by the Environmental Permitting (England and Wales) (Amendment) Regulations 2013. The legislation contains the ELVs applicable to the proposed ERF as set out in Vol 2 Appendix 2.1 Table 5. The ERF must comply with the ELVs as set in the directive, the EA are responsible for permitting operations that need to comply with the ELVs. The ELVs are considered within the modelling assessment to ensure that a worst-case modelling scenario is considered. This is a worst-case assessment as the ELVs are the maximum

[16] Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control).

concentrations the development can emit. In reality the emissions would be below the ELVs.

1.3.24 It is the Applicant's intention that an application to the EA for a permit to operate will be made in Autumn 2015. This allows the EA to fully engage on the ERF technology to ensure permission is granted for a plant design that is compatible with the IED requirements.

Vol 2 Appendix 2.1 Table 5: Industrial Emission Directive ELVs (mg/ Nm^3) [(a)]

Substance	Daily mean	30 minute mean	
		100th percentile	97th percentile
Particles	10	30	10
NO_2	200	400	200
SO_2	50	200	50
CO	50	100 [(b)]	150 [(c)]
Hydrogen fluoride (HF)	1	4	2
Hydrogen chloride (HCl)	10	60	10
Total Organic Carbon (TOC)	10	20	10
Group I metals - Cd and Ti [(d)]	0.05		
Group II metals - Hg [(d)]	0.05		
Group III metals - Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V [(d)]	0.5		
Dioxins and Furans [(e)]	0.1 ng I-TEQ m^3		

(a) Units are in Nm^3 (273K, dry and 11 per cent O_2) unless otherwise stated
(b) 100th percentile of half hourly average concentrations in any 24 hour period
(c) 95th percentile of tem minute average CO concentration
(d) Average over a sample period between 30 minutes and 8 hours
(e) Average over a sampling period of 6 to 8 hours

Ecological legislation

1.3.25 European Council Directive 92/43/EEC[17] (Habitats Directive) requires member states to introduce a range of measures for the protection of habitats and species. The Conservation of Habitats and Species Regulations 2010[18] transposes the Directive into law in England and Wales.

1.3.26 The Habitats Directive requires the competent authority, which in this case would be the Secretary of State, to firstly evaluate whether the Project is likely to give rise to a significant effect on the European site (Habitats Regulation Assessment screening). Where this is the case, it has to carry out an 'appropriate assessment' in order to determine whether the Project would adversely affect the integrity of the European site.

1.3.27 There are specific objective pollutant concentrations for vegetation called 'critical levels', which are shown in Vol 2 Appendix 2.1 Table 6. These are concentrations below which harmful effects are unlikely to occur.

[17] European Council Directive (92/43/EEC) of 21 May 1992, on the conservation of natural habitats and of wild fauna and flora
[18] UK The Conservation of Habitats and Species Regulations (2010) No. 490

1.3.28 The limit value applies to locations more than 20km from towns with more than 250,000 inhabitants or more than 5km from other built-up areas, industrial installations or motorways.

1.3.29 However, the EA's H1 guidance states that "*the critical levels should be applied at all locations as a matter of policy, as they represent a standard against which to judge ecological harm*".

1.3.30 The objectives within the legislation are used to assess the potential impacts upon any sensitive ecosystems.

Vol 2 Appendix 2.1 Table 6: Critical levels for the protection of ecosystems

Pollutant	Time period	Objective
Nitrogen oxides (expressed as NO_2)	Annual mean (objective)	30µg/m^3
	Daily mean (guideline)	75µg/m^3
SO_2	Annual mean (guideline)	20µg/m^3
Ammonia (NH_3) critical level for ecosystems dominated by lichens and bryophytes	Annual mean (guideline)	1µg/m^3
Ammonia (NH_3) critical level for all other ecosystems	Annual mean (guideline)	3µg/m^3

Plume visibility

1.3.31 Water in the emitted gases can condense and form a visible plume. The acid gas removal options result in some differences in moisture content in the emitted gases. The EA can be concerned about the visible plume length so a comparison has been made for both options. There are no formal or informal standards for visible plume lengths although visible plumes that reach ground level should be avoided. It can be expected that the EA would seek to reduce the frequency of visible plumes but as this can be at the expense of increase energy usage, a balance has to be made between visible plume length and energy use.

Odour

1.3.32 Odour is a single or a mix of volatile chemical compounds that trigger a reaction in the olfactory organ at very low concentrations. Any odour, whether pleasant or unpleasant, can result in a loss of amenity for nearby residents. If the odour is perceived for a sufficiently frequent time above a threshold level, then it can give rise to statutory nuisance. Odour can therefore be an important issue in planning, when proposals are submitted for potentially odorous developments located near sensitive receptors and vice versa.

1.3.33 There is no statutory limit in England and Wales for ambient odour concentrations, for either single or a mix of compounds.

Air quality and odour guidance

Environment Agency H1 guidance

1.3.34 Annex F of the EA H1 Guidance[19] document provides advice on assessing the impact of releases to air from listed activities. The guidance is part of the EA horizontal guidance for all sectors regulated under the Environmental Permitting Regulations.

1.3.35 The guidance takes a risk based approach for actions which may have an effect on the environment. For air quality this involves screening the emissions from the activity against the criteria set out in the guidance.

1.3.36 The guidance states that process contributions to air can be considered insignificant if:

a. the long-term (annual mean) process contribution is <1 per cent of the long-term environmental standard; and

b. the short-term (hourly mean) process contribution is <10 per cent of the short-term environmental standard.

1.3.37 Where emissions exceed these criteria detailed modelling is recommended.

1.3.38 The assessment has been prepared in accordance with this guidance, and the process contribution from the ERF compared with the environmental standard as above.

EPUK/IAQM Land-Use Planning and Development Control (2015)

1.3.39 The 2015 Land-Use Planning and Development Control guidance document[6] produced by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) provides a framework for professionals operating within the planning system to provide a means of reaching sound decisions, having regard to the air quality implications of development proposals.

1.3.40 The document provides guidance on when air quality assessments are required by providing screening criteria regarding the size of a development, changes to traffic flows/composition energy facilities or combustion processes associated with the development.

Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction (2014)

1.3.41 The IAQM guidance[20] was produced in consultation with industry specialists and the GLA and gives guidance to development consultants and environmental health officers on how to assess air quality impacts from construction. The IAQM guidance provides a method for classifying the significance of effect from construction activities based on the 'dust magnitude' (high, medium or low) and proximity of the Application Site to the closest receptors. The guidance recommends that once the significance of effect from construction is identified, the appropriate mitigation measures are implemented. Experience has shown that once

[19] Environment Agency (2011) H1 Annex F – Air Emissions.
[20] IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction.

the appropriate mitigation measures are applied in most cases the resulting dust impacts can be reduced to negligible levels. The IAQM guidance methodology has been followed in this assessment and provides the basis for the determination of significance for the construction dust assessment.

The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance (2014)

1.3.42 The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance (SPG) was published in July 2014 by the GLA[2]. The SPG seeks to reduce emissions of dust and PM_{10} from construction and demolition activities in London as well as managing emissions from construction and demolition machinery by means of a new non-road mobile machinery ultra-low emissions zone. The SPG also sets out mitigation measures and policies to limit the local air quality effects of demolition and construction these are derived from those outlined in the IAQM guidance. The GLA guidance is based on that produced by the IAQM and the same dust assessment methodology is used in the assessment. This methodology has therefore been followed in the assessment and as with the IAQM guidance[20] provides the basis for the determination of significance for the construction dust assessment.

Odour

1.3.43 As stated in Paragraphs 1.3.32-1.3.33 above, there is no statutory limit in England and Wales for ambient odour concentrations, for either single or a mix of compounds. However, the EA suggests guidance limits and there are some custom-and-practice standards that have been used in some circumstances to advise on planning decisions and court rulings.

Environment Agency H4 guidance

1.3.44 The EA's H4 guidance[21] sets a range of odour criteria that "indicate the likelihood of unacceptable odour pollution". These criteria depend on the relative offensiveness of the odour and are based on the 98th percentile of hourly mean odour concentrations[22]. The guidance also sets benchmark levels to assess the offensiveness of odours at the boundary of the Application Site:

a. $1.5ou_E/m^3$ for most offensive odours (e.g. processes involving decaying animal remains);

b. $3ou_E/m^3$ for moderately offensive odours (e.g. fat frying); and

c. $6ou_E/m^3$ for less offensive odours (e.g. baking).

1.3.45 This guidance is applicable to the processes under the Environmental Protection Regulations as a permit is required for planning purposes. The

[21] Environment Agency (2011) H4 Odour Management – How to comply with your environmental permit.
[22] The 98th percentile of hourly mean is determined by calculating the odour concentration for every hour of the year at point, sorting these concentrations into ascending order and then taking the value where 98 per cent of the hourly means have lower predicted concentrations.

concentrations mentioned in the guidance have been considered in the assessment of the Project.

Defra odour guidance for local authorities (2010)

1.3.46 Based on Defra's odour guidance for local authorities[23], odour can be characterised by the following five attributes:

a. concentration;

b. recognition;

c. intensity;

d. hedonic tone; and

e. quality/character.

1.3.47 Concentration is the "amount" of odour present in a sample of air. Recognition refers to the human ability to differentiate between odours, such as stale and fresh food, or wine and vinegar. Intensity refers to the magnitude (strength) of perception of an odour (ranging from faint to small). The hedonic tone is a judgment of the relative pleasantness or unpleasantness of an odour made by assessors in an odour panel. Finally, the quality or character of odour refers to a qualitative attribute used to differentiate odours and is expressed in terms of "descriptors", i.e. 'fruity', 'almond', 'fishy'.

1.3.48 A qualitative method using the FIDOR analysis can be used:

a. frequency of detection;

b. intensity as perceived;

c. duration of exposure;

d. openness; and

e. receptor sensitivity.

1.3.49 The frequency and duration can be assessed from emissions and process control data, wind direction data, complaints and odour diaries. The guidance and FIDOR method have been used to determine the impact of any odour emissions from the Project.

Institute of Air Quality Management guidance on the assessment of odours for planning (2014)

1.3.50 The IAQM have recently published guidance[24] for assessing odour impacts for planning purposes. This includes information on various assessment methods to be used to undertaken odour assessments for planning as well advice on determining the significance of a proposed facility based on sensitivity of nearby receptors and the odour impact. The guidance recommends the use of more than one assessment method, for instance, the use of dispersion modelling and a qualitative approach. The guidance has been considered within this assessment to ensure an appropriate level of assessment has been undertaken.

[23] Defra (2010) Odour Guidance for Local Authorities.
[24] IAQM (2014) Guidance on the assessment of odour for planning.

Pollutants assessed

1.3.51 The pollutants considered in the assessment of the ERF emissions include those set out in the IED[25]. These have been considered in the baseline assessment, and are:

a. NO_x and NO_2;
b. carbon monoxide (CO);
c. VOCs: C_6H_6;
d. SO_2;
e. PM_{10};
f. $PM_{2.5}$;
g. HF and HCl;
h. NH_3;
i. Dioxins and Furans;
j. trace metals: Pb, arsenic (As), cadmium (Cd), nickel (Ni), thallium (Ti), mercury (Hg), antimony (Sb), chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn) and vanadium (V); and
k. benzo(a)pyrene (as a polycyclic aromatic hydrocarbon (PAH) marker).

1.3.52 In addition, consideration has been made of NO_2 and PM_{10} in relation to emission from project related traffic; and emissions of odour during operation of the proposed ERF.

1.3.53 For the assessment of impacts on sensitive habitats, the potential impacts of NH_3, NO_x and SO_2 have been assessed, both through the impacts directly to air and through deposition of acid and nutrient nitrogen.

Assessment criteria for pollutants

1.3.54 The air quality objectives and limit values as set out in Vol 2 Appendix 2.1 Table 4 are the air quality standards used within this assessment.

1.3.55 There are no objectives or limit values for HCL or HF; however, in 2006 the Expert Panel of Air Quality Standards (EPAQS) published a report on halogen and hydrogen halides in ambient air[26] which proposed guideline values for protection against short-term irritant and respiratory effects. An addendum to the report, published in 2009 also proposed a monthly mean guideline value for HF for protection against dental fluorosis[27] as set out in Vol 2 Appendix 2.1 Table 7.

[25] Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control).
[26] Guidelines for Halogen and Hydrogen Halides in Ambient Air for Protecting Human Health Against Acute Irritancy Effects, EPAQS (February 2006).
[27] Addendum to Guidelines for Halogen and Hydrogen Halides in Ambient Air, EPAQS (May 2009).

Vol 2 Appendix 2.1 Table 7: Air quality standards for HCl and HF

Pollutant	Averaging period	Limit value / objective
HCl	1-hour mean	750µg/m^3
HF	1-hour mean	160µg/m^3
	Monthly mean	16µg/m^3

1.3.56 There are no air quality objectives or environmental assessment levels for VOCs collectively. It has been assumed therefore that 100 per cent of the VOCs emitted are as C_6H_6, which represents an extreme worst-case assessment.

1.3.57 For trace metals considered, there are European limit values for Pb, As, Cd and Ni (Vol 2 Appendix 2.1 Table 4). For other trace metals, assessment criteria in the form of Environmental Assessment Levels are provided by the EA[19] and the Health and Safety Executive[28]. A summary of the appropriate criteria for other trace metals considered is presented in Vol 2 Appendix 2.1 Table 8. The World Health Organisation (WHO) also provides guidelines for the concentration of some trace metals in air. These are also presented in Vol 2 Appendix 2.1 Table 8.

Vol 2 Appendix 2.1 Table 8: Environmental assessment levels and guideline values for trace metals

Contaminant	Source	Averaging period	Value (µg/m^3)
Sb	Derived from HSE EH40 2001	1-hour mean	150
		Annual mean	5
As	EPAQS	Annual mean	0.003
	UK/EU target	Annual mean	0.006
Cd	UK/EU target	Annual mean	0.005
Chromium, Chromium (II) and Chromium (II) compounds (as Cr)	Derived from HSE EH40 2001	1-hour mean	150
		Annual mean	5
Chromium (VI) oxidation state in the PM_{10} fraction	EPAQS	Annual mean	0.0002
Co	Derived from HSE EH40 2001	1-hour mean	30
		Annual mean	1
Cu	Derived from HSE EH40 2001	1-hour mean	200
		Annual mean	10
Mn	Derived from HSE EH40 2001	1-hour mean	1500
	WHO	Annual mean	0.15

[28] HSE (2001) EH40 2001 Workplace exposure limits.

Contaminant	Source	Averaging period	Value (µg/m^3)
Hg	Derived from HSE EH40 2001	1-hour mean	7.5
		Annual mean	0.25
Ni	EPAQS	Annual mean	0.02
Ti	Derived from HSE EH40 2001	1-hour mean	30
		Annual mean	1
V	WHO	24-hour mean	1
	Derived from HSE EH40 2001	Annual mean	5

1.3.58 There are no UK air quality strategy objectives or European limit values for ammonia. The EA H1 guidance has suggested Environmental Assessment Levels for ammonia of 180µg/m^3 for long-term exposure and 2500µg/m^3 for short-term exposure.

1.3.59 There are no UK air quality strategy objectives or European limit values for dioxins (polychlorinated dibenzo-p-dioxins) and furans (polychlorinated dibenzofurans).

1.4 Baseline conditions

Current baseline

1.4.1 Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment. These are present from various sources, such as industrial processes, commercial and domestic activities, traffic and natural sources.

1.4.2 A desk-based review of the following data sources has been undertaken to determine baseline conditions of air quality on and around the Application Site:

a. local authority review and assessment reports and local air quality monitoring data;

b. air quality monitoring carried out by Arup on the Application Site[29];

c. the Defra UK Air Information Resource website[30] for details on air quality monitoring, AQMAs and predicted background pollutant concentrations by 1x1km Ordnance Survey (OS) grid square for the UK;

d. Ammonia, Acid Gases and Aerosols, and Heavy Metals Monitoring Networks for the UK[31]; and

e. Air Quality England website[32] for local authority background data;

[29] Arup (2013) Edmonton EcoPark: Air Quality Monitoring.
[30] Defra, UK Air Information Resource http://uk-air.defra.gov.uk (Accessed August 2015)
[31] Defra, Ammonia, Acid Gases and Aerosols, and Heavy Metals Monitoring Networks for the UK http://pollutantdeposition.defra.gov.uk/networks (Accessed August 2015)

f. The EA website,[33] for details of environmental permits within a chosen area.

1.4.3 The local authority reports which have been reviewed are those for LB Enfield, LB Haringey and LB Waltham Forest.

1.4.4 The current baseline year has been selected as 2014, as the year with most recent data available. Baseline data has been collected over an area of around 10km from the centre of the Application Site.

1.4.5 Baseline odour conditions have been established through engagement with the local authority to ascertain whether there has been any history of odour complaints in the area. These records have been temporally and spatially reviewed. This engagement was supplemented by the identification of potentially odorous activities in the vicinity of the Application Site which utilised aerial photography and OS mapping.

Arup monitoring survey

1.4.6 Arup undertook a monitoring survey over six months in areas most likely to be affected by emissions from Edmonton EcoPark to provide more information for the baseline assessment of existing air quality conditions in the area.

1.4.7 Passive diffusion tube monitoring of NO_2, SO_2 and VOCs (benzene, toluene, ethylbenzene and xylene) as well as continuous monitoring of NOx and PM_{10} was undertaken. For VOCs there is only an air quality objective for benzene; however, the laboratory provides the other VOCs as a standard analytical suite and these values have been reported for completeness. The monitoring for SO_2 was included because of the presence of Chingford Reservoirs Site of Special Scientific Interest (SSSI) approximately 600m to the east of Application Site boundary.

Continuous monitoring

1.4.8 Continuous air quality monitoring of NO_x and PM_{10} was undertaken between 19 April 2013 and 8 October 2013. The continuous monitor was located at King's Road household waste recycling centre (ID 5 – refer to Vol 2 Figure 2.4). The site was chosen as a location representative of sensitive receptors and with a power supply available for use.

1.4.9 The PM_{10} monitor used in this survey was a Tapered Element Oscillating Microbalance analyser and measurements were adjusted using the Volatile Correction Method as outlined in the Local Air Quality Management Technical Guidance (LAQM TG(09))[34].

Passive diffusion tube monitoring

1.4.10 Diffusion tubes for NO_2, SO_2 and VOCs were attached to street furniture (e.g. lamp posts, road signs) at eleven locations. The tubes were exposed for periods of four weeks and then removed for analysis by a United Kingdom Accreditation Service accredited laboratory. The survey started

[32] Air Quality England, http://www.airqualityengland.co.uk/ (Accessed August 2015)
[33] Environment Agency http://www.environment-agency.gov.uk (Accessed August 2015)
[34] Defra (2009) Local Air Quality Management Technical Guidance, TG(09).

on the 19 March 2013 and was completed on the 12 September 2013. Vol 2 Figure 2.4 presents diffusion tube monitoring locations and the pollutants monitored at each of the locations. Vol 2 Appendix 2.1 Table 9 provides further details for each of the monitoring locations.

1.4.11 Duplicate tubes for each pollutant were used at each site, and triplicate site (3 NO_2 diffusion tubes) was set up at King's Road household waste recycling centre alongside the continuous monitor. This enables the diffusion tube data to be bias adjusted[35] according to local conditions to reduce the uncertainty of this monitoring method.

Vol 2 Appendix 2.1 Table 9: Details of the monitoring locations

Location ID	Name	Easting	Northing	Pollutants monitored	Type
1	Claremont Street	534186	191908	NO_2	Urban background
2	Brookfield Road	534499	193151	NO_2, VOCs	Urban background
3	Woodlands Road	535113	194314	NO_2	Urban background
4	Sedcote Road	535633	195921	NO_2, VOCs	Urban background
5	King's Road Household Waste Recycling Centre	538855	193913	NO_2	Urban background
6	Old Church Road	537686	193897	NO_2, VOCs	Kerbside
7	Waltham Way	537174	194022	SO_2	Kerbside
8	Russel Road – reservoir	536476	192853	SO_2	Background
9	Lower Hall Lane	536399	192546	NO_2	Urban background
10	Waverley Avenue	536670	192556	NO_2, VOCs	Urban background
11	Durban Road	536558	191055	NO_2, VOCs	Urban background
Note: The type of site has been defined according to criteria set out in LAQM TG(09)[34]					

1.4.12 Diffusion tube monitoring was undertaken for six (approximately monthly) monitoring periods between 19 March 2013 and 12 September 2013.

1.4.13 To compare the results with EU limit values/UK air quality objectives, they have been annualised[36] and bias adjusted as required in the methodology set out in LAQM TG(09)[34]. No continuous monitoring of VOCs is available

[35] Bias adjustment corrects for observed over or under estimation of pollutant concentrations owing to systematic analytical errors at the laboratory.
[36] Annualisation is a correction applied to monitoring results when a full calendar year of data is not available

within the vicinity of the monitoring locations therefore annualisation of the data could not be undertaken, however monitored results show that pollutant concentrations are very low and are highly unlikely to exceed the annual mean limit values. This is also the case for SO_2 where the majority of monitored results were below the limit of detection of the laboratory, therefore it is highly unlikely that there would be an exceedence of the annual mean limit value for SO_2.

1.4.14 Further processing of the NO_2 diffusion tube data has been undertaken to enable comparison with the EU limit values/UK air quality objectives. Vol 2 Appendix 2.1 Table 10 provides the details of the continuous monitors used in the annualisation exercise and the adjustment factor which was applied to the diffusion tube period means to provide annual mean concentrations.

Vol 2 Appendix 2.1 Table 10: Calculation of annualisation adjustment factor

Site name	Type	Data capture of annual mean (per cent)	Annual mean (2012)	Period mean (19/03/2013 – 12/09/2013)	Annual mean / Period mean
Perth Terrace	Urban background	93.0	36.8	25.2	1.5
Arsenal	Urban background	89.3	36.4	33.8	1.1
Annualisation adjustment factor					**1.3**

1.4.15 A bias adjustment factor was also determined by comparing data from the triplicate diffusion tube site and the continuous monitor at King's Road household waste recycling centre for the period where both monitors were in place (Vol 2 Appendix 2.1 Table 11). The bias adjustment factor was applied to the annual mean NO_2 concentrations at all monitoring locations to account for uncertainty in the diffusion tube methodology.

Vol 2 Appendix 2.1 Table 11: Calculation of local bias adjustment factor

Site name	Period mean (18/04/2013 – 12/09/2013)
Triplicate Diffusion Tube	19.8
Continuous Monitor	16.3
Local bias adjustment factor	**0.83**

Future baseline

1.4.16 Defra has produced estimated background air pollution data for each 1x1km OS grid square for each local authority area in Britain[30]. Background maps are available for 2001 and projected through to 2030, and have been used to estimate background air quality in future assessment years. Data has been obtained from the Defra UK Air Information Resource website. For pollutants where projections are not available the current estimated or monitored concentrations available have been assumed to remain static in future years. This is a conservative

assumption as it would be expected that pollutant concentrations will improve over time. With improvements in vehicle technology and reductions in industrial emissions air quality concentrations are expected to improve in future years. Trends in air quality concentrations over the past 30 years have shown improvements. Defra includes these future year improvements within its background map concentrations[37].

Receptor identification and sensitivity

1.4.17 Sensitive receptors are defined as those residential properties/schools/ hospitals and ecologically sensitive sites, that are likely to experience a change in pollutant concentrations and/or dust nuisance due to the construction and operation of the Project.

1.4.18 Receptors have been identified for the construction and operational stages of the Project, within designated distances of the Project. For the construction dust assessment receptors have been identified within 350m of the Application Site boundary (as discussed within Section 1.5), and for the operational assessment discrete receptors have been chosen surrounding the Application Site, and over a 10km by 10km gridded area (as discussed within Section 1.6). Discrete receptor sites were selected using professional judgement. Receptors included residential areas and schools covering a wide area surrounding the Application Site. Their locations can be seen in Vol 2 Figure 2.7.

1.5 Construction effects

1.5.1 The main air quality impacts that may arise during construction of the Project are:

a. dust deposition, resulting in the soiling of surfaces;

b. elevated PM_{10} concentrations as a result of dust generating activities on-site (i.e. health effects); and

c. an increase in NO_2 and PM_{10} concentrations due to exhaust emissions from non-road mobile machinery and vehicles accessing the Application Site.

1.5.2 The following text describes the methodology to assess each of these elements. With regard to non-road mobile machinery, this is adequately controlled through the requirements set out in the CoCP (Vol 1 Appendix 3.1) and therefore no assessment of this element is required.

Assessment of Project stages

1.5.3 The assessment has been carried out by Project development stage, and looks at the type of works taking place at each stage, the sensitivity of the surrounding area and determines the risk of impacts.

1.5.4 The aspects of each development stage most relevant to the air quality assessment for construction are outlined in Vol 2 Appendix 2.1 Table 12.

[37] Defra (2009) Local Air Quality Management Technical Guidance (February 2009).

Vol 2 Appendix 2.1 Table 12: Aspects of each development stage relevant to the air quality assessment - construction

Stage	Relevant aspects
Stage 1a: Site preparation and enabling works Stage 1b: Construction of Resource Recovery Facility (RRF), EcoPark House and commence use of Temporary Laydown Area Stage 1c: Operation of RRF, EcoPark House and demolition/clearance of northern area Stage 1d: Construction of ERF	• Potential to generate dust from earthworks, trackout and construction/demolition activities associated with the construction of the RRF, EcoPark House and ERF. • Emissions from construction equipment and vehicles. • Potential odour emissions from in-vessel composting removal.
Stage 2: Commissioning of ERF alongside operation of Energy from Waste (EfW) facility, i.e. transition period	• Does not involve any major construction work, has low potential for dust generation. • Emissions from construction equipment and vehicles.
Stage 3: Operation of ERF, RRF and EcoPark House and demolition of EfW facility	• Demolition of EfW facility has the potential for generation of dust emissions. • Emissions from construction equipment and vehicles.
Stage 4: Operation of ERF, RRF and EcoPark House, i.e. final operational situation	This stage does not involve any further construction/demolition works, therefore has not been assessed in terms of construction effects.

1.5.5 All Project development stages are addressed in the construction assessment.

1.5.6 Measures to mitigate construction air quality and dust impacts have been included in the CoCP (see Vol 2 Appendix 3.1) which apply to all construction/demolition works. The CoCP contains all applicable measures required to reduce any impacts to a negligible level based on the risk of dust impacts as defined in the assessment.

Assessment area

1.5.7 The assessment area for the construction assessment has looked at sensitive receptors within 20m, 50m, 100m and 350m of the Application Site boundary[38], as required by the IAQM guidance[20].

1.5.8 The assessment area for the traffic air quality assessment has been defined by those roads identified as experiencing a change in traffic flow or speed by the transport assessment (see Vol 2 Section 10).

1.5.9 The assessment area for the odour assessment has looked at the nearest residential receptors and users of the adjacent land.

[38] Application Site boundary as presented in the DCO application which is updated from the Application Site boundary presented in the Scoping Report.

Assessment method

Dust assessment

1.5.10 A qualitative assessment of construction impacts has been undertaken, with reference to the IAQM[20] and GLA[2] best practice guidance.

1.5.11 As the GLA guidance is based on that previously produced by the IAQM, the methodology applied has been based on the IAQM guidance document.

1.5.12 The IAQM guidance considers the potential for dust emissions from dust-generating activities, such as demolition of existing structures, earthworks, construction of new structures and trackout. Earthworks refer to the processes of soil stripping, ground levelling, excavation and land capping, while trackout is the transport of dust and dirt from a site onto the public road network where it may be deposited and then re-suspended by vehicles using the network. This arises when vehicles leave a site with dusty materials, which may then spill onto the road, or when they travel over muddy ground on-site and then transfer dust and dirt onto the road network.

1.5.13 For each of these dust-generating activities, the guidance considers three separate effects: annoyance due to dust soiling; harm to ecological receptors; and the risk of health effects due to a significant increase in PM_{10} exposure. The receptors can be human or ecological and have been chosen based on their sensitivity to dust soiling and PM_{10} exposure.

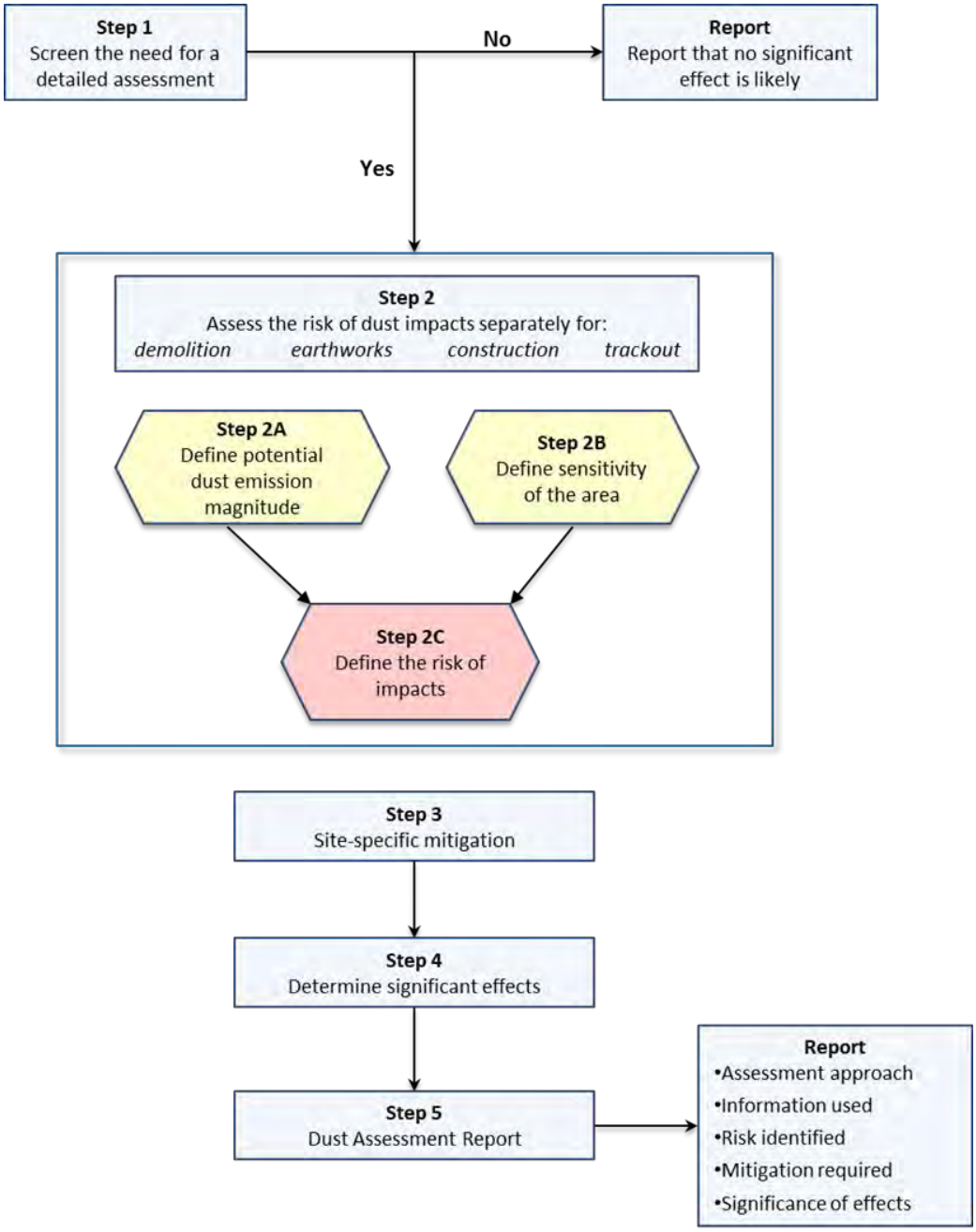
1.5.14 The methodology takes into account the scale to which the above effects are likely to be generated (classed as small, medium or large), along with the local levels of background PM_{10} concentrations and the distance to the closest receptor, in order to determine the sensitivity of the area (classed as low, medium or high sensitivity). This is then taken into consideration when deriving the overall risk for the Application Site, which is used to identify suitable mitigation measures, to reduce the risk of the Application Site where necessary.

1.5.15 There are five steps in the assessment process described in the IAQM guidance. These are summarised in Vol 2 Appendix 2.1 Plate 1. The assessment has been undertaken for Stages 1-3 of the Project (i.e. all stages involving demolition/construction activities).

1.5.16 **Step 1: Need for assessment** – the first step is the initial screening for the need for a detailed assessment. According to the IAQM guidance, an assessment is required where there are sensitive receptors within 350m of the Application Site boundary (for ecological receptors that is 50m) and/or within 50m of the route(s) used by the construction vehicles on the public highway and up to 500m from the site entrance(s). The guidance notes that these distances are indicative and the use of professional judgement is encouraged; it is likely that some developments may need the use of greater separation distances. This initial step was carried out as part of the scoping assessment and it was identified that there are human receptors within 350m of the Application Site boundary. On the basis of these criteria a detailed assessment is required for the Project.

1.5.17 **Step 2: Assess risk of dust impacts** – this step is split into three sections as follows:

- 2A – Define the potential dust emission magnitude;
- 2B – Define the sensitivity of the area; and
- 2C – Define the risk of impacts (drawing together 2A and 2B).



Vol 2 Appendix 2.1 Plate 1: IAQM dust assessment methodology

1.5.18 Step 2A identifies the scale and nature of the works, which classifies the potential dust emission magnitude as small, medium or large.

1.5.19 Each of the construction activities has been assigned a dust emission magnitude, based on the criteria shown in Vol 2 Appendix 2.1 Table 13.

Vol 2 Appendix 2.1 Table 13: Categorisation of dust emission magnitude

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

1.5.20 The sensitivity of the surrounding area is then determined (step 2B) for each dust effect from the above dust-generating activities, based on the proximity and number of receptors, their sensitivity to dust, the local PM_{10} background concentrations and any other site-specific factors.

1.5.21 The sensitivity of an area is based on the IAQM guidance and professional judgement. Firstly the sensitivity of the receptors is identified using the general principles set out in Vol 2 Appendix 2.1 Table 14.

Vol 2 Appendix 2.1 Table 14: Examples of factors defining sensitivity of receptors

Sensitivity of surrounding area	General principles		
	Sensitivity of people to dust soiling effects	**Sensitivity of people to the health effects of PM_{10}**	**Sensitivity of the area to ecological impacts**
High	Users can reasonably expect enjoyment of a high level of amenity; or The appearance, aesthetics or value of their property would be diminished by soiling; and The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Indicative examples include dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (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) Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	Locations with an international or national designation and the designated features may be affected by dust soiling; or Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or The appearance, aesthetics or value of their property could be diminished by soiling; or The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Indicative examples include parks and places of work.	Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (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). Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or Locations with a national designation where the features may be affected by dust deposition. Indicative example is a SSSI with dust sensitive features.
Low	The enjoyment of amenity would not reasonably be expected; or Property would not reasonably be expected to be diminished in	Locations where human exposure is transient. Indicative examples include public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. Indicative example is a local Nature Reserve with

Sensitivity of surrounding area	General principles		
	Sensitivity of people to dust soiling effects	Sensitivity of people to the health effects of PM_{10}	Sensitivity of the area to ecological impacts
	appearance, aesthetics or value by soiling; or There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short-term car parks and roads.		dust sensitive features.

1.5.22 Once the sensitivity of specific receptors is identified, the sensitivity of the area is determined on the basis of the three criteria; the sensitivity of the area to dust soiling effects on people and property, the sensitivity of the area to human health impacts and sensitivity of the area to ecological impacts.

1.5.23 Vol 2 Appendix 2.1 Table 15, Vol 2 Appendix 2.1 Table 16 and Vol 2 Appendix 2.1 Table 17 show the criteria for defining the sensitivity of the area to the different dust effects.

Vol 2 Appendix 2.1 Table 15: Sensitivity of the area to dust soiling effects on people and property

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

Vol 2 Appendix 2.1 Table 16: Sensitivity of the area to human health impacts

Annual mean PM_{10} concentration	Number of receptors	Distance from the source (m)				
		<20	<50	<100	<200	<350
High receptor sensitivity						
> 32µg/m^3	> 100	High	High	High	Medium	Low

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

Vol 2 Appendix 2.1 Table 17: Sensitivity of the area to ecological impacts

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

1.5.24 The overall risk of the impacts for each activity is then determined (step 2C) prior to the application of any mitigation measures (Vol 2 Appendix 2.1 Table 18) and an overall risk for the Application Site derived.

1.5.25 Where there are different sensitivities for dust soiling, human health and ecological the worst-case sensitivity is used for the assessment.

Vol 2 Appendix 2.1 Table 18: Risk of dust impacts

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
Demolition			
High	High risk site	Medium risk site	Medium risk site
Medium	High risk site	Medium risk site	Low risk site
Low	Medium risk site	Low risk site	Negligible
Earthworks			
High	High risk site	Medium risk site	Low risk site
Medium	Medium risk site	Medium risk site	Low risk site
Low	Low risk site	Low risk site	Negligible
Construction			
High	High risk site	Medium risk site	Low risk site
Medium	Medium risk site	Medium risk site	Low risk site
Low	Low risk site	Low risk site	Negligible
Trackout			
High	High risk site	Medium risk site	Low risk site
Medium	Medium risk site	Low risk site	Negligible
Low	Low risk site	Low risk site	Negligible

1.5.26 **Step 3: Determine the site-specific mitigation** - once each of the activities is assigned a risk rating, appropriate mitigation measures are identified. The level of mitigation required and its management is included in the CoCP (Vol 1 Appendix 3.1) for the Project. Where the risk is negligible, no mitigation measures beyond those required by legislation are necessary.

1.5.27 Limitations of dust assessment such as the unpredictable effects from weather have been accounted for in the assessment by applying a level of mitigation which would remove any significant effects irrespective of the weather.

1.5.28 **Step 4: Determine any significant residual effects** - once the risk of dust impacts has been determined and the appropriate dust mitigation measures identified and confirmed as included in the CoCP, the final step is to determine whether there are any residual significant effects. Experience indicates that once required mitigation measures are applied, in most cases the dust effects would be reduced to negligible levels.

1.5.29 **Step 5: Prepare a dust assessment report** - the last step of the assessment is the preparation of a Dust Assessment Report. This is contained in the ES (AD06.02).

Construction odour

1.5.30 A qualitative assessment has been undertaken to assess the potential risk of odour nuisance emissions during construction using the FIDOR[39] methodology as detailed in the H4[21] and IAQM guidance[24]. The method sets five factors to be assessed in order to establish whether odour emissions result in significant pollution in the area:

a. **F**requency of detection
b. **I**ntensity of the odour
c. **D**uration
d. **O**ffensiveness
e. **R**eceptor sensitivity

1.5.31 Frequency and duration of odour detection are determined by two factors, the level of odour emissions and the local weather conditions (particularly wind speed, direction and atmospheric stability). A receptor located downwind of the prevailing wind is more likely to be affected by odours.

1.5.32 Intensity is a combination of the strength of the odour at its source and its dilution as it disperses in the atmosphere. As dilution increases with distance downwind, receptors located closer to the source of the odour are more likely to experience an odour nuisance.

1.5.33 Offensiveness is determined by the nature of the odour. Some odours, such as baking bread, are considered to be pleasant and less likely to result in a nuisance. Other odours, however, such as decaying animal remains, are regarded as highly offensive and much more likely to result in a nuisance.

1.5.34 Location sensitivity acknowledges that some receptors are more sensitive than others. The IAQM guidance notes that domestic residences and hospitals are likely to be more sensitive than an industrial complex or farm. It also notes that the sensitivity of the receptor should be considered when determining offensiveness too.

1.5.35 The FIDOR factors are all considered to determine the level of risk of odour nuisance (low, medium or high risk) using professional judgement.

Traffic emissions - construction and operation

1.5.36 The Project has the potential to impact on existing air quality as a result of road traffic exhaust emissions during all Project stages. These emissions include NO_2 and PM_{10}, and are associated with vehicles travelling to and from the Application Site.

1.5.37 A screening assessment has been undertaken using the criteria contained within the EPUK/IAQM[6] guidance document and the Design Manual for Roads and Bridges (DMRB) air quality section[40] to determine the required level of detail for the assessment.

[39] Frequency, Intensity, Duration, Offensiveness and Receptor. The FIDOR factors are used as a basic means of assessing the potential odour impact of proposed developments.
[40] Highways Agency (2007) DMRB: Air Quality Advice Note HA 207/07.

1.5.38 Total traffic flows derived from the transport assessment (Vol 2 Section 10) for each of the Project stages (Stages 1-4) are assessed with construction and operational traffic assessed together. Construction and operations would occur concurrently in some of these stages and hence emissions from traffic associated with both have been considered together.

1.5.39 The EPUK6 and DMRB[40] screening methods have been used to assess the impacts of traffic movements in the local area. Using both methods is considered to be a robust approach as all applicable changes in flows or road design are screened.

1.5.40 The EPUK/IAQM guidance document details the following criteria to help establish when an air quality assessment is likely to be considered necessary:

a. a change of LDV flows of more than 100 in Annual Average Traffic Daily (AADT) within or adjacent to an AQMA or more than 500 AADT elsewhere;

b. a change of HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;

c. a change in road alignment of more than 5m and the road is in an AQMA;

d. introduction of a new junction that causes a significant change in vehicle acceleration/deceleration;

e. introduction or change of a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; or

f. have an underground car park with extraction system.

1.5.41 Should these criteria not be met, then the EPUK/IAQM guidance document considers air quality impacts associated with a scheme to be negligible and no further assessment is required.

1.5.42 The criteria detailed in the DMRB have also been applied to identify whether further assessment is required. These criteria are:

a. road alignment would change by 5m or more; or

b. daily traffic flows would change by 1,000 AADT or more; or

c. HDV flows would change by 200 AADT or more; or

d. daily average speed would change by 10km/hr or more; or

e. peak hour speed would change by 20km/hr or more.

1.5.43 Where a scheme is considered not to require further assessment (i.e. screening criteria are not met) then impacts are considered to be negligible and therefore not significant.

1.5.44 Where a scheme is considered to require further assessment, a more detailed screening assessment is undertaken using the DMRB screening

spreadsheet from Highways England[41], and significance determined through the methodology in the EPUK/IAQM guidance.

1.5.45 The DMRB screening spreadsheet takes as input the traffic flows, the percentage of HDVs and the vehicle speed and distance from the centre of the road to the nearest residential receptor, and uses these to estimate pollutant concentrations at the receptor location. This spreadsheet is then used to estimate the change in annual mean pollutant concentrations for daily average traffic flows for each of the Project stages. The percentage change in concentration relative to the relevant air quality objective between the baseline and 'with development' scenarios is then assessed as per EPUK/IAQM guidance, where a large percentage change is considered to be >10 per cent; a medium change is 6-10 per cent; a small change is 2-5 per cent; an imperceptible change is 1 per cent; and a negligible change is <0.5 per cent. Where a change is small, imperceptible or negligible, it is considered that no further assessment is required.

Significance criteria

1.5.46 Taking into consideration the determined dust emission magnitude and the sensitivity of the area, the Application Site is classified a dust risk of either low, medium or high as set out in Vol 2 Appendix 2.1 Table 18. It is on this basis that appropriate mitigation has been identified that is included in the CoCP (see Vol 1 Appendix 3.1).

1.5.47 In EIA terms, it is considered that where the overall construction dust significance is deemed to be negligible or low risk, the overall significance of the Project would likely be not significant. Where the significance is deemed to be medium risk or high risk the overall significance would likely be significant. This is assessed using professional judgement.

1.5.48 The significance of any odour emissions from the Application Site is based on professional judgement based on the FIDOR. A low risk of odour nuisance is considered to be not significant. Anything higher is considered as significant. Any improvements will be considered a beneficial effect and will be considered not significant.

1.5.49 For traffic impacts, the screening methods would indicate the impacts were not significant. Should the screening indicate a project is considered to require further assessment, a detailed modelling study using ADMS-Roads would be required. Significance would then be determine through the methodology in the EPUK/IAQM guidance6, which is detailed in Section 1.6 below.

1.6 Operational effects

1.6.1 The assessment of air quality impacts during operation comprises an assessment of the impacts of emissions from the stack, diesel generators and other fugitive sources on local air quality (compared to the existing

[41] Highways England (2007) DMRB Air Quality Spreadsheet (2.2MB Zip File) Version 1.03c (July 2007) http://www.standardsforhighways.co.uk/guidance/air-quality.htm (Accessed August 2015)

facility), an assessment of the impacts of the stack and diesel generator emissions on sensitive habitat sites in relation to ammonia, NO_x and SO_2 emissions, an assessment of plume visibility, an assessment of the risk of odour nuisance and an assessment of the potential impacts on human health.

1.6.2 Air quality impacts from changes in traffic on the local road network are considered in the construction assessment which assesses total Project stage generated traffic (i.e. construction and operational project traffic - see Paragraphs 1.5.36-1.5.43). No further assessment is therefore required in the operational assessment.

Assessment of Project stages

1.6.3 Operational effects of the Project can result from combustion source emissions related to the operation of the EfW facility and the ERF. The aspects of each development stage most relevant to the air quality assessment for operation are outlined in Vol 2 Appendix 2.1 Table 19. Operational effects have been assessed for all development stages of the Project.

Vol 2 Appendix 2.1 Table 19: Aspects of each development stage relevant to the air quality assessment - operation

Stage	Relevant aspect
Stage 1a: Site preparation and enabling works Stage 1b: Construction of RRF, EcoPark House and commence use of Temporary Laydown Area Stage 1c: Operation of RRF, EcoPark House and demolition/clearance of northern area Stage 1d: Construction of ERF	• Existing EfW facility stack emissions. • Emissions from operational vehicles associated with the existing EfW facility and other ongoing site operations (it is noted that the operational traffic emissions are assessed with construction traffic to ensure that all traffic associated with site activity is assessed). • Risk of odour emissions. • Risk of fugitive emissions and dust.
Stage 2: Commissioning of ERF alongside operation of EfW faciliity, i.e. transition period	• Stack emissions from the EfW facility and ERF. • Emissions from diesel generators. • Emissions from operational vehicles associated with the EfW facility and ERF and other ongoing site operations (it is noted that the operational traffic emissions are assessed with construction traffic to ensure that all traffic associated with site activity is assessed). • Risk of odour emissions. • Risk of fugitive emissions and dust.
Stage 3: Operation of ERF, RRF and EcoPark House and demolition of EfW facility	• ERF stack emissions. • Emissions from diesel generators. • Emissions from operational vehicles associated with the ERF and other ongoing site operations (it is noted that the operational traffic emissions are assessed

Stage	Relevant aspect
	with construction traffic to ensure that all traffic associated with site activity is assessed). • Risk of odour emissions. • Risk of fugitive emissions and dust.
Stage 4: Operation of ERF, RRF and EcoPark House, i.e. final operational situation	• Stack emissions from the ERF would be the same as in Stage 3. • Emissions from diesel generators would be the same as in Stage 3. • Emissions from operational vehicles associated with the ERF and other ongoing site operations. • Risk of odour emissions. • Risk of fugitive emissions and dust.

1.6.4 For the ES (AD06.02), the human health risk assessment (HHRA) (Vol 2 Appendix 2.3) looks at Stages 2, 3 and 4 of the Project, when the ERF would be operational.

Assessment area

1.6.5 The assessment area for the assessment is a 10km radius from the centre of the Application Site[38]. This is based on the screening distance for nature conservation sites required in the EA's H1 guidance[19]. Vol 2 Figure 2.8 shows the extent of the grid. The assessment has shown that area is more than sufficient to identify all potentially significant impacts.

Assessment method

Combustion source emissions

1.6.6 Operational air quality impacts from the Project arise principally as a result of combustion source emissions from the ERF stack and from diesel generators, to a lesser extent.

1.6.7 There are no other significant on-site emission sources. The approach to the assessment of fugitive emissions is provided in Paragraphs 1.6.58 to 1.6.59.

1.6.8 The proposed ERF would produce energy from waste and have a greater efficiency than the existing EfW facility. The ERF would comprise of two process lines, with each line having a waste capacity of 350,000tpa. Each line comprises of a moving grate, furnace, boiler and a flue gas treatment plant. Both flues would be located in one stack.

1.6.9 The proposed diesel generators would be used in the event of a power failure at the Application Site, to facilitate emergency shutdown procedures, and for triad periods during operation as required.

1.6.10 Emissions from the ERF stack flue and the diesel generators have the potential to impact nearby sensitive receptors, and therefore an assessment is required to quantify any impact.

1.6.11 Effects of generated emissions has been assessed using the ADMS 5 atmospheric dispersion model. ADMS is an advanced dispersion model developed by the UK consultancy Cambridge Environmental Research Consultants. ADMS models are widely used and validated within the UK and Europe. The model allows for the skewed nature of turbulence within the atmospheric boundary layer. An equivalent model, ADMS-Urban, is often used by local councils for air quality review and assessment work.

1.6.12 Emissions data has been provided by Ramboll (see Vol 2 Appendix 2.1 Table 21).

1.6.13 Two flue gas treatment mitigation technology options are proposed for the ERF at the time of writing; wet and combined. Emissions for both systems are the same and so the wet scenario has been modelled, and can be considered representative of both technology options.

1.6.14 If the wet option is used, then reheating can be also used to raise the temperature of the flue gases, which would increase the buoyancy of the emitted gases and improve dispersion. It would also reduce the incidence of visible plumes, (i.e. when the water in the gases condenses into liquid forming a visible plume). Data for the wet option has therefore been provided with and without a reheat option. As such, two Flue Gas Technology (FGT) scenarios have been considered for the operational assessment (Stages 3/4); 'wet' without reheat, and 'wet with reheat'. Results for these two options are reported in the ES (AD06.02).

1.6.15 Both options (wet and combined) would be used with Selective Catalytic Reduction (SCR) to reduce NO_x emissions and manufacturers are likely to guarantee a NO_x emission level of 80mg/Nm^3, compared to the IED main mean emission limit value of 200 mg/Nm^3. Actual NO_x emissions are likely to be lower than 80mg/Nm^3.

1.6.16 The Applicant has therefore proposed a NO_x emission limit of 80mg/Nm^3, which has been used as the basis for a worst-case assessment.

1.6.17 The SCR process does not significantly change the volumetric flows, the moisture content or the temperatures of the emitted gases. Therefore, the only change in emission data between the two options is the NO_x mass emission rate. For a worst-case assessment the NO_x emission limit of 80mg/Nm^3 has been used in the assessment, however with the use of SCR emissions would be lower.

1.6.18 The total annual operational hours for the diesel generators for operation (Stages 3/4) are assumed to be 56 hours, allowing for emergency shutdown, monthly testing to ensure operability and extended annual testing. For triad periods, the total annual operational hours for the diesel generators are assumed to be 150 hours. Two diesel generators are proposed, and it is assumed they are run concurrently during operation. Diesel generator emissions have been assessed cumulatively with emissions from the ERF stack.

1.6.19 Details of all emissions and model inputs included in the air quality assessment are shown in Vol 2 Appendix 2.1 Table 21.

1.6.20 The assessment scenarios are summarised in Vol 2 Appendix 2.1 Table 20. The transition period is discussed further below.

Vol 2 Appendix 2.1 Table 20: Modelling assessment scenarios for existing EfW facility and ERF

Project stage	Technology	Model scenario
Stage 1	Existing EfW facility	Existing
Stage 2	Transition period	ERF 100 per cent*
		EfW facility one line/ ERF 70 per cent
		EfW facility three lines/ ERF 70 per cent
Stages 3 and 4	Wet flue gas treatment	Wet without reheat
		Wet with reheat

Model setup

1.6.21 Detailed dispersion modelling has been undertaken using the latest ADMS 5 atmospheric dispersion model from Cambridge Environmental Research Consultants. This is a well-established model widely used in the UK and is a type of model known as a “new generation” dispersion model favoured by the EA.

1.6.22 Modelling is used to assess the effects of the Project on local air quality and nearby sensitive habitat sites.

Diesel generator stack location

1.6.23 Sensitivity analysis has been undertaken to determine the worst case stack location for the proposed diesel generators. The stack located at grid reference 535692,192835 was determined to have the highest process contributions. This stack location has been taken forward for assessment of the diesel generators, as a worst-case assessment.

Emissions data

1.6.24 Details of all emissions included in the assessment are shown in Vol 2 Appendix 2.1 Table 21 and Vol 2 Appendix 2.1 Table 22. For the ERF, IED daily average emissions as shown in Vol 2 Appendix 2.1 Table 5 have been used where they are greater than the predicted ERF emissions, as a worst-case assessment, and so the emissions are the same for the two wet flue gas treatments.

Vol 2 Appendix 2.1 Table 21: Emissions data and model inputs for existing EfW facility and ERF by Project stage

	Stage 1	Stage 2	Stages 3 and 4	
	Existing EfW facility	EfW facility three lines/ ERF 70 per cent (total emissions)	ERF with wet flue gas treatment	
			Wet without reheat	Wet with reheat
Stack height (m)	100	100	100	100
Stack diameter (m)[42]	3.17	3.17/ 3.78	3.78	4.0
Efflux velocity (m/s)	31.1	31.1/ 15	15	15
Efflux temp (°C)	145	145/ 60	60	100
NOx emission rate (g/s)	28.08	24.44	10.84	10.84
CO emission rate (g/s)	5.20	7.86	6.78	6.78
TOC emission rate (g/s)	0.08	1.00	1.36	1.36
NH_3 emission rate (g/s)	0.94	0.66	0.14	0.14
PM emission rate (g/s)	0.25	1.10	1.36	1.36
HCl emission rate (g/s)	0.81	1.44	1.36	1.36
HF emission rate (g/s)	0.005	0.098	0.14	0.14
SO_2 emission rate (g/s)	0.86	5.26	6.78	6.78
Cd and Tl emission rate (g/s)	0.0002	0.005	0.007	0.007
Sum of 9 metals emission rate (g/s)	0.011	0.054	0.068	0.068
Hg emission rate (g/s)	0.0001	0.005	0.007	0.007
Dioxin/ Furan emission rate (mg/s)	0.0000086	0.000010	0.000014	0.000014
Moisture content (per cent w/w/)	9.31	-	13.66	13.66

Vol 2 Appendix 2.1 Table 22: Emissions data and model inputs for diesel generators

	Stages 2, 3 and 4
	Diesel generators
Stack height (m)	69
Stack diameter (m)	0.7
Efflux velocity (m/s)	20
Efflux temp (°C)	500
NOx emission rate (g/s)	8.66

[42] Equivalent diameter for a single flue stack; the model has assumed a single flue with the same area as the two flues combined.

	Stages 2, 3 and 4
	Diesel generators
PM emission rate (g/s)	0.041

Transition period

1.6.25 During Stage 2 of the works, when the transition between the existing EfW facility and the proposed ERF takes place, there would be a period where both plants are running concurrently. This has been assessed for a worst-case model scenario.

1.6.26 Commissioning of the ERF would broadly fall into the following three periods, which would take place over approximately one month each, and would result in the following ERF and EfW facility operations:

a. cold commissioning – no waste processing takes place at the ERF. The plant is checked for mechanical completeness and readiness to progress to hot commissioning;

b. hot commissioning – this is when first fire takes place and there is an overlap of EfW facility and ERF operations; and

c. trial operations – ERF operations should be stable and achieving the desired emissions limits. Operations in the range of 70 per cent to 100 per cent.

1.6.27 To test these operations, the following scenarios have been selected (as shown in Vol 2 Appendix 2.1 Table 20):

a. ERF operating at 100 per cent, with hypothetical worst-case emissions;

b. EfW facility operating one line and ERF operating two lines at 70 per cent; and

c. EfW facility operating three lines and ERF operating one line at 70 per cent.

1.6.28 These scenarios have been assessed for a full annual period as a worst-case assessment.

1.6.29 Following sensitivity analysis of the three scenarios, the third scenario (EfW facility operating three lines and ERF operating one line at 70 per cent) has the highest emissions and has shown to predict the highest process contributions. This scenario has been taken forward for assessment of the transition stage (Stage 2), as a worst-case assessment.

1.6.30 For the diesel generators during the transition stage (Stage 2), total annual operational hours have been assumed to be 42 hours, allowing for testing of the generators.

Meteorological data

1.6.31 Five years of hourly sequential observation data for 2010 to 2014 from the London City Airport meteorological monitoring site have been used to undertake an annual sensitivity assessment, with the worst-case meteorological data year selected for the modelling study.

1.6.32 Vol 2 Appendix 2.1 Table 23 shows model results for each year for comparison purposes. These data show a comparison of the modelled receptors for each year (2010 to 2014) and the modelled grid area for the selected worst-case London City years (2010 and 2014). Overall 2014 was considered to be the worst-case meteorological year for London City as it gave the highest concentrations.

1.6.33 London City 2014 results were also then compared with 2014 meteorological monitoring data from the Heathrow Airport monitoring site. London City was still considered to be the worst-case meteorological station, and therefore this has been selected for the modelling study.

Vol 2 Appendix 2.1 Table 23: Meteorological sensitivity assessment results

	London City Airport					**London Heathrow Airport**
	2010	**2011**	**2012**	**2013**	**2014**	**2014**
Maximum NO_x concentration at sensitive receptor points ($\mu g/m^3$)	0.0438	0.0729	0.0654	0.0475	0.0577	0.0364
Average NO_x concentration at sensitive receptor points ($\mu g/m^3$)	0.0142	0.0144	0.0134	0.0146	0.0148	0.0141
Number of times the year had the maximum NO_x concentration, per receptor	31	9	4	19	30	21
Maximum NO_x concentration over gridded area ($\mu g/m^3$)	0.050	-	-	-	0.059	0.039
Average NO_x concentration over gridded area ($\mu g/m^3$)	0.014	-	-	-	0.016	0.016

1.6.34 Vol 2 Figure 2.11 shows the relevant windrose for London City Airport for 2014, selected at the worst-case meteorological year.

Buildings

1.6.35 Buildings can affect airflow and the trajectory of the plume. The main EfW facility and ERF buildings have been included in the model as shown in Vol 2 Figure 2.12. The building dimensions included are shown in Vol 2 Appendix 2.1 Table 24.

Vol 2 Appendix 2.1 Table 24: Buildings included in the model

Building Name	**OS Grid Reference**		**Angle**	**Length (m)**	**Width (m)**	**Height (m)**
	X	**Y**				
Existing Buildings						
A	535782	192639	68	96	71	31
B	535765	192555	68	69	41	16
Proposed Buildings						

Building Name	OS Grid Reference		Angle	Length (m)	Width (m)	Height (m)
	X	Y				
ERF 1,2,3,4 and 7	535788	192835	15	74	225	54
ERF 5	535645	192867	15	60	24	26
RRF	535749	192424	335	160	125	30

Surface roughness and atmospheric turbulence

1.6.36 The extent of mechanical turbulence (and hence, mixing) in the atmosphere is affected by the surface/ground over which the air is passing. Typical surface roughness values range from 1.5m (for cities, forests and industrial areas) to 0.0001m (for water or sandy deserts). In this assessment, the general land use in the local study area has been described as “cities, woodlands” with a corresponding surface roughness of 1m.

1.6.37 Another model parameter is the minimum Monin-Obukhov length, which describes the minimum level of turbulence in the atmosphere. Typical values range from 2m to 20m for rural areas. In urban areas though, where traffic and buildings cause the generation of more heat, these values are higher. For this assessment, a value of 30m was used corresponding to “cities and large towns”.

Background concentrations

1.6.38 Background concentrations for each pollutant and each stage of the Project have been determined in Vol 2 Section 2.5 and these data used in the modelling study.

NO_x to NO_2 conversion

1.6.39 The air quality model used predicted concentrations of nitrogen oxides which is a mixture of mainly NO_2 and nitric oxide. Both gases react in the atmosphere particularly with ozone and, in general, the nitrogen oxides are mainly emitted as nitric oxide and this converts to NO_2 in the atmosphere. The air quality standard has been set for NO_2 and therefore it is important that an appropriate conversion rate is used. The EA has advice[43] on conversion rates to be applied that suggests a worst-case assumption of 35 per cent for short-term (i.e. hourly average) and 70 per cent for long-term (i.e. annual mean) average concentration should be considered. In practice, these ratios represent conditions some distance away from a release source. Close to a source, the proportion of NO_2 in nitrogen oxides is typically much lower than this. Applying these ratios thus provides a worst-case assessment.

1.6.40 The guidance also has a second step which recommends next steps to be taken to determine a site specific NO_x to NO_2 ratio. This process requires

[43]Conversion ratios for NOx and NO_2 (Accessed August 2015)
(**Error! Hyperlink reference not valid.**http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/static/documents/Conversion_ratios_for__NOx_and_NO2_.pdf

detailed justification of any alternative ratios considered for the Application Site.

Model outputs

1.6.41 Pollutant concentrations for all the pollutants identified in Paragraph 1.3.51 have been predicted at selected discrete receptor locations, and over a wider gridded area.

Ecology

1.6.42 All sensitive European designated ecological sites (SACs, SPAs, SSSIs) within 10km of the development have been considered within the air quality assessment. A map showing the locations of the sensitive ecological sites and the selected ecological report locations is shown in Vol 2 Figure 2.9.

1.6.43 Selected receptor locations have been chosen as the nearest points on the designated site boundaries to the Application Site. Where the ecological sites are large, several receptors have been selected. The ecological sites are also covered by the modelled grid area as shown in Vol 2 Figure 2.8.

1.6.44 Critical Levels, set in EU directives, are defined as "concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge". The critical levels used in this assessment are detailed in Vol 2 Appendix 2.2.

1.6.45 EA guidance recommends that if the predicted contribution of the installation under investigation (Process Contribution) exceeds 1 per cent of the Critical Level, then the contribution of the installation in conjunction with the prevailing background airborne concentration (Predicted Environmental Concentration) must be assessed against the Critical Level. If the total Predicted Environmental Contribution is less than 70 per cent of the Critical Level, the installation is not likely to have a significant effect on the sensitive ecosystem. This screening criterion is applied to this assessment as described in Section 1.3.

Assessment Criteria for Qualifying Features in designated European Sites - Critical Loads for Nitrogen Deposition.

1.6.46 Critical Loads are defined as: "*a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge*". Site and habitat specific critical loads and existing deposition rates have been taken from the Air Pollution Information System (APIS) website[44].

1.6.47 The information on the critical loads for nitrogen and acidity are provided in Vol 2 Appendix 2.1 Table 25. There are different critical loads specified for Epping Forest SSSI and SPA even though they are in the same location. To assess this the receptors at Epping Forest are compared against both sets of critical loads.

[44] APIS http://www.apis.ac.uk/ (Accessed April 2015).

1.6.48 The critical loads are set as ranges, reflecting the uncertainty in the present scientific knowledge and evidence-base on the effects of air pollution on sensitive species. If the upper limit critical load is being exceeded, it is likely that there is harm to the relevant habitat/features arising from the current level of nitrogen deposition. If the deposition level is below the lower limit critical load, it is unlikely that the feature/habitat is being harmed. If the deposition level lies between the lower and upper critical load values, it is not possible to be certain that harmful effects are, or are not, occurring.

1.6.49 For the purposes of this study, a precautionary approach is adopted and the dispersion modelling predictions are assessed against the lower critical load values for each qualifying feature/habitat.

1.6.50 To assess the Critical Load Functions (CLFs) for acidity is it not straightforward to apply the 1 per cent (or 10 per cent) significance tests to acidity, as acidity comprises components from both nitrogen and sulphur. For acidity deposition, the interplay between nitrogen (N) and sulphur (S) acid deposition is represented by critical load functions, which are site- and feature/habitat- specific. The relevant CLFs for this study have been derived from the most up-to-date information on the APIS website.

1.6.51 The CLFs comprise two lines on a graph, which represent two envelopes of safety (reflecting the present uncertainty in the scientific knowledge and evidence-base on the effects of acidic air pollution on sensitive species). If the total acid deposition rate falls above the higher ‘maximum CL’ graph, it is likely that there are harmful effects on the relevant habitat/features arising from the current level of acid (due to both nitrogen and sulphur) deposition. If the total acid deposition level is below the lower ‘minimum CL’ graph, it is unlikely that the feature/habitat is being harmed. If the current total acid (due to both nitrogen and sulphur) deposition level lies between the lower and upper CLFs, it is not possible to be certain that harm is occurring. The CLF graphs for the most sensitive species in each designated area are shown in Vol 2 Appendix 2.2 Plates 1 to 5.

Vol 2 Appendix 2.1 Table 25: Ecological sites within 10km of the Application Site

Site and designation	APIS ID	Most sensitive feature/habitat	Critical Load (N kg/ha/yr)	Nitrogen deposition (N kg/ha/yr)	Acidity critical loads (N/S keq/ha/yr)
Chingford Reservoirs SSSI	1001912	Neutral grassland (Anas clypeata - Shoveler)	20 - 30	19.78	MinCLminN: 0.223 MaxCLminN: 0.438 MinCLMaxS: 0.910 MaxCLMaxS: 4.160 MinCLMaxN: 1.133 MaxCLMaxN: 4.598
Epping Forest SSSI	1001814	Acid grassland (Festuca Ovina - Agrostis Capillaris - Rumex Acetosella Grassland)	8 - 15	17.41	MinCLminN: 0.223 MaxCLminN: 0.438 MinCLMaxS: 0.870 MaxCLMaxS: 4.150 MinCLMaxN: 1.130 MaxCLMaxN: 4.445
Epping Forest SAC	UK0012720	Dwarf shrub heath (Northern Atlantic wet heaths with Erica tetralix [H4010])	10 - 20	17.31	MinCLminN: 0.714 MaxCLminN: 0.892 MinCLMaxS: 0.880 MaxCLMaxS: 1.660 MinCLMaxN: 1.594 MaxCLMaxN: 2.374
Walthamstowe Reservoirs SSSI	1004304	Neutral grassland (Anas clypeata - Shoveler)	20 - 30	19.13	MinCLminN: 0.438 MaxCLminN: 0.438 MinCLMaxS: 0.880 MaxCLMaxS: 4.130 MinCLMaxN: 1.318 MaxCLMaxN: 4.568
Lee Valley SPA/Ramsar	UK9012111	Fen, marsh and swamp (Botaurus stellaris (Europe - breeding) - Great bittern [A021])	15 - 30	18.41	MinCLminN: 0.223 MaxCLminN: 0.438 MinCLMaxS: 0.880 MaxCLMaxS: 4.160 MinCLMaxN: 1.113 MaxCLMaxN: 4.598

1.6.52 The dry deposition flux for each receptor location has been calculated based on recommended deposition velocities as shown in Vol 2 Appendix 2.1 Table 26.

Vol 2 Appendix 2.1 Table 26: Recommended dry deposition velocities

Chemical species	Recommended deposition velocity, m/s	
NO_2	Grassland	0.0015
	Forest	0.003
SO_2	Grassland	0.012
	Forest	0.024
NH_3	Grassland	0.02
	Forest	0.03
HCL	Grassland	0.025
	Forest	0.06

1.6.53 Conversion factors are used to convert dry deposition flux from units $\mu g/m^3$ /m^2/s to kg/ha/yr are shown in Vol 2 Appendix 2.1 Table 27.

Vol 2 Appendix 2.1 Table 27: Conversion factors to alter units from $\mu g/m^3$ of chemical species Xm^2/s to kg of N or S ha/yr

Chemical species	Conversion factor µg m^2/s of species X to kg/ha/year	
NO_2	of N:	96
SO_2	of S:	157.7
NH_3	of N:	259.7

1.6.54 The unit of ‘equivalents’ is also used for acidification purposes, rather than a unit of mass. Essentially it means ‘moles of charge’ i.e. it is a measure of how acidifying the chemical species can be. It is denoted by ‘keq’.

1.6.55 To convert kg/ha/yr to keq/ha/yr multiply the deposition flux by the conversion factors shown in Vol 2 Appendix 2.1 Table 27.

Vol 2 Appendix 2.1 Table 28: Conversion factors to alter units from kg of N or S ha/yr to keq of N or S ha/ya

Species	Conversion factor kg/ha/year to keq/ha/year
N	0.071428
S	0.0625

1.6.56 Wet deposition has not been considered in this assessment as it is not significant within a short range.

1.6.57 The concentrations predicted at ecological sites have been based upon a NO_x emission rate of 80mg/Nm^3 which is a conservative assumption. Emission rates of SO_2 have been assumed to be the same as currently being emitted from the existing site. This is also a conservative estimate as emissions of SO_2 are expected to reduce.

Fugitive emissions and operational dust

1.6.58 The assessment of uncontrolled releases and operational dust takes account of the planned activities on the Application Site, the duration of those activities, the distance between the Application Site and any

potentially sensitive locations and the direction of any sensitive locations in relation to the prevailing wind direction.

1.6.59 The assessment takes into account potential exposure everywhere beyond the Application Site boundary and does not focus only on the receptors shown in Vol 2 Figure 2.7.

Plume visibility

1.6.60 Plume visibility from the stack can depend on ambient meteorological conditions, flue gas humidity and the efflux temperature of the stack. A visible plume is formed when the temperature of the ambient air mixed with the cleaned flue gas, is lower than the saturation temperature of the water vapour emitted with flue gas. The ERF is likely to generate a visible plume for some periods of the year, and this has been modelled and quantified using the ADMS 5 dispersion model.

1.6.61 Plume visibility has been examined for both the flue gas technology options and the existing plant.

1.6.62 As noted, there are no standards for visible plume lengths; for this study, the frequency of visible plume lengths up to 3,000m has been examined.

Odour

1.6.63 A qualitative assessment has been undertaken to assess the potential risk of odour nuisance emissions from the proposed ERF using the FIDOR methodology. The methodology for the assessment of operational odour nuisance is the same as that described for the construction odour assessment and is provided in Paragraphs 1.5.30 to 1.5.35.

1.6.64 The FIDOR factors are all considered to determine the level of risk of odour nuisance (low, medium or high risk) using professional judgement.

Human health

1.6.65 The HHRA (Vol 2 Appendix 2.3 of the ES (AD06.02)) considers the effects of human exposure from emissions to air from the existing EfW facility, the transition period (Stage 2), and final operational scenario for the ERF (Stage 3/4). A cumulative scenario is also considered which assesses the operation of the ERF with the previous operation of the existing EfW facility. This is required as the existing EfW facility has operated for over 40 years and as a consequence will have operated prior to the introduction of stricter controls on emissions from municipal waste incinerators in 1996. Therefore it is necessary to consider historical exposure to dioxins in combination with the exposure from the proposed ERF.

1.6.66 The HHRA (Vol 2 Appendix 2.3 of the ES (AD06.02)) utilises output from the air dispersion modelling results to assess the potential risk to human health from exposure to air emissions from the proposed ERF. The HHRA uses the output from the dispersion model, as annual average ground level concentrations and annual average deposition rates to ground, to assess human exposure to substances emitted to air from the ERF. The annual average ground level concentration is the mean concentration over a year to which a person may be exposed at ground level. The annual

average deposition rate is the mean transfer of contaminants from the air to ground surfaces.

1.6.67 For the HHRA (Vol 2 Appendix 2.3 of the ES (AD06.02)) the worst-case wet ERF FGT option has been assessed, as a precautionary assumption, which was selected based on average air quality modelled results.

1.6.68 The emissions from the ERF would contain a number of substances that cannot be evaluated in terms of their effects on human health simply by reference to ambient air quality standards. Health effects could occur through exposure routes other than purely inhalation. As such, an assessment needs to be made of the overall human exposure to the substances by the local population and then the risk that this exposure causes. The principal focus of the HHRA (Vol 2 Appendix 2.3 (AD06.02)) is to assess risks to health from alternative exposure routes other than inhalation (direct as well as indirect).

1.6.69 The assessment considered the impact of certain substances released by the ERF on the health of the local population at the point of maximum exposure. These substances are those that are 'persistent' in the environment and have several pathways from the point of release to the human receptor. These are substances that can accumulate in soil and other media and which have potentially chronic (long-term) health effects. Other substances for which health effects arise from direct inhalation exposure (e.g. NO_2, SO_2, PM_{10}, $PM_{2.5}$ etc) have been considered in the air quality assessment by comparison with air quality standards and objectives set for the protection of human health. Therefore, the substances considered for the HHRA are essentially dioxins/furans, dioxin-like polychlorinated biphenyls (PCBs) and metals.

1.6.70 Unlike substances such as NO_2, which have potential short-term, acute effects on the respiratory system, dioxins/furans, dioxin-like PCBs and trace metals have the potential to cause effects through long-term, cumulative exposure. A lifetime is the conventional period over which such effects are evaluated. A lifetime is taken to be 70 years.

1.6.71 The exposure scenarios used represent a highly unrealistic situation in which all exposure assumptions are chosen to represent a worst-case and should be treated as an extreme view of the risks to health. While individual high end exposure estimates may represent actual exposure possibilities (albeit at very low frequency), the possibility of all high end exposure assumptions accumulating in one individual is, for practical purposes, never realised. Therefore, intakes presented here should be regarded as an extreme upper estimate of the actual exposure that would be experienced by the real population in the locality.

1.6.72 The risk assessment process for dioxins/furans, dioxin-like PCBs and metals is based on the application of the US Environmental Protection Agency (EPA) Human Health Risk Assessment Protocol (HHRAP). This protocol has been assembled into a commercially available model, Industrial Risk Assessment Program (Version 3.2). The protocol has been specifically developed for assessing health risks arising from exposure to air emissions from industrial facilities. There is no comparable model

which has been developed for the UK situation; a methodology was developed by the former Her Majesty's Inspectorate of Pollution (HMIP) in 1996 but does not include for the assessment of dioxin-like PCBs.

1.6.73 The approach seeks to quantify the hazard faced by the receptor, the exposure of the receptor to the substances identified as being a potential hazard and then to assess the risk of the exposure, as follows:

a. *Quantification of the exposure:* an exposure evaluation determines the dose and intake of key indicator chemicals for an exposed person. The dose is defined as the amount of a substance contacting body boundaries (in the case of inhalation, the lungs) and intake is the amount of the substance absorbed into the body. The evaluation is based upon worst-case, conservative scenarios, with respect to the following:

    1. location of the exposed individual and duration of exposure;
    2. exposure rate;
    3. emission rate from the source.

b. *Risk characterisation:* following the above steps, the risk is characterised by examining the toxicity of the chemicals to which the individual has been exposed, and evaluating the significance of the calculated dose in the context of probabilistic risk.

Exposure routes

1.6.74 There are two primary exposure 'routes' where humans may come into contact with chemicals that may be of concern:

a. direct, via inhalation; or

b. indirect, via ingestion of water, soil, vegetation and animals and animal products that become contaminated through the food chain.

1.6.75 In addition, the Industrial Risk Assessment Program model also considers the ingestion of water where there is a surface drinking water supply that could be contaminated by emissions from the facility. Other pathways of less importance and which are excluded from the assessment include dermal contact with water and/or soil. Dermal contact is an insignificant exposure pathway on the basis of the infrequent and sporadic nature of the events and the very low dermal absorption factors for this exposure route.

1.6.76 The ingestion of drinking water from surface water sources is only considered a potential exposure pathway where there is a local surface water body which provides local drinking water. There are a number of large reservoirs to the south of the Application Site which are part of the Walthamstow Reservoir system which supplies drinking water to London and are owned and managed by Thames Water. However, it is considered that drinking water from a reservoir located close to this type of facility makes a very small contribution to the total exposure. Therefore, exposure via drinking water is generally only considered where there is the potential for exposure via the ingestion of fish and the presence of

edible fish farms (e.g. trout or salmon farms). Therefore, for the purposes of this EIA, exposure via drinking water has been excluded.

1.6.77 There are ten individual reservoirs that make up the Walthamstow Reservoir system; some of these are Sites of Special Scientific Interest (SSSI). These reservoirs are used for fly-fishing and for coarse fishing[45]. Only three of the reservoirs are used for fly-fishing, the closest of which is 3.5km to the south. Fishing permits limit the number of fish that can be caught per season.

1.6.78 Seven of the reservoirs are used for coarse fishing but coarse fish are not generally consumed in the UK although it is noted that some types of coarse fish may be eaten by some groups. In addition, it is against Thames Water's regulations for fishing at Walthamstow Reservoirs for coarse fish to be taken. Therefore, coarse fish from reservoirs in close proximity to the Facility would not be consumed.

1.6.79 Given the proximity of the fly-fishing reservoirs from the Application Site and the limit on edible fish that can be taken it is considered that the diet of local residents is unlikely to be regularly supplemented with fish potentially contaminated with emissions from the Application Site. Therefore, fish receptors have been excluded from the assessment.

1.6.80 Consequently, the exposures arising from ingestion are assessed with reference to the following:

a. milk from home-reared cows;
b. eggs from home-reared chickens;
c. home-reared beef;
d. home-reared pork;
e. home-reared chicken;
f. home-grown vegetable and fruit produce;
g. breastmilk; and
h. soil (incidental).

Compounds of Potential Concern (COPCs)

1.6.81 The substances which have been considered in the assessment are referred to as the COPCs. The substances that have been included for this assessment are those that are authorised emissions and which are included in the EPA HHRAP COPC database for the assessment of long-term health effects. Therefore, the following have been considered as COPCs for the proposed facility:

a. Polychlorinated dibenzodioxin / dibenzofuran (individual congeners) and dioxin-like PCBs;
b. benzo(a)pyrene (PAH);
c. Sb;

[45] Angling for coarse fish which are those types of freshwater fish other than game fish (trout, salmon and char)

d. As;

e. Cd;

f. Cr, trivalent and hexavalent;

g. Hg;

h. Pb; and

i. Ni.

1.6.82 The 2005 protocol excludes Ti by virtue of there being no reference dose, reference concentration or cancer slope factor for Ti. The cancer slope factor is a measure of the health risk associated with exposure to potential carcinogens. It has units of the inverse of milligrammes per kilogramme of bodyweight per day (mg kg^{-1} d^{-1})$^{-1}$. It provides the lifetime risk for exposure to an average daily dose (mg kg^{-1} d^{-1}). The lack of a cancer slope factor is at variance with the draft 1998 protocol which did include Ti in the assessment of hazards. The toxic properties of Ti are well known and it is our opinion that Ti should be included in the assessment of hazards. Therefore, the 1998 US EPA reference data has been used to assess the hazards associated with exposure to Ti.

Assessment criteria

1.6.83 The impact of emissions on human health for the exposure pathways considered has been assessed by comparison to the following:

a. The non-carcinogenic risk is assessed in terms of the Hazard Quotient which is the Average Daily Dose divided by the reference dose or reference concentration. The Hazard Index (HI) is the sum of the individual COPC/pathway Hazard Quotients and assumes that there are no synergistic or antagonist health effects arising from the release. The smaller the HI, the less risk to human health is implied. A HI of less than unity (1.0) implies that such an exposure would not create an adverse non carcinogenic health effect.

b. The carcinogenic risk is a measure of the extra lifetime risk associated with the total dose resulting from exposure to the ERF emissions. The risk is assessed from the application of carcinogenic slope factors and unit factors to the ingestion dose and inhalation dose, respectively. The total lifetime risk is compared to a level that is considered to be acceptable in the UK of if 7.0 x 10^{-5} (equivalent to an annual risk of 1 x 10^{-6} or 1 in a million)[46].

c. For dioxins/furans and dioxin-like PCBs, the total dose is also compared to the WHO's tolerable daily intake (TDI) for dioxins/furans of 1 to 4 pg I-TEQ kg-BW^{-1} d^{-1} (picogrammes as the International Toxic Equivalent per kilogram bodyweight per day). Comparison is also made to the Committee on Toxicity (COT) TDI of 2 pg I-TEQ kg-BW^{-1} d^{-1} for dioxins, furans and dioxin-like PCBs.

[46] CIWEM (2001) Risk Assessment for Environmental Professionals, CIWEM Publication.

Significance criteria

Combustion source emissions

1.6.84 Annex F of the EA H1 Guidance[19] document gives advice on assessing the impact of releases to air from listed activities, and notes that process contributions to air can be considered insignificant if:

a. the long-term process contribution is <1 per cent of the long-term environmental standard; and

b. the short-term process contribution is <10 per cent of the short-term environmental standard.

1.6.85 If the process contributions are greater than these criteria a further assessment is required to determine if the impacts are significant. Such further assessment is undertaken using the approach developed by EPUK/IAQM[2].

1.6.86 The 2015 EPUK/IAQM guidance provides an approach to determining the air quality impacts resulting from a proposed development on local air quality at individual receptors and the overall significance of local air quality effects arising from a proposed development. The guidance notes that impacts are best described in relation to whether or not an air quality objective will not be met, or is at risk of not being met. An exceedence of the objective value is likely to be considered as being significant.

1.6.87 To determine the degree of an impact, the magnitude of incremental change as a proportion of a relevant assessment level (or air quality objective) is examined at each of the assessed receptors, in relation to the new total concentration with the proposed development in place.

1.6.88 The change in concentration is then examined in relation to the predicted total pollutant concentrations in the assessment year and its relationship with the relevant annual mean air quality objective.

1.6.89 Where there is a decrease in pollutant concentrations as a result of the proposed development predicted total pollutant concentration in the 'without development' scenario should be considered, where there is an increase the predicted total pollutant concentration in the 'with development' scenario should be considered. This approach is outlined in Vol 2 Appendix 2.1 Table 29.

1.6.90 For the discrete receptors, the impact descriptors at each of the receptors can be used as a starting point to making a judgement on the overall significance of effect of a proposed development, however other influences would also need to accounted for, such as:

a. the existing and future air quality in the absence of the development;

b. the extent of current and future population exposure to the impacts; and

c. the influence and validity of any assumptions adopted when undertaking the prediction of impacts.

1.6.91 Professional judgement is used to determine the overall significance of effect of the proposed development, however in circumstances where the

proposed development can be judged in isolation, it is likely that a 'moderate' or 'substantial' impact would give rise to a significant effect and a 'negligible' or 'slight' impact would not result in a significant effect.

1.6.92 To assess the ERF contribution to airborne concentrations at the point of maximum impact, the maximum process contribution result from the 10km by 10km gridded result for all pollutants has been compared to the relevant air quality standard or assessment criteria. This uses the EPUK/IAQM percentage change in concentrations relative to annual mean air quality standard criteria (<1 per cent, 2-5 per cent, 6-10 per cent and >10 per cent) for all pollutants, as outlined in Vol 2 Appendix 2.1 Table 29. It is likely that a 'medium' or 'large' percentage change would give rise to a significant effect and an 'imperceptible' or 'small' percentage change would not result in a significant effect.

Vol 2 Appendix 2.1 Table 29: Impact descriptors for pollutant concentrations

Annual average concentrations at receptor in the assessment year	***Per cent change in concentrations relative to annual mean air quality standard***			
	Imperceptible	**Small**	**Medium**	**Large**
	<1 per cent	**2-5 per cent**	**6-10 per cent**	**>10 per cent**
75 per cent or less of objective	Negligible	Negligible	Slight	Moderate
76-94 per cent of objective	Negligible	Slight	Moderate	Moderate
95-102 per cent of objective	Slight	Moderate	Moderate	Substantial
103-109 per cent of objective	Moderate	Moderate	Substantial	Substantial
110 per cent of more of objective	Moderate	Substantial	Substantial	Substantial

Note: Changes in pollutant concentrations of less than 0 per cent i.e. <0.5 per cent would be described as negligible.

1.6.93 For trace metals, the EA has produced guidance[47] which outlines the percentage of each metal in the sum of nine metals emissions, and the effective emission concentration for CrVI, which have been derived from measurements at existing plant between 2007 and 2009. The mean percentages of each metal in the sum of nine metals, and the effective CrVI emission concentration, as outlined in the guidance, have been used to predict the likely realistic process results for trace metals.

1.6.94 The relevant mean percentages specified in the guidance are Arsenic: 0.14 per cent, Chromium: 2.2 per cent, and Nickel: 4.4 per cent. There is no percentage outlined for Cadmium, and a worst case percentage of 11 per cent has been assumed, as outlined in the guidance.

Ecology

1.6.95 For ecological sites the H1 test set out in Paragraphs 1.6.84-1.6.85 has been used. Significance of impacts upon sensitive ecosystems needs to

[47] Environment Agency (2012) Releases from municipal waste incinerators: Guidance to applicants on impact assessment for group 3 metals stack.

be provided by ecologists. The overall significance of the Project upon sensitive ecosystems is detailed within the ecology section (Vol 2 Section 5).

Fugitive emissions

1.6.96 Significance of any potential fugitive emissions is assessed based on professional judgement, considering the risk of these emissions creating either nuisance or elevated pollution concentrations at relevant receptor locations. A low risk is considered not significant. Anything higher is considered as significant. The risk is determined based on the method described in Paragraphs 1.6.58-1.6.59.

Cooling towers

1.6.97 Cooling towers do not emit any harmful pollutants and consequently no further assessment is required.

Plume visibility

1.6.98 There is no guidance available from an air quality perspective for the assessment of significance of a visible plume. Plume visibility for the stack is modelled in terms of the size and frequency of the plume. This information is assessed in visual terms in Vol 3 Visual.

Odour

1.6.99 The significance of any odour emissions from the Application Site is based on professional judgement based on the FIDOR. A low risk of odour nuisance is considered to be not significant. Anything higher is considered as significant. Any improvements are considered a beneficial effect and are considered not significant.

Human health

1.6.100 For air quality impacts, significance is assessed by firstly describing the impacts and then assessing the significance of the impact, as outlined in the EPUK/IAQM guidance.

1.6.101 The guidance is not directly applicable to assessing the significance of human health impacts but has been used to develop some criteria for determining appropriate impact descriptors. The current EPUK/IAQM guidance provides impact descriptors based on the total exposure to airborne pollutants (e.g. background concentration plus development contribution).

1.6.102 As it is not possible to determine the background HI or carcinogenic risk then the approach is not transferable to the assessment of non-carcinogenic or carcinogenic risks. Therefore, for these measures the following has been used based on the guidance:

a. HI or carcinogenic risk that is <1 per cent of the relevant criteria (i.e. HI less than 0.01, lifetime risk less than 7×10^{-7}) is described as negligible and assessed as not significant;

b. HI or carcinogenic risk that is between 2 per cent and 5 per cent of the relevant criteria is described as a slight impact and assessed as not significant;

c. HI or carcinogenic risk that is between 6 per cent and 10 per cent of the relevant criteria is described as a moderate impact and assessed as significant; and

d. HI or carcinogenic risk that is greater than 10 per cent of the relevant criteria is described as a substantial impact criteria (i.e. HI greater than 0.1, lifetime risk greater than 7×10^{-6}) is described as a substantial impact and assessed as significant.

1.6.103 For comparison with the COT TDI, a similar approach is taken for air quality with the contribution of the facility to total intake determined as follows:

a. predicted incremental intake due to emissions from the ERF;

b. average daily background intake (i.e. that arising from other sources), referred to as the mean daily intake, and is derived from data provided by the EA[48];

c. the total intake (i.e. the sum of the predicted incremental intake and the Mean Daily Intake); and

d. a comparison of the total intake with the COT TDI for dioxin/furans.

1.6.104 The impact can then be described according to the guidance provided by EPUK/IAQM in relation to the change in dose relative to the COT TDI and the total exposure relative to the COT TDI (see Vol 2 Appendix 2.1 Table 29).

Vol 2 Appendix 2.1 Table 30: Impact descriptors for exposure dose

Total dose at receptor in the assessment year	***Per cent change in dose relative to the COT TDI***			
	Imperceptible	**Small**	**Medium**	**Large**
	<1 per cent	**2-5 per cent**	**6-10 per cent**	**>10 per cent**
75 per cent or less of COT TDI	Negligible	Negligible	Slight	Moderate
76-94 per cent of COT TDI	Negligible	Slight	Moderate	Moderate
95-102 per cent of the COT TDI	Slight	Moderate	Moderate	Substantial
103-109 per cent of the COT TDI	Moderate	Moderate	Substantial	Substantial
110 per cent of more of the COT TDI	Moderate	Substantial	Substantial	Substantial

Note: Changes in exposure of less than 0 per cent i.e. <0.5 per cent would be described as negligible.

1.6.105 Where the risk is determined be negligible or slight, the overall significance of the Project would likely be not significant. Where the

[48] Environment Agency (2009) Soil Guideline Values for dioxins, furans and dioxin-like PCBs in soil, Science Report SC050021/Dioxins SGV.

significance is deemed to be moderate or substantial the overall significance would likely be significant. This is assessed using professional judgement.

1.7 Decommissioning effects

1.7.1 It is considered that any decommissioning effects would be of a similar nature or less, to those identified in the demolition/construction assessment, as such the outcomes of the construction assessment (for Stages 1-3) are considered applicable to decommissioning of the ERF facility.

1.8 Cumulative effects

Traffic emissions

1.8.1 Cumulative traffic emissions for have been assessed in the same manner as for the core assessment where total generated traffic (construction and operational) is considered for each Project stage, using the EPUK/IAQM and DMRB guidance.

Construction

1.8.2 Cumulative effects have been assessed for the construction of the Project. The effects have been taken into account through a review of construction activities associated with the other committed developments to consider, based on professional judgement, whether this would change the significance of effects identified in the core construction dust assessment.

Operation

1.8.3 Cumulative effects have been assessed for the operational stage of the Project. Developments within 10km of the Application Site have been identified and any proposed combustion sources have been included in the cumulative assessment for the operational stage.

1.8.4 Cumulative effects have been assessed in the same manner as for the operational assessment, and significance determined using the EPUK/IAQM guidance, as outlined in Paragraphs 1.6.79 to 1.6.88.

NORTH LONDON WASTE AUTHORITY

NORTH LONDON HEAT AND POWER PROJECT

ENVIRONMENTAL STATEMENT: VOLUME 2 APPENDIX 2.2 AIR QUALITY MODELLING RESULTS

AD06 . 02

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north london waste authority

North London Waste Authority

North London Heat and Power Project

Environmental Statement Volume 2 Appendix 2.2 Air Quality Modelling Results

AD06.02

The Planning Act 2008 The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5 (2)(a)

Issue

October 2015

Arup

ARUP

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Volume 2 Appendix 2.2 Air Quality Modelling Results

1.1.1 This appendix presents the results from the air quality modelling carried out for the existing energy from waste (EfW) facility, the wet and wet with reheat flue gas treatment (FGT) technology options for the energy recovery facility (ERF) and the diesel generators.

1.1.2 Pollutant results are presented at discrete receptor locations, and include local background concentrations, significance and the process contribution from the EfW facility or ERF as required. For the cumulative NO_2 results, these include peak annual average NO_2 impacts of 5µg/m^3 from the Kedco waste wood combined heat and power (CHP) facility.

1.1.3 With reference to the development stages of the Project, operational effects have been assessed for all stages as follows:

a. Stage 1 is the construction of the ERF, and has assessed existing EfW facility emissions.

b. Stage 2 is the transition period between the EfW facility and ERF, and has assessed stack emissions from the EfW facility and ERF, for the two FGT options and diesel generator emissions.

c. Stage 3 is the demolition of the EfW facility and operation of the ERF, and has assessed the ERF stack emissions, for the two FGT options, and diesel generator emissions.

d. Stage 4 is the ongoing operation of the ERF, and emissions will be the same as those assessed for Stage 3.

1.1.4 The following tables and charts are presented in this appendix:

a. Vol 2 Appendix 2.2 Table 1 - Short-term (hourly average) NO_2 concentrations and significance at discrete receptors, for all stages.

b. Vol 2 Appendix 2.2 Table 2 - Long-term (annual average) NO_2 concentrations and significance at discrete receptors, for all stages.

c. Vol 2 Appendix 2.2 Table 3 - Cumulative long-term (annual average) NO_2 concentrations and significance at discrete receptors, for all stages.

d. Vol 2 Appendix 2.2 Table 4 - Long-term (annual average) CO concentrations and significance at discrete receptors, for all stages.

e. Vol 2 Appendix 2.2 Table 5 - Long-term (annual average) benzene concentrations and significance at discrete receptors, for all stages.

f. Vol 2 Appendix 2.2 Table 6 - Long-term (annual average) NH_3 concentrations and significance at discrete receptors, for all stages.

g. Vol 2 Appendix 2.2 Table 7 - Long-term (annual average) PM_{10} (and $PM_{2.5}$) concentrations and significance at discrete receptors, for all stages.

h. Vol 2 Appendix 2.2 Table 8 - Long-term (annual average) HCl concentrations at discrete receptors, for all stages.

i. Vol 2 Appendix 2.2 Table 9 - Long-term (annual average) SO_2 concentrations and significance at discrete receptors, for all stages.

j. Vol 2 Appendix 2.2 Table 10 - Long-term (annual average) Benzo(a)Pyrene concentrations and significance at discrete receptors, for all stages.

k. Vol 2 Appendix 2.2 Table 11 - Long-term (annual average) Cd concentrations and significance at discrete receptors, for all stages.

l. Vol 2 Appendix 2.2 Table 12 - Long-term (annual average) Hg concentrations and significance at discrete receptors, for all stages.

m. Vol 2 Appendix 2.2 Table 13 - Long-term (annual average) As concentrations and significance at discrete receptors, for all stages.

n. Vol 2 Appendix 2.2 Table 14 - Long-term (annual average) Pb concentrations and significance at discrete receptors, for all stages.

o. Vol 2 Appendix 2.2 Table 15 - Long-term (annual average) Ni concentrations and significance at discrete receptors, for all stages.

p. Vol 2 Appendix 2.2 Table 16 - Long-term (annual average) Sb concentrations and significance at discrete receptors, for all stages.

q. Vol 2 Appendix 2.2 Table 17 - Long-term (annual average) Cr concentrations and significance at discrete receptors, for all stages.

r. Vol 2 Appendix 2.2 Table 18 - Long-term (annual average) Co concentrations and significance at discrete receptors, for all stages.

s. Vol 2 Appendix 2.2 Table 19 - Long-term (annual average) Cu concentrations and significance at discrete receptors, for all stages.

t. Vol 2 Appendix 2.2 Table 20 - Long-term (annual average) Mn concentrations and significance at discrete receptors, for all stages.

u. Vol 2 Appendix 2.2 Table 21 - Long-term (annual average) V concentrations and significance at discrete receptors, for all stages.

v. Vol 2 Appendix 2.2 Table 22 - Long-term (annual average) dioxin and furan concentrations at discrete receptors, for all stages.

w. Vol 2 Appendix 2.2 Table 23 - Long-term process contributions for HF and Tl at discrete receptors, for all stages.

x. Plates Vol 2 Appendix 2.2 Plate 1 to Vol 2 Appendix 2.2 Plate 5 - Acidity critical load charts for ecological receptors.

y. Vol 2 Appendix 2.2 Table 24 - Predicted NO_X concentrations at ecological receptors and comparison with the critical level, for existing EfW facility and transition (Stages 1 and 2).

z. Vol 2 Appendix 2.2 Table 25- Predicted NO_X concentrations at ecological receptors and comparison with the critical level, for operation (Stages 3/4).

aa. Vol 2 Appendix 2.2 Table 26 - Predicted SO_2 concentrations at ecological receptors and comparison with the critical level, for existing EfW facility and transition (Stages 1 and 2).

bb. Vol 2 Appendix 2.2 Table 27- Predicted SO_2 concentrations at ecological receptors and comparison with the critical level, for operation (Stages 3/4).

cc. Plates Vol 2 Appendix 2.2 Plate 6 to Vol 2 Appendix 2.2 Plate 10 - NO_X/SO_2 critical load charts for ecological receptors, for existing EfW facility (Stage 1).

dd. Plates Vol 2 Appendix 2.2 Plate 11 to Vol 2 Appendix 2.2 Plate 15 - NO_X/SO_2 critical load charts for ecological receptors, for transition (Stage 2).

ee. Plates Vol 2 Appendix 2.2 Plate 16 to Vol 2 Appendix 2.2 Plate 20 - NO_X/SO_2 critical load charts for ecological receptors, for operation (Stages 3/4) for wet FGT.

ff. Plates Vol 2 Appendix 2.2 Plate 21 to Vol 2 Appendix 2.2 Plate 25 - NO_X/SO_2 critical load charts for ecological receptors, for operation (Stages 3/4) for wet with reheat FGT.

Vol 2 Appendix 2.2 Table 1: Short-term (hourly average) NO_2 concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Hourly average NO_2 concentration (µg/m^3)					Significance of hourly average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	61.3	66.5	65.6	60.4	59.8	Negligible	Negligible	Negligible	Negligible
2	536390	192542	61.9	66.7	66.0	60.2	59.8	Negligible	Negligible	Negligible	Negligible
3	536478	192261	61.9	65.4	64.7	59.2	58.7	Negligible	Negligible	Negligible	Negligible
4	536431	192162	61.8	65.3	64.6	59.1	58.7	Negligible	Negligible	Negligible	Negligible
5	536531	192719	62.0	65.9	65.3	59.6	59.2	Negligible	Negligible	Negligible	Negligible
6	536681	192949	62.0	65.4	64.8	59.3	58.9	Negligible	Negligible	Negligible	Negligible
7	536789	192022	61.0	63.4	62.9	58.2	57.9	Negligible	Negligible	Negligible	Negligible
8	536789	192251	61.1	64.1	63.7	58.5	58.3	Negligible	Negligible	Negligible	Negligible
9	536800	192666	61.6	64.6	64.1	58.7	58.4	Negligible	Negligible	Negligible	Negligible
10	536925	192994	61.1	63.8	63.4	58.6	58.3	Negligible	Negligible	Negligible	Negligible
11	536821	193220	53.2	55.9	55.4	50.7	50.4	Negligible	Negligible	Negligible	Negligible
12	536908	193495	52.5	55.0	54.5	50.5	50.2	Negligible	Negligible	Negligible	Negligible
13	537217	193203	51.9	54.0	53.6	49.7	49.5	Negligible	Negligible	Negligible	Negligible
14	534923	191311	56.7	58.3	58.1	54.5	54.3	Negligible	Negligible	Negligible	Negligible
15	536880	192494	61.5	64.3	63.8	58.5	58.2	Negligible	Negligible	Negligible	Negligible
16	534904	192337	66.8	69.6	68.7	63.7	63.2	Negligible	Negligible	Negligible	Negligible
17	534958	192523	67.3	70.6	69.6	64.5	63.8	Negligible	Negligible	Negligible	Negligible
18	535101	192578	71.6	74.9	73.7	68.8	68.0	Negligible	Negligible	Negligible	Negligible
19	535116	192710	70.5	74.9	73.5	69.6	68.7	Negligible	Negligible	Negligible	Negligible
20	535084	192863	71.1	77.2	75.7	70.6	69.6	Negligible	Negligible	Negligible	Negligible
21	535069	192998	70.6	76.7	75.3	69.9	69.0	Negligible	Negligible	Negligible	Negligible
22	534702	192985	65.9	70.1	69.5	64.1	63.7	Negligible	Negligible	Negligible	Negligible
23	534494	192820	65.6	68.9	68.4	64.0	63.6	Negligible	Negligible	Negligible	Negligible
24	534463	192404	65.7	68.4	67.7	63.5	63.1	Negligible	Negligible	Negligible	Negligible
25	535137	193250	59.7	66.6	65.6	59.8	59.1	Negligible	Negligible	Negligible	Negligible
26	535440	193285	59.7	67.7	66.5	60.7	59.9	Negligible	Negligible	Negligible	Negligible
27	535483	193418	59.7	66.8	65.9	59.9	59.3	Negligible	Negligible	Negligible	Negligible
28	535532	193615	59.5	65.1	64.4	58.6	58.1	Negligible	Negligible	Negligible	Negligible
29	534672	193307	55.9	59.7	59.1	54.1	53.7	Negligible	Negligible	Negligible	Negligible
30	534848	193615	55.5	59.9	59.3	54.5	54.1	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Hourly average NO_2 concentration ($\mu g/m^3$)					Significance of hourly average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
31	535109	193782	58.6	63.0	62.7	57.6	57.4	Negligible	Negligible	Negligible	Negligible
32	535348	193899	58.6	62.7	62.3	57.4	57.1	Negligible	Negligible	Negligible	Negligible
33	535289	193329	59.2	67.2	66.3	60.5	59.9	Negligible	Negligible	Negligible	Negligible
34	535774	193917	58.6	61.6	60.9	56.6	56.1	Negligible	Negligible	Negligible	Negligible
35	535975	193888	58.8	62.2	61.3	56.8	56.3	Negligible	Negligible	Negligible	Negligible
36	535048	192151	70.2	72.8	72.1	67.3	66.9	Negligible	Negligible	Negligible	Negligible
37	535108	192015	69.9	72.7	72.1	67.2	66.8	Negligible	Negligible	Negligible	Negligible
38	535499	191989	58.1	61.4	60.5	55.9	55.3	Negligible	Negligible	Negligible	Negligible
39	535673	191965	58.8	62.3	61.3	56.1	55.4	Negligible	Negligible	Negligible	Negligible
40	535743	191924	58.7	62.3	61.5	56.1	55.6	Negligible	Negligible	Negligible	Negligible
41	535866	191864	58.9	62.2	61.6	55.9	55.5	Negligible	Negligible	Negligible	Negligible
42	535954	191647	58.6	61.2	60.6	55.4	55.1	Negligible	Negligible	Negligible	Negligible
43	534991	192230	66.5	69.3	68.2	63.4	62.7	Negligible	Negligible	Negligible	Negligible
44	534883	192033	65.9	68.3	67.5	63.0	62.5	Negligible	Negligible	Negligible	Negligible
45	534799	191902	57.9	60.1	59.5	55.3	54.8	Negligible	Negligible	Negligible	Negligible
46	534813	191648	57.1	59.2	58.8	55.0	54.7	Negligible	Negligible	Negligible	Negligible
47	534820	191439	56.7	58.5	58.2	54.7	54.4	Negligible	Negligible	Negligible	Negligible
48	534785	191044	56.2	57.7	57.3	54.3	54.1	Negligible	Negligible	Negligible	Negligible
49	535877	191031	56.7	58.4	58.0	54.6	54.3	Negligible	Negligible	Negligible	Negligible
50	535781	190813	57.7	59.3	58.9	55.7	55.5	Negligible	Negligible	Negligible	Negligible
51	536190	191057	60.4	62.2	61.8	58.4	58.1	Negligible	Negligible	Negligible	Negligible
52	536543	191108	60.3	62.0	61.6	58.3	58.0	Negligible	Negligible	Negligible	Negligible
53	535964	190902	57.8	59.4	59.0	55.8	55.6	Negligible	Negligible	Negligible	Negligible
54	535731	194625	51.9	53.9	53.5	50.4	50.2	Negligible	Negligible	Negligible	Negligible
55	534858	194334	50.2	53.0	52.7	49.5	49.3	Negligible	Negligible	Negligible	Negligible
56	534050	193710	54.1	56.5	56.1	52.8	52.6	Negligible	Negligible	Negligible	Negligible
57	533242	192667	61.0	62.7	62.3	59.3	59.0	Negligible	Negligible	Negligible	Negligible
58	532942	193649	52.5	53.9	53.6	50.7	50.5	Negligible	Negligible	Negligible	Negligible
59	533487	194593	50.9	52.8	52.4	50.4	50.1	Negligible	Negligible	Negligible	Negligible
60	534092	195241	50.4	52.0	51.7	49.6	49.5	Negligible	Negligible	Negligible	Negligible
61	535712	195583	48.4	49.7	49.5	47.4	47.2	Negligible	Negligible	Negligible	Negligible
62	537328	194146	49.1	50.9	50.5	47.8	47.5	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Hourly average NO_2 concentration ($\mu g/m^3$)					Significance of hourly average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
63	537769	193667	50.7	52.3	52.0	49.1	48.9	Negligible	Negligible	Negligible	Negligible
64	537887	193127	50.5	52.0	51.8	49.0	48.8	Negligible	Negligible	Negligible	Negligible
65	537868	192357	53.8	55.6	55.3	52.2	52.0	Negligible	Negligible	Negligible	Negligible
66	537868	194945	48.6	49.9	49.8	47.2	47.1	Negligible	Negligible	Negligible	Negligible
67	538234	194470	47.6	49.0	48.6	46.3	46.0	Negligible	Negligible	Negligible	Negligible
68	538582	193743	49.2	50.4	50.1	47.4	47.2	Negligible	Negligible	Negligible	Negligible
69	538859	192695	49.8	51.0	50.8	48.7	48.6	Negligible	Negligible	Negligible	Negligible
70	537746	192000	54.0	55.8	55.4	52.3	52.0	Negligible	Negligible	Negligible	Negligible
71	537563	191423	61.1	62.7	62.2	59.4	59.1	Negligible	Negligible	Negligible	Negligible
72	537290	190671	59.5	61.0	60.7	58.1	58.0	Negligible	Negligible	Negligible	Negligible
73	536027	190164	53.7	55.0	54.6	52.4	52.2	Negligible	Negligible	Negligible	Negligible
74	536938	189896	56.2	57.3	57.1	55.2	55.0	Negligible	Negligible	Negligible	Negligible
75	535938	189488	56.9	58.0	57.8	55.7	55.6	Negligible	Negligible	Negligible	Negligible
76	537962	190521	59.0	60.3	60.0	57.9	57.7	Negligible	Negligible	Negligible	Negligible
77	538352	191263	55.0	56.5	56.2	53.7	53.5	Negligible	Negligible	Negligible	Negligible
78	538685	192418	50.0	51.3	51.0	48.8	48.7	Negligible	Negligible	Negligible	Negligible
79	534675	190549	58.4	59.6	59.4	57.0	56.8	Negligible	Negligible	Negligible	Negligible
80	533951	191028	56.0	57.3	57.0	54.6	54.4	Negligible	Negligible	Negligible	Negligible
81	533895	191855	58.3	60.3	59.4	55.6	55.1	Negligible	Negligible	Negligible	Negligible
82	533843	192259	61.6	64.2	63.4	60.1	59.6	Negligible	Negligible	Negligible	Negligible
83	533017	192315	61.2	63.2	62.8	59.4	59.1	Negligible	Negligible	Negligible	Negligible
84	532801	191780	57.6	59.7	59.2	55.4	55.0	Negligible	Negligible	Negligible	Negligible
85	533336	191385	58.0	59.4	58.7	54.9	54.5	Negligible	Negligible	Negligible	Negligible
86	533458	190512	61.4	62.4	62.3	60.3	60.2	Negligible	Negligible	Negligible	Negligible
87	534238	190267	58.1	59.2	59.0	56.8	56.7	Negligible	Negligible	Negligible	Negligible
88	533980	189845	64.5	65.5	65.4	63.5	63.4	Negligible	Negligible	Negligible	Negligible
89	537511	192655	54.5	56.4	56.1	52.6	52.4	Negligible	Negligible	Negligible	Negligible
90	534361	194275	50.0	52.5	52.1	49.2	48.9	Negligible	Negligible	Negligible	Negligible
91	535048	194871	51.2	53.3	53.0	50.3	50.2	Negligible	Negligible	Negligible	Negligible
92	535557	191578	58.5	60.8	60.2	55.2	54.8	Negligible	Negligible	Negligible	Negligible
93	534953	191953	57.9	60.5	59.8	55.4	54.9	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	53.5	56.3	54.8	51.7	50.7	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Hourly average NO_2 concentration ($\mu g/m^3$)					Significance of hourly average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E2	536179	193231	54.3	57.9	56.5	51.8	50.9	Negligible	Negligible	Negligible	Negligible
E3	536273	193493	53.7	57.1	56.1	51.2	50.6	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	62.2	67.4	66.1	60.9	60.1	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	62.6	66.9	66.1	60.1	59.6	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	47.6	49.0	48.6	46.3	46.1	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	42.6	43.9	43.4	40.6	40.2	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	44.5	45.7	45.6	43.2	43.1	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	46.6	47.6	47.5	45.2	45.1	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	48.6	49.8	49.6	47.6	47.4	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	64.5	65.8	65.7	63.5	63.4	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	57.6	59.1	58.8	55.7	55.5	Negligible	Negligible	Negligible	Negligible
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Vol 2 Appendix 2.2 Table 2: Long-term (annual average) NO_2 concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average NO_2 concentration ($\mu g/m^3$)					Significance of annual average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	27.8	28.0	27.9	27.8	27.8	Negligible	Negligible	Negligible	Negligible
2	536390	192542	27.9	28.1	28.0	27.9	27.8	Negligible	Negligible	Negligible	Negligible
3	536478	192261	27.9	27.9	27.9	27.8	27.7	Negligible	Negligible	Negligible	Negligible
4	536431	192162	27.8	27.9	27.8	27.7	27.7	Negligible	Negligible	Negligible	Negligible
5	536531	192719	28.2	28.3	28.2	28.0	27.9	Negligible	Negligible	Negligible	Negligible
6	536681	192949	28.6	28.4	28.4	28.0	27.9	Negligible	Negligible	Negligible	Negligible
7	536789	192022	27.8	27.8	27.8	27.7	27.7	Negligible	Negligible	Negligible	Negligible
8	536789	192251	27.9	27.9	27.9	27.8	27.7	Negligible	Negligible	Negligible	Negligible
9	536800	192666	28.1	28.2	28.1	27.9	27.8	Negligible	Negligible	Negligible	Negligible
10	536925	192994	28.5	28.4	28.3	27.9	27.9	Negligible	Negligible	Negligible	Negligible
11	536821	193220	24.6	24.6	24.5	24.2	24.1	Negligible	Negligible	Negligible	Negligible
12	536908	193495	24.4	24.6	24.5	24.2	24.1	Negligible	Negligible	Negligible	Negligible
13	537217	193203	24.4	24.3	24.2	23.8	23.8	Negligible	Negligible	Negligible	Negligible
14	534923	191311	26.2	26.2	26.1	26.1	26.1	Negligible	Negligible	Negligible	Negligible
15	536880	192494	28.0	28.1	28.0	27.8	27.8	Negligible	Negligible	Negligible	Negligible
16	534904	192337	30.1	30.0	30.0	29.9	29.9	Negligible	Negligible	Negligible	Negligible
17	534958	192523	30.2	30.1	30.0	30.0	29.9	Negligible	Negligible	Negligible	Negligible
18	535101	192578	32.2	32.1	32.1	32.1	32.1	Negligible	Negligible	Negligible	Negligible
19	535116	192710	32.2	32.2	32.1	32.2	32.2	Negligible	Negligible	Negligible	Negligible
20	535084	192863	32.1	32.4	32.3	32.4	32.3	Negligible	Negligible	Negligible	Negligible
21	535069	192998	32.0	32.4	32.3	32.3	32.2	Negligible	Negligible	Negligible	Negligible
22	534702	192985	30.0	30.3	30.2	30.1	30.1	Negligible	Negligible	Negligible	Negligible
23	534494	192820	30.2	30.3	30.2	30.1	30.1	Negligible	Negligible	Negligible	Negligible
24	534463	192404	30.2	30.1	30.1	30.0	29.9	Negligible	Negligible	Negligible	Negligible
25	535137	193250	26.8	27.0	26.9	26.9	26.9	Negligible	Negligible	Negligible	Negligible
26	535440	193285	26.8	27.1	27.0	27.0	26.9	Negligible	Negligible	Negligible	Negligible
27	535483	193418	26.8	27.1	27.0	26.9	26.9	Negligible	Negligible	Negligible	Negligible
28	535532	193615	26.9	27.0	27.0	26.9	26.8	Negligible	Negligible	Negligible	Negligible
29	534672	193307	25.2	25.4	25.3	25.3	25.2	Negligible	Negligible	Negligible	Negligible
30	534848	193615	25.2	25.4	25.3	25.2	25.2	Negligible	Negligible	Negligible	Negligible
31	535109	193782	26.8	27.0	26.9	26.8	26.8	Negligible	Negligible	Negligible	Negligible
32	535348	193899	26.8	27.0	26.9	26.8	26.8	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average NO_2 concentration (µg/m^3)					Significance of annual average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
33	535289	193329	26.8	27.1	27.0	26.9	26.9	Negligible	Negligible	Negligible	Negligible
34	535774	193917	26.9	27.0	26.9	26.8	26.8	Negligible	Negligible	Negligible	Negligible
35	535975	193888	27.0	27.1	27.1	26.9	26.9	Negligible	Negligible	Negligible	Negligible
36	535048	192151	32.1	32.1	32.0	32.0	32.0	Negligible	Negligible	Negligible	Negligible
37	535108	192015	32.0	32.1	32.0	32.0	32.0	Negligible	Negligible	Negligible	Negligible
38	535499	191989	26.2	26.2	26.2	26.2	26.1	Negligible	Negligible	Negligible	Negligible
39	535673	191965	26.2	26.2	26.2	26.2	26.1	Negligible	Negligible	Negligible	Negligible
40	535743	191924	26.2	26.2	26.2	26.2	26.1	Negligible	Negligible	Negligible	Negligible
41	535866	191864	26.2	26.3	26.2	26.2	26.2	Negligible	Negligible	Negligible	Negligible
42	535954	191647	26.2	26.3	26.2	26.2	26.1	Negligible	Negligible	Negligible	Negligible
43	534991	192230	30.0	30.0	29.9	29.9	29.9	Negligible	Negligible	Negligible	Negligible
44	534883	192033	29.9	29.9	29.9	29.9	29.9	Negligible	Negligible	Negligible	Negligible
45	534799	191902	26.2	26.2	26.1	26.1	26.1	Negligible	Negligible	Negligible	Negligible
46	534813	191648	26.1	26.2	26.1	26.1	26.1	Negligible	Negligible	Negligible	Negligible
47	534820	191439	26.1	26.2	26.1	26.1	26.1	Negligible	Negligible	Negligible	Negligible
48	534785	191044	26.1	26.1	26.1	26.1	26.1	Negligible	Negligible	Negligible	Negligible
49	535877	191031	26.2	26.2	26.2	26.1	26.1	Negligible	Negligible	Negligible	Negligible
50	535781	190813	26.8	26.8	26.8	26.8	26.8	Negligible	Negligible	Negligible	Negligible
51	536190	191057	28.0	28.1	28.0	28.0	28.0	Negligible	Negligible	Negligible	Negligible
52	536543	191108	28.1	28.1	28.0	28.0	28.0	Negligible	Negligible	Negligible	Negligible
53	535964	190902	26.8	26.8	26.8	26.8	26.8	Negligible	Negligible	Negligible	Negligible
54	535731	194625	24.3	24.3	24.3	24.2	24.2	Negligible	Negligible	Negligible	Negligible
55	534858	194334	23.4	23.5	23.5	23.4	23.4	Negligible	Negligible	Negligible	Negligible
56	534050	193710	25.2	25.2	25.2	25.2	25.1	Negligible	Negligible	Negligible	Negligible
57	533242	192667	28.7	28.7	28.7	28.6	28.6	Negligible	Negligible	Negligible	Negligible
58	532942	193649	24.5	24.5	24.5	24.5	24.5	Negligible	Negligible	Negligible	Negligible
59	533487	194593	24.3	24.3	24.3	24.3	24.2	Negligible	Negligible	Negligible	Negligible
60	534092	195241	24.1	24.1	24.1	24.0	24.0	Negligible	Negligible	Negligible	Negligible
61	535712	195583	23.0	23.0	23.0	23.0	22.9	Negligible	Negligible	Negligible	Negligible
62	537328	194146	23.2	23.2	23.2	23.0	22.9	Negligible	Negligible	Negligible	Negligible
63	537769	193667	24.1	24.2	24.1	23.8	23.8	Negligible	Negligible	Negligible	Negligible
64	537887	193127	24.0	23.9	23.9	23.7	23.6	Negligible	Negligible	Negligible	Negligible
65	537868	192357	25.3	25.3	25.3	25.1	25.1	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average NO_2 concentration (µg/m^3)					Significance of annual average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
66	537868	194945	23.0	23.1	23.0	22.9	22.8	Negligible	Negligible	Negligible	Negligible
67	538234	194470	22.6	22.7	22.6	22.5	22.4	Negligible	Negligible	Negligible	Negligible
68	538582	193743	23.4	23.3	23.3	23.1	23.0	Negligible	Negligible	Negligible	Negligible
69	538859	192695	23.8	23.8	23.8	23.7	23.7	Negligible	Negligible	Negligible	Negligible
70	537746	192000	25.3	25.3	25.2	25.1	25.1	Negligible	Negligible	Negligible	Negligible
71	537563	191423	28.9	28.9	28.8	28.8	28.8	Negligible	Negligible	Negligible	Negligible
72	537290	190671	28.3	28.3	28.3	28.2	28.2	Negligible	Negligible	Negligible	Negligible
73	536027	190164	25.4	25.4	25.4	25.3	25.3	Negligible	Negligible	Negligible	Negligible
74	536938	189896	26.9	26.9	26.9	26.8	26.8	Negligible	Negligible	Negligible	Negligible
75	535938	189488	27.2	27.2	27.2	27.1	27.1	Negligible	Negligible	Negligible	Negligible
76	537962	190521	28.2	28.2	28.2	28.2	28.2	Negligible	Negligible	Negligible	Negligible
77	538352	191263	26.0	26.1	26.0	26.0	26.0	Negligible	Negligible	Negligible	Negligible
78	538685	192418	23.8	23.8	23.8	23.7	23.7	Negligible	Negligible	Negligible	Negligible
79	534675	190549	27.7	27.7	27.7	27.6	27.6	Negligible	Negligible	Negligible	Negligible
80	533951	191028	26.4	26.4	26.4	26.4	26.4	Negligible	Negligible	Negligible	Negligible
81	533895	191855	26.5	26.5	26.5	26.4	26.4	Negligible	Negligible	Negligible	Negligible
82	533843	192259	28.7	28.7	28.7	28.6	28.5	Negligible	Negligible	Negligible	Negligible
83	533017	192315	28.7	28.7	28.6	28.5	28.5	Negligible	Negligible	Negligible	Negligible
84	532801	191780	26.5	26.5	26.5	26.4	26.4	Negligible	Negligible	Negligible	Negligible
85	533336	191385	26.5	26.5	26.4	26.4	26.4	Negligible	Negligible	Negligible	Negligible
86	533458	190512	29.5	29.5	29.4	29.4	29.4	Negligible	Negligible	Negligible	Negligible
87	534238	190267	27.7	27.7	27.7	27.6	27.6	Negligible	Negligible	Negligible	Negligible
88	533980	189845	31.1	31.1	31.1	31.1	31.1	Negligible	Negligible	Negligible	Negligible
89	537511	192655	25.4	25.4	25.4	25.2	25.2	Negligible	Negligible	Negligible	Negligible
90	534361	194275	23.4	23.5	23.4	23.4	23.4	Negligible	Negligible	Negligible	Negligible
91	535048	194871	24.2	24.2	24.2	24.1	24.1	Negligible	Negligible	Negligible	Negligible
92	535557	191578	26.2	26.2	26.2	26.1	26.1	Negligible	Negligible	Negligible	Negligible
93	534953	191953	26.2	26.2	26.1	26.1	26.1	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	23.9	24.0	24.0	24.3	24.2	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	24.2	24.2	24.2	24.2	24.1	Negligible	Negligible	Negligible	Negligible
E3	536273	193493	24.3	24.3	24.3	24.1	24.1	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	28.2	28.3	28.2	28.1	28.0	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	28.4	28.4	28.3	28.0	28.0	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average NO_2 concentration (µg/m^3)					Significance of annual average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E6	538006	194754	22.6	22.6	22.6	22.4	22.4	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	19.7	19.7	19.6	19.5	19.5	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	21.2	21.2	21.2	21.0	21.0	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	22.3	22.2	22.2	22.1	22.0	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	23.3	23.3	23.2	23.1	23.1	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	31.0	31.0	31.0	31.0	31.0	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	26.8	26.8	26.8	26.8	26.8	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**40**					**-**			

Vol 2 Appendix 2.2 Table 3: Cumulative long-term (annual average) NO_2 concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Cumulative annual average NO_2 concentration (µg/m^3)					Significance of cumulative annual average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	32.8	33.0	32.9	32.8	32.8	Negligible	Negligible	Negligible	Negligible
2	536390	192542	32.9	33.1	33.0	32.9	32.8	Negligible	Negligible	Negligible	Negligible
3	536478	192261	32.9	32.9	32.9	32.8	32.7	Negligible	Negligible	Negligible	Negligible
4	536431	192162	32.8	32.9	32.8	32.7	32.7	Negligible	Negligible	Negligible	Negligible
5	536531	192719	33.2	33.3	33.2	33.0	32.9	Negligible	Negligible	Negligible	Negligible
6	536681	192949	33.6	33.4	33.4	33.0	32.9	Negligible	Negligible	Negligible	Negligible
7	536789	192022	32.8	32.8	32.8	32.7	32.7	Negligible	Negligible	Negligible	Negligible
8	536789	192251	32.9	32.9	32.9	32.8	32.7	Negligible	Negligible	Negligible	Negligible
9	536800	192666	33.1	33.2	33.1	32.9	32.8	Negligible	Negligible	Negligible	Negligible
10	536925	192994	33.5	33.4	33.3	32.9	32.9	Negligible	Negligible	Negligible	Negligible
11	536821	193220	29.6	29.6	29.5	29.2	29.1	Negligible	Negligible	Negligible	Negligible
12	536908	193495	29.4	29.6	29.5	29.2	29.1	Negligible	Negligible	Negligible	Negligible
13	537217	193203	29.4	29.3	29.2	28.8	28.8	Negligible	Negligible	Negligible	Negligible
14	534923	191311	31.2	31.2	31.1	31.1	31.1	Negligible	Negligible	Negligible	Negligible
15	536880	192494	33.0	33.1	33.0	32.8	32.8	Negligible	Negligible	Negligible	Negligible
16	534904	192337	35.1	35.0	35.0	34.9	34.9	Negligible	Negligible	Negligible	Negligible
17	534958	192523	35.2	35.1	35.0	35.0	34.9	Negligible	Negligible	Negligible	Negligible
18	535101	192578	37.2	37.1	37.1	37.1	37.1	Negligible	Negligible	Negligible	Negligible
19	535116	192710	37.2	37.2	37.1	37.2	37.2	Negligible	Negligible	Negligible	Negligible
20	535084	192863	37.1	37.4	37.3	37.4	37.3	Negligible	Negligible	Negligible	Negligible
21	535069	192998	37.0	37.4	37.3	37.3	37.2	Negligible	Negligible	Negligible	Negligible
22	534702	192985	35.0	35.3	35.2	35.1	35.1	Negligible	Negligible	Negligible	Negligible
23	534494	192820	35.2	35.3	35.2	35.1	35.1	Negligible	Negligible	Negligible	Negligible
24	534463	192404	35.2	35.1	35.1	35.0	34.9	Negligible	Negligible	Negligible	Negligible
25	535137	193250	31.8	32.0	31.9	31.9	31.9	Negligible	Negligible	Negligible	Negligible
26	535440	193285	31.8	32.1	32.0	32.0	31.9	Negligible	Negligible	Negligible	Negligible
27	535483	193418	31.8	32.1	32.0	31.9	31.9	Negligible	Negligible	Negligible	Negligible
28	535532	193615	31.9	32.0	32.0	31.9	31.8	Negligible	Negligible	Negligible	Negligible
29	534672	193307	30.2	30.4	30.3	30.3	30.2	Negligible	Negligible	Negligible	Negligible
30	534848	193615	30.2	30.4	30.3	30.2	30.2	Negligible	Negligible	Negligible	Negligible
31	535109	193782	31.8	32.0	31.9	31.8	31.8	Negligible	Negligible	Negligible	Negligible
32	535348	193899	31.8	32.0	31.9	31.8	31.8	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Cumulative annual average NO_2 concentration ($\mu g/m^3$)					Significance of cumulative annual average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
33	535289	193329	31.8	32.1	32.0	31.9	31.9	Negligible	Negligible	Negligible	Negligible
34	535774	193917	31.9	32.0	31.9	31.8	31.8	Negligible	Negligible	Negligible	Negligible
35	535975	193888	32.0	32.1	32.1	31.9	31.9	Negligible	Negligible	Negligible	Negligible
36	535048	192151	37.1	37.1	37.0	37.0	37.0	Negligible	Negligible	Negligible	Negligible
37	535108	192015	37.0	37.1	37.0	37.0	37.0	Negligible	Negligible	Negligible	Negligible
38	535499	191989	31.2	31.2	31.2	31.2	31.1	Negligible	Negligible	Negligible	Negligible
39	535673	191965	31.2	31.2	31.2	31.2	31.1	Negligible	Negligible	Negligible	Negligible
40	535743	191924	31.2	31.2	31.2	31.2	31.1	Negligible	Negligible	Negligible	Negligible
41	535866	191864	31.2	31.3	31.2	31.2	31.2	Negligible	Negligible	Negligible	Negligible
42	535954	191647	31.2	31.3	31.2	31.2	31.1	Negligible	Negligible	Negligible	Negligible
43	534991	192230	35.0	35.0	34.9	34.9	34.9	Negligible	Negligible	Negligible	Negligible
44	534883	192033	34.9	34.9	34.9	34.9	34.9	Negligible	Negligible	Negligible	Negligible
45	534799	191902	31.2	31.2	31.1	31.1	31.1	Negligible	Negligible	Negligible	Negligible
46	534813	191648	31.1	31.2	31.1	31.1	31.1	Negligible	Negligible	Negligible	Negligible
47	534820	191439	31.1	31.2	31.1	31.1	31.1	Negligible	Negligible	Negligible	Negligible
48	534785	191044	31.1	31.1	31.1	31.1	31.1	Negligible	Negligible	Negligible	Negligible
49	535877	191031	31.2	31.2	31.2	31.1	31.1	Negligible	Negligible	Negligible	Negligible
50	535781	190813	31.8	31.8	31.8	31.8	31.8	Negligible	Negligible	Negligible	Negligible
51	536190	191057	33.0	33.1	33.0	33.0	33.0	Negligible	Negligible	Negligible	Negligible
52	536543	191108	33.1	33.1	33.0	33.0	33.0	Negligible	Negligible	Negligible	Negligible
53	535964	190902	31.8	31.8	31.8	31.8	31.8	Negligible	Negligible	Negligible	Negligible
54	535731	194625	29.3	29.3	29.3	29.2	29.2	Negligible	Negligible	Negligible	Negligible
55	534858	194334	28.4	28.5	28.5	28.4	28.4	Negligible	Negligible	Negligible	Negligible
56	534050	193710	30.2	30.2	30.2	30.2	30.1	Negligible	Negligible	Negligible	Negligible
57	533242	192667	33.7	33.7	33.7	33.6	33.6	Negligible	Negligible	Negligible	Negligible
58	532942	193649	29.5	29.5	29.5	29.5	29.5	Negligible	Negligible	Negligible	Negligible
59	533487	194593	29.3	29.3	29.3	29.3	29.2	Negligible	Negligible	Negligible	Negligible
60	534092	195241	29.1	29.1	29.1	29.0	29.0	Negligible	Negligible	Negligible	Negligible
61	535712	195583	28.0	28.0	28.0	28.0	27.9	Negligible	Negligible	Negligible	Negligible
62	537328	194146	28.2	28.2	28.2	28.0	27.9	Negligible	Negligible	Negligible	Negligible
63	537769	193667	29.1	29.2	29.1	28.8	28.8	Negligible	Negligible	Negligible	Negligible
64	537887	193127	29.0	28.9	28.9	28.7	28.6	Negligible	Negligible	Negligible	Negligible
65	537868	192357	30.3	30.3	30.3	30.1	30.1	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Cumulative annual average NO_2 concentration ($\mu g/m^3$)					Significance of cumulative annual average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
66	537868	194945	28.0	28.1	28.0	27.9	27.8	Negligible	Negligible	Negligible	Negligible
67	538234	194470	27.6	27.7	27.6	27.5	27.4	Negligible	Negligible	Negligible	Negligible
68	538582	193743	28.4	28.3	28.3	28.1	28.0	Negligible	Negligible	Negligible	Negligible
69	538859	192695	28.8	28.8	28.8	28.7	28.7	Negligible	Negligible	Negligible	Negligible
70	537746	192000	30.3	30.3	30.2	30.1	30.1	Negligible	Negligible	Negligible	Negligible
71	537563	191423	33.9	33.9	33.8	33.8	33.8	Negligible	Negligible	Negligible	Negligible
72	537290	190671	33.3	33.3	33.3	33.2	33.2	Negligible	Negligible	Negligible	Negligible
73	536027	190164	30.4	30.4	30.4	30.3	30.3	Negligible	Negligible	Negligible	Negligible
74	536938	189896	31.9	31.9	31.9	31.8	31.8	Negligible	Negligible	Negligible	Negligible
75	535938	189488	32.2	32.2	32.2	32.1	32.1	Negligible	Negligible	Negligible	Negligible
76	537962	190521	33.2	33.2	33.2	33.2	33.2	Negligible	Negligible	Negligible	Negligible
77	538352	191263	31.0	31.1	31.0	31.0	31.0	Negligible	Negligible	Negligible	Negligible
78	538685	192418	28.8	28.8	28.8	28.7	28.7	Negligible	Negligible	Negligible	Negligible
79	534675	190549	32.7	32.7	32.7	32.6	32.6	Negligible	Negligible	Negligible	Negligible
80	533951	191028	31.4	31.4	31.4	31.4	31.4	Negligible	Negligible	Negligible	Negligible
81	533895	191855	31.5	31.5	31.5	31.4	31.4	Negligible	Negligible	Negligible	Negligible
82	533843	192259	33.7	33.7	33.7	33.6	33.5	Negligible	Negligible	Negligible	Negligible
83	533017	192315	33.7	33.7	33.6	33.5	33.5	Negligible	Negligible	Negligible	Negligible
84	532801	191780	31.5	31.5	31.5	31.4	31.4	Negligible	Negligible	Negligible	Negligible
85	533336	191385	31.5	31.5	31.4	31.4	31.4	Negligible	Negligible	Negligible	Negligible
86	533458	190512	34.5	34.5	34.4	34.4	34.4	Negligible	Negligible	Negligible	Negligible
87	534238	190267	32.7	32.7	32.7	32.6	32.6	Negligible	Negligible	Negligible	Negligible
88	533980	189845	36.1	36.1	36.1	36.1	36.1	Negligible	Negligible	Negligible	Negligible
89	537511	192655	30.4	30.4	30.4	30.2	30.2	Negligible	Negligible	Negligible	Negligible
90	534361	194275	28.4	28.5	28.4	28.4	28.4	Negligible	Negligible	Negligible	Negligible
91	535048	194871	29.2	29.2	29.2	29.1	29.1	Negligible	Negligible	Negligible	Negligible
92	535557	191578	31.2	31.2	31.2	31.1	31.1	Negligible	Negligible	Negligible	Negligible
93	534953	191953	31.2	31.2	31.1	31.1	31.1	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	28.9	29.0	29.0	29.3	29.2	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	29.2	29.2	29.2	29.2	29.1	Negligible	Negligible	Negligible	Negligible
E3	536273	193493	29.3	29.3	29.3	29.1	29.1	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	33.2	33.3	33.2	33.1	33.0	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	33.4	33.4	33.3	33.0	33.0	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Cumulative annual average NO_2 concentration ($\mu g/m^3$)					Significance of cumulative annual average NO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E6	538006	194754	27.6	27.6	27.6	27.4	27.4	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	24.7	24.7	24.6	24.5	24.5	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	26.2	26.2	26.2	26.0	26.0	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	27.3	27.2	27.2	27.1	27.0	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	28.3	28.3	28.2	28.1	28.1	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	36.0	36.0	36.0	36.0	36.0	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	31.8	31.8	31.8	31.8	31.8	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**40**					**-**			

Vol 2 Appendix 2.2 Table 4: Long-term (annual average) CO concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average CO concentration (µg/m^3)					Significance of annual average CO concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.28	0.35	0.33	0.37	0.33	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.30	0.38	0.37	0.41	0.36	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.28	0.34	0.32	0.34	0.31	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.27	0.32	0.31	0.33	0.30	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.37	0.48	0.46	0.48	0.43	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.47	0.57	0.55	0.47	0.43	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.27	0.32	0.31	0.30	0.28	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.30	0.35	0.34	0.34	0.31	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.36	0.45	0.43	0.43	0.39	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.46	0.55	0.53	0.44	0.41	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.45	0.59	0.57	0.55	0.50	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.39	0.55	0.52	0.57	0.52	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.43	0.53	0.52	0.45	0.42	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.33	0.40	0.39	0.39	0.36	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.29	0.32	0.31	0.28	0.26	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.31	0.35	0.34	0.30	0.27	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.31	0.33	0.32	0.29	0.27	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.29	0.34	0.33	0.34	0.30	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.27	0.39	0.36	0.48	0.42	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.26	0.39	0.36	0.49	0.43	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.28	0.39	0.37	0.47	0.42	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.31	0.41	0.39	0.43	0.39	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.32	0.36	0.35	0.32	0.29	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.24	0.32	0.31	0.38	0.34	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.24	0.35	0.33	0.44	0.39	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.25	0.34	0.33	0.41	0.38	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.26	0.33	0.32	0.37	0.34	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.25	0.31	0.30	0.35	0.32	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.25	0.30	0.29	0.34	0.31	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.25	0.32	0.31	0.36	0.33	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average CO concentration (µg/m^3)					Significance of annual average CO concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.25	0.32	0.31	0.35	0.33	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.25	0.34	0.33	0.42	0.38	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.28	0.34	0.33	0.34	0.31	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.30	0.38	0.37	0.39	0.36	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.26	0.29	0.28	0.28	0.27	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.26	0.29	0.28	0.29	0.27	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.25	0.28	0.27	0.29	0.27	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.25	0.29	0.28	0.30	0.28	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.25	0.29	0.28	0.30	0.28	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.26	0.30	0.29	0.31	0.29	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.26	0.30	0.29	0.30	0.28	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.26	0.29	0.28	0.27	0.25	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.25	0.28	0.27	0.27	0.25	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.26	0.28	0.28	0.27	0.26	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.25	0.27	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.25	0.27	0.27	0.27	0.25	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.25	0.28	0.28	0.27	0.26	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.25	0.30	0.29	0.30	0.28	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.24	0.28	0.27	0.29	0.28	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.24	0.27	0.26	0.28	0.27	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.29	0.33	0.33	0.33	0.31	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.24	0.27	0.27	0.28	0.27	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.23	0.25	0.24	0.25	0.25	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.22	0.24	0.24	0.25	0.24	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.23	0.26	0.25	0.26	0.25	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.32	0.41	0.39	0.40	0.37	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.37	0.47	0.46	0.45	0.42	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average CO concentration (µg/m^3)					Significance of annual average CO concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.34	0.39	0.39	0.34	0.32	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.28	0.33	0.32	0.31	0.30	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.28	0.34	0.33	0.33	0.31	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.29	0.36	0.35	0.36	0.34	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.33	0.39	0.39	0.36	0.34	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.26	0.29	0.28	0.27	0.27	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.27	0.31	0.30	0.29	0.28	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.25	0.27	0.26	0.26	0.25	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.25	0.26	0.26	0.26	0.25	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.24	0.26	0.25	0.25	0.25	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.24	0.26	0.25	0.25	0.25	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.24	0.26	0.25	0.25	0.25	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.25	0.27	0.26	0.26	0.25	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.26	0.29	0.28	0.28	0.27	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.25	0.27	0.26	0.26	0.25	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.24	0.26	0.26	0.26	0.25	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.27	0.30	0.29	0.28	0.27	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.30	0.33	0.33	0.31	0.29	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.28	0.32	0.31	0.30	0.28	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.27	0.29	0.29	0.28	0.27	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.25	0.28	0.27	0.26	0.25	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.24	0.26	0.25	0.25	0.24	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.24	0.26	0.26	0.26	0.25	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.24	0.26	0.26	0.25	0.25	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.31	0.37	0.36	0.34	0.33	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.23	0.27	0.26	0.28	0.26	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.23	0.26	0.26	0.27	0.26	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.26	0.29	0.28	0.28	0.27	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.28	0.34	0.32	0.34	0.30	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.34	0.43	0.41	0.42	0.37	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average CO concentration (µg/m^3)					Significance of annual average CO concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.37	0.48	0.45	0.46	0.41	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.36	0.46	0.44	0.46	0.40	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.42	0.54	0.51	0.49	0.44	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.28	0.34	0.33	0.34	0.31	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.26	0.31	0.30	0.30	0.28	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.28	0.33	0.33	0.32	0.31	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.28	0.32	0.32	0.29	0.28	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.25	0.28	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.24	0.26	0.26	0.26	0.25	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.25	0.27	0.27	0.27	0.26	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**10,000**					**-**			

Vol 2 Appendix 2.2 Table 5: Long-term (annual average) benzene concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average benzene concentration (µg/m^3)					Significance of annual average benzene concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.64	0.65	0.65	0.67	0.66	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.64	0.65	0.65	0.68	0.67	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.64	0.65	0.65	0.66	0.66	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.64	0.65	0.65	0.66	0.65	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.64	0.67	0.67	0.69	0.68	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.64	0.69	0.69	0.69	0.68	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.64	0.65	0.65	0.66	0.65	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.64	0.65	0.65	0.66	0.66	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.64	0.66	0.66	0.68	0.67	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.64	0.68	0.68	0.68	0.68	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.62	0.66	0.66	0.68	0.67	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.61	0.65	0.65	0.69	0.68	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.59	0.63	0.63	0.64	0.63	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.67	0.68	0.68	0.68	0.68	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.64	0.66	0.66	0.67	0.67	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.64	0.66	0.66	0.66	0.65	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.64	0.66	0.66	0.66	0.66	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.64	0.65	0.65	0.65	0.65	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.64	0.65	0.65	0.66	0.65	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.64	0.65	0.65	0.69	0.67	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.64	0.65	0.65	0.69	0.68	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.64	0.66	0.66	0.69	0.69	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.64	0.66	0.66	0.69	0.68	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.64	0.66	0.66	0.66	0.66	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.62	0.63	0.63	0.66	0.65	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.62	0.63	0.63	0.67	0.66	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.62	0.63	0.63	0.66	0.65	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.62	0.63	0.63	0.65	0.65	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.62	0.63	0.63	0.65	0.65	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.62	0.63	0.63	0.65	0.64	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.62	0.63	0.63	0.65	0.65	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average benzene concentration (µg/m^3)					Significance of annual average benzene concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.62	0.63	0.63	0.65	0.64	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.62	0.63	0.63	0.66	0.66	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.62	0.63	0.63	0.65	0.64	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.62	0.64	0.64	0.66	0.65	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.64	0.64	0.64	0.65	0.64	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.64	0.64	0.64	0.65	0.65	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.67	0.68	0.68	0.69	0.69	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.67	0.68	0.68	0.69	0.69	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.67	0.68	0.68	0.69	0.69	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.67	0.68	0.68	0.69	0.69	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.67	0.68	0.68	0.69	0.69	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.64	0.65	0.65	0.65	0.65	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.64	0.65	0.65	0.65	0.65	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.67	0.68	0.68	0.68	0.68	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.67	0.67	0.67	0.68	0.68	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.67	0.67	0.67	0.68	0.68	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.67	0.67	0.67	0.68	0.68	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.67	0.68	0.68	0.69	0.68	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.69	0.70	0.70	0.70	0.70	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.67	0.68	0.68	0.68	0.68	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.67	0.68	0.68	0.68	0.68	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.69	0.70	0.70	0.70	0.70	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.61	0.62	0.62	0.63	0.63	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.62	0.63	0.63	0.64	0.64	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.62	0.63	0.63	0.64	0.63	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.66	0.67	0.67	0.68	0.67	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.63	0.63	0.63	0.64	0.64	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.62	0.62	0.62	0.63	0.62	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.60	0.60	0.60	0.61	0.60	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.58	0.59	0.59	0.60	0.60	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.58	0.60	0.60	0.62	0.61	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.59	0.62	0.62	0.64	0.63	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average benzene concentration (µg/m^3)					Significance of annual average benzene concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.59	0.62	0.62	0.62	0.61	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.62	0.64	0.64	0.64	0.64	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.58	0.59	0.59	0.60	0.60	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.55	0.57	0.57	0.59	0.58	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.57	0.60	0.60	0.61	0.60	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.61	0.62	0.62	0.63	0.63	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.62	0.64	0.64	0.64	0.64	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.65	0.66	0.66	0.66	0.66	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.67	0.67	0.67	0.68	0.68	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.68	0.69	0.69	0.69	0.69	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.69	0.70	0.70	0.70	0.70	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.71	0.71	0.71	0.71	0.71	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.67	0.67	0.67	0.68	0.67	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.64	0.65	0.65	0.65	0.65	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.61	0.62	0.62	0.63	0.63	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.69	0.70	0.70	0.70	0.70	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.68	0.69	0.69	0.69	0.69	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.68	0.69	0.69	0.69	0.69	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.66	0.67	0.67	0.67	0.67	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.66	0.67	0.67	0.67	0.67	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.69	0.70	0.70	0.71	0.70	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.68	0.69	0.69	0.69	0.69	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.70	0.70	0.70	0.71	0.70	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.69	0.70	0.70	0.70	0.70	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.71	0.71	0.71	0.71	0.71	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.62	0.64	0.64	0.65	0.65	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.62	0.63	0.63	0.64	0.63	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.61	0.62	0.62	0.63	0.62	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.67	0.68	0.68	0.69	0.69	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.67	0.68	0.68	0.68	0.68	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.61	0.63	0.63	0.64	0.63	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.61	0.64	0.64	0.66	0.65	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average benzene concentration (µg/m^3)					Significance of annual average benzene concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.61	0.64	0.64	0.66	0.65	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.64	0.67	0.67	0.69	0.67	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.64	0.68	0.68	0.69	0.68	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.55	0.57	0.57	0.58	0.58	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.52	0.54	0.54	0.55	0.54	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.53	0.55	0.55	0.56	0.56	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.57	0.58	0.58	0.59	0.58	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.61	0.62	0.62	0.62	0.62	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.67	0.67	0.67	0.68	0.67	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.69	0.70	0.70	0.70	0.70	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**5**					**-**			

Vol 2 Appendix 2.2 Table 6: Long-term (annual average) NH_3 concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average NH_3 concentration (µg/m^3)					Significance annual average NH_3 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
2	536390	192542	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
3	536478	192261	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
4	536431	192162	3.16	3.16	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
5	536531	192719	3.17	3.17	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
6	536681	192949	3.19	3.17	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
7	536789	192022	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
8	536789	192251	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
9	536800	192666	3.17	3.17	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
10	536925	192994	3.19	3.17	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
11	536821	193220	3.19	3.18	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
12	536908	193495	3.18	3.18	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
13	537217	193203	3.19	3.17	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
14	534923	191311	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
15	536880	192494	3.17	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
16	534904	192337	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
17	534958	192523	3.17	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
18	535101	192578	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
19	535116	192710	3.16	3.16	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
20	535084	192863	3.16	3.17	3.16	3.15	3.15	Moderate adverse	Moderate adverse	Negligible	Negligible
21	535069	192998	3.15	3.17	3.16	3.15	3.15	Substantial adverse	Moderate adverse	Negligible	Negligible
22	534702	192985	3.16	3.17	3.16	3.15	3.15	Moderate adverse	Moderate adverse	Negligible	Negligible
23	534494	192820	3.16	3.17	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
24	534463	192404	3.17	3.16	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
25	535137	193250	3.15	3.16	3.16	3.15	3.15	Moderate adverse	Negligible	Negligible	Negligible
26	535440	193285	3.15	3.17	3.16	3.15	3.15	Moderate adverse	Moderate adverse	Negligible	Negligible

Receptor ID	Grid Reference		Annual average NH_3 concentration (µg/m^3)					Significance annual average NH_3 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
27	535483	193418	3.15	3.16	3.16	3.15	3.15	Moderate adverse	Moderate adverse	Negligible	Negligible
28	535532	193615	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
29	534672	193307	3.15	3.16	3.16	3.15	3.15	Moderate adverse	Negligible	Negligible	Negligible
30	534848	193615	3.15	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
31	535109	193782	3.15	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
32	535348	193899	3.15	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
33	535289	193329	3.15	3.16	3.16	3.15	3.15	Moderate adverse	Moderate adverse	Negligible	Negligible
34	535774	193917	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
35	535975	193888	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
36	535048	192151	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
37	535108	192015	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
38	535499	191989	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
39	535673	191965	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
40	535743	191924	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
41	535866	191864	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
42	535954	191647	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
43	534991	192230	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
44	534883	192033	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
45	534799	191902	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
46	534813	191648	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
47	534820	191439	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
48	534785	191044	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
49	535877	191031	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
50	535781	190813	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
51	536190	191057	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
52	536543	191108	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
53	535964	190902	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
54	535731	194625	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
55	534858	194334	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
56	534050	193710	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average NH_3 concentration (µg/m^3)					Significance annual average NH_3 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
57	533242	192667	3.16	3.16	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
58	532942	193649	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
59	533487	194593	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
60	534092	195241	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
61	535712	195583	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
62	537328	194146	3.17	3.17	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
63	537769	193667	3.18	3.17	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
64	537887	193127	3.17	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
65	537868	192357	3.16	3.16	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
66	537868	194945	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
67	538234	194470	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
68	538582	193743	3.17	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
69	538859	192695	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
70	537746	192000	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
71	537563	191423	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
72	537290	190671	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
73	536027	190164	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
74	536938	189896	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
75	535938	189488	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
76	537962	190521	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
77	538352	191263	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
78	538685	192418	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
79	534675	190549	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
80	533951	191028	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
81	533895	191855	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
82	533843	192259	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
83	533017	192315	3.16	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
84	532801	191780	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
85	533336	191385	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
86	533458	190512	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
87	534238	190267	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
88	533980	189845	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average NH_3 concentration (µg/m^3)					Significance annual average NH_3 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
89	537511	192655	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
90	534361	194275	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
91	535048	194871	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
92	535557	191578	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
93	534953	191953	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	3.16	3.16	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	3.17	3.17	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E3	536273	193493	3.18	3.17	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	3.17	3.17	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	3.18	3.17	3.17	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	3.16	3.16	3.16	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	3.16	3.16	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	3.15	3.15	3.15	3.15	3.15	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**1***					**-**			

*Air quality objective based on critical level for ecosystems dominated by lichens and bryophytes, as a worst case assumption.

Vol 2 Appendix 2.2 Table 7: Long-term (annual average) PM_{10} (and $PM_{2.5}$*) concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average PM_{10} concentration (µg/m^3)					Significance of annual average PM_{10} concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
2	536390	192542	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
3	536478	192261	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
4	536431	192162	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
5	536531	192719	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
6	536681	192949	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
7	536789	192022	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
8	536789	192251	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
9	536800	192666	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
10	536925	192994	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
11	536821	193220	20.2	20.2	20.2	20.2	20.2	Negligible	Negligible	Negligible	Negligible
12	536908	193495	20.2	20.2	20.2	20.2	20.2	Negligible	Negligible	Negligible	Negligible
13	537217	193203	20.1	20.2	20.2	20.2	20.1	Negligible	Negligible	Negligible	Negligible
14	534923	191311	21.0	21.0	21.0	21.0	21.0	Negligible	Negligible	Negligible	Negligible
15	536880	192494	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
16	534904	192337	23.3	23.3	23.3	23.3	23.3	Negligible	Negligible	Negligible	Negligible
17	534958	192523	23.3	23.3	23.3	23.3	23.3	Negligible	Negligible	Negligible	Negligible
18	535101	192578	23.5	23.5	23.5	23.5	23.5	Negligible	Negligible	Negligible	Negligible
19	535116	192710	23.5	23.5	23.5	23.5	23.5	Negligible	Negligible	Negligible	Negligible
20	535084	192863	23.4	23.5	23.5	23.5	23.5	Negligible	Negligible	Negligible	Negligible
21	535069	192998	23.4	23.5	23.5	23.5	23.5	Negligible	Negligible	Negligible	Negligible
22	534702	192985	23.3	23.3	23.3	23.3	23.3	Negligible	Negligible	Negligible	Negligible
23	534494	192820	23.3	23.3	23.3	23.3	23.3	Negligible	Negligible	Negligible	Negligible
24	534463	192404	23.3	23.3	23.3	23.3	23.3	Negligible	Negligible	Negligible	Negligible
25	535137	193250	21.2	21.2	21.2	21.3	21.3	Negligible	Negligible	Negligible	Negligible
26	535440	193285	21.2	21.2	21.2	21.3	21.3	Negligible	Negligible	Negligible	Negligible
27	535483	193418	21.2	21.2	21.2	21.3	21.3	Negligible	Negligible	Negligible	Negligible
28	535532	193615	21.2	21.2	21.2	21.3	21.3	Negligible	Negligible	Negligible	Negligible
29	534672	193307	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
30	534848	193615	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
31	535109	193782	21.2	21.2	21.2	21.3	21.3	Negligible	Negligible	Negligible	Negligible
32	535348	193899	21.2	21.2	21.2	21.3	21.3	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average PM_{10} concentration ($\mu g/m^3$)					Significance of annual average PM_{10} concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
33	535289	193329	21.2	21.2	21.2	21.3	21.3	Negligible	Negligible	Negligible	Negligible
34	535774	193917	21.2	21.2	21.2	21.3	21.2	Negligible	Negligible	Negligible	Negligible
35	535975	193888	21.2	21.2	21.2	21.3	21.3	Negligible	Negligible	Negligible	Negligible
36	535048	192151	23.4	23.5	23.5	23.5	23.5	Negligible	Negligible	Negligible	Negligible
37	535108	192015	23.4	23.5	23.5	23.5	23.5	Negligible	Negligible	Negligible	Negligible
38	535499	191989	21.0	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
39	535673	191965	21.0	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
40	535743	191924	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
41	535866	191864	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
42	535954	191647	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
43	534991	192230	23.3	23.3	23.3	23.3	23.3	Negligible	Negligible	Negligible	Negligible
44	534883	192033	23.3	23.3	23.3	23.3	23.3	Negligible	Negligible	Negligible	Negligible
45	534799	191902	21.0	21.0	21.0	21.0	21.0	Negligible	Negligible	Negligible	Negligible
46	534813	191648	21.0	21.0	21.0	21.0	21.0	Negligible	Negligible	Negligible	Negligible
47	534820	191439	21.0	21.0	21.0	21.0	21.0	Negligible	Negligible	Negligible	Negligible
48	534785	191044	21.0	21.0	21.0	21.0	21.0	Negligible	Negligible	Negligible	Negligible
49	535877	191031	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
50	535781	190813	21.3	21.3	21.3	21.3	21.3	Negligible	Negligible	Negligible	Negligible
51	536190	191057	22.3	22.3	22.3	22.3	22.3	Negligible	Negligible	Negligible	Negligible
52	536543	191108	22.3	22.3	22.3	22.3	22.3	Negligible	Negligible	Negligible	Negligible
53	535964	190902	21.3	21.3	21.3	21.3	21.3	Negligible	Negligible	Negligible	Negligible
54	535731	194625	20.7	20.7	20.7	20.7	20.7	Negligible	Negligible	Negligible	Negligible
55	534858	194334	20.3	20.3	20.3	20.3	20.3	Negligible	Negligible	Negligible	Negligible
56	534050	193710	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
57	533242	192667	22.3	22.3	22.3	22.4	22.3	Negligible	Negligible	Negligible	Negligible
58	532942	193649	20.5	20.5	20.5	20.5	20.5	Negligible	Negligible	Negligible	Negligible
59	533487	194593	20.5	20.5	20.5	20.6	20.6	Negligible	Negligible	Negligible	Negligible
60	534092	195241	20.4	20.4	20.4	20.4	20.4	Negligible	Negligible	Negligible	Negligible
61	535712	195583	20.1	20.1	20.1	20.1	20.1	Negligible	Negligible	Negligible	Negligible
62	537328	194146	20.7	20.7	20.7	20.7	20.7	Negligible	Negligible	Negligible	Negligible
63	537769	193667	20.1	20.1	20.1	20.2	20.1	Negligible	Negligible	Negligible	Negligible
64	537887	193127	20.1	20.1	20.1	20.1	20.1	Negligible	Negligible	Negligible	Negligible
65	537868	192357	20.7	20.7	20.7	20.8	20.7	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average PM_{10} concentration (µg/m^3)					Significance of annual average PM_{10} concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
66	537868	194945	20.7	20.7	20.7	20.7	20.7	Negligible	Negligible	Negligible	Negligible
67	538234	194470	19.7	19.7	19.7	19.8	19.7	Negligible	Negligible	Negligible	Negligible
68	538582	193743	20.0	20.1	20.1	20.1	20.1	Negligible	Negligible	Negligible	Negligible
69	538859	192695	20.0	20.0	20.0	20.0	20.0	Negligible	Negligible	Negligible	Negligible
70	537746	192000	20.7	20.7	20.7	20.7	20.7	Negligible	Negligible	Negligible	Negligible
71	537563	191423	22.4	22.4	22.4	22.4	22.4	Negligible	Negligible	Negligible	Negligible
72	537290	190671	22.4	22.4	22.4	22.4	22.4	Negligible	Negligible	Negligible	Negligible
73	536027	190164	20.8	20.8	20.8	20.8	20.8	Negligible	Negligible	Negligible	Negligible
74	536938	189896	21.5	21.5	21.5	21.5	21.5	Negligible	Negligible	Negligible	Negligible
75	535938	189488	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
76	537962	190521	22.4	22.4	22.4	22.4	22.4	Negligible	Negligible	Negligible	Negligible
77	538352	191263	20.8	20.8	20.8	20.8	20.8	Negligible	Negligible	Negligible	Negligible
78	538685	192418	20.0	20.0	20.0	20.0	20.0	Negligible	Negligible	Negligible	Negligible
79	534675	190549	21.5	21.5	21.5	21.5	21.5	Negligible	Negligible	Negligible	Negligible
80	533951	191028	21.3	21.3	21.3	21.3	21.3	Negligible	Negligible	Negligible	Negligible
81	533895	191855	21.3	21.3	21.3	21.3	21.3	Negligible	Negligible	Negligible	Negligible
82	533843	192259	22.3	22.3	22.3	22.3	22.3	Negligible	Negligible	Negligible	Negligible
83	533017	192315	22.3	22.3	22.3	22.3	22.3	Negligible	Negligible	Negligible	Negligible
84	532801	191780	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
85	533336	191385	21.3	21.3	21.3	21.3	21.3	Negligible	Negligible	Negligible	Negligible
86	533458	190512	22.5	22.5	22.5	22.5	22.5	Negligible	Negligible	Negligible	Negligible
87	534238	190267	21.5	21.5	21.5	21.5	21.5	Negligible	Negligible	Negligible	Negligible
88	533980	189845	22.8	22.9	22.9	22.9	22.9	Negligible	Negligible	Negligible	Negligible
89	537511	192655	20.7	20.8	20.8	20.8	20.8	Negligible	Negligible	Negligible	Negligible
90	534361	194275	20.3	20.3	20.3	20.3	20.3	Negligible	Negligible	Negligible	Negligible
91	535048	194871	20.7	20.7	20.7	20.7	20.7	Negligible	Negligible	Negligible	Negligible
92	535557	191578	21.1	21.1	21.1	21.1	21.1	Negligible	Negligible	Negligible	Negligible
93	534953	191953	21.0	21.0	21.0	21.0	21.0	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	20.2	20.2	20.2	20.2	20.2	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	20.2	20.2	20.2	20.2	20.2	Negligible	Negligible	Negligible	Negligible
E3	536273	193493	20.2	20.2	20.2	20.2	20.2	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	22.0	22.0	22.0	22.0	22.0	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average PM_{10} concentration (µg/m^3)					Significance of annual average PM_{10} concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E6	538006	194754	19.7	19.7	19.7	19.7	19.7	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	18.7	18.7	18.7	18.7	18.7	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	20.0	20.0	20.0	20.0	20.0	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	19.8	19.8	19.8	19.8	19.8	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	20.1	20.1	20.1	20.1	20.1	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	23.3	23.3	23.3	23.3	23.3	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	21.3	21.3	21.3	21.3	21.3	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**40**					**-**			

*As a worst case assessment, concentrations of $PM_{2.5}$ are assumed to be the same as those for PM_{10}. Significance for $PM_{2.5}$ is determined to be negligible for all receptors, based on an air quality standard of 25µg/m^3.

As no there is no assessment level for Hydrogen Chloride (HCl), the significance cannot be derived for the discrete receptors. Concentrations including background are presented below.

Vol 2 Appendix 2.2 Table 8: Long-term (annual average) HCl concentrations at discrete receptors

Receptor ID	Grid Reference		Annual average HCl concentration (µg/m^3)				
			Stage 1	Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.40	0.41	0.41	0.42	0.41
2	536390	192542	0.40	0.42	0.41	0.43	0.42
3	536478	192261	0.40	0.41	0.41	0.41	0.41
4	536431	192162	0.39	0.41	0.40	0.41	0.40
5	536531	192719	0.41	0.43	0.43	0.44	0.43
6	536681	192949	0.43	0.45	0.45	0.44	0.43
7	536789	192022	0.40	0.41	0.40	0.41	0.40
8	536789	192251	0.40	0.41	0.41	0.41	0.41
9	536800	192666	0.41	0.43	0.43	0.43	0.42
10	536925	192994	0.42	0.45	0.45	0.43	0.43
11	536821	193220	0.42	0.46	0.45	0.46	0.45
12	536908	193495	0.42	0.45	0.44	0.46	0.45
13	537217	193203	0.42	0.45	0.44	0.44	0.43
14	534923	191311	0.39	0.40	0.40	0.40	0.39
15	536880	192494	0.40	0.42	0.42	0.42	0.42
16	534904	192337	0.40	0.41	0.40	0.40	0.40
17	534958	192523	0.40	0.41	0.41	0.40	0.40
18	535101	192578	0.40	0.41	0.41	0.40	0.40
19	535116	192710	0.40	0.41	0.41	0.41	0.40
20	535084	192863	0.39	0.41	0.41	0.44	0.42
21	535069	192998	0.39	0.41	0.41	0.44	0.43
22	534702	192985	0.40	0.42	0.41	0.44	0.43
23	534494	192820	0.40	0.42	0.42	0.43	0.42
24	534463	192404	0.40	0.41	0.41	0.41	0.40
25	535137	193250	0.39	0.41	0.40	0.42	0.41
26	535440	193285	0.39	0.41	0.41	0.43	0.42
27	535483	193418	0.39	0.41	0.41	0.43	0.42
28	535532	193615	0.39	0.41	0.41	0.42	0.41
29	534672	193307	0.39	0.40	0.40	0.42	0.41
30	534848	193615	0.39	0.40	0.40	0.41	0.41

Receptor ID	Grid Reference		Annual average HCl concentration (µg/m^3)				
			Stage 1	Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat
31	535109	193782	0.39	0.41	0.40	0.42	0.41
32	535348	193899	0.39	0.41	0.40	0.41	0.41
33	535289	193329	0.39	0.41	0.41	0.43	0.42
34	535774	193917	0.40	0.41	0.41	0.41	0.41
35	535975	193888	0.40	0.42	0.42	0.42	0.42
36	535048	192151	0.39	0.40	0.40	0.40	0.39
37	535108	192015	0.39	0.40	0.40	0.40	0.40
38	535499	191989	0.39	0.40	0.40	0.40	0.40
39	535673	191965	0.39	0.40	0.40	0.40	0.40
40	535743	191924	0.39	0.40	0.40	0.40	0.40
41	535866	191864	0.39	0.40	0.40	0.41	0.40
42	535954	191647	0.39	0.40	0.40	0.40	0.40
43	534991	192230	0.39	0.40	0.40	0.40	0.39
44	534883	192033	0.39	0.40	0.40	0.40	0.39
45	534799	191902	0.39	0.40	0.40	0.40	0.39
46	534813	191648	0.39	0.40	0.40	0.40	0.39
47	534820	191439	0.39	0.40	0.40	0.40	0.39
48	534785	191044	0.39	0.40	0.40	0.40	0.39
49	535877	191031	0.39	0.40	0.40	0.40	0.39
50	535781	190813	0.39	0.40	0.40	0.40	0.39
51	536190	191057	0.39	0.40	0.40	0.40	0.40
52	536543	191108	0.39	0.40	0.40	0.40	0.40
53	535964	190902	0.39	0.40	0.40	0.40	0.39
54	535731	194625	0.39	0.40	0.40	0.40	0.40
55	534858	194334	0.39	0.40	0.40	0.40	0.40
56	534050	193710	0.39	0.40	0.40	0.40	0.40
57	533242	192667	0.40	0.41	0.41	0.41	0.41
58	532942	193649	0.39	0.40	0.40	0.40	0.40
59	533487	194593	0.39	0.39	0.39	0.40	0.39
60	534092	195241	0.39	0.39	0.39	0.40	0.39
61	535712	195583	0.39	0.40	0.40	0.40	0.40
62	537328	194146	0.41	0.42	0.42	0.43	0.42
63	537769	193667	0.41	0.44	0.43	0.44	0.43

Receptor ID	Grid Reference		Annual average HCl concentration (µg/m^3)				
			Stage 1	Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.41	0.42	0.42	0.41	0.41
65	537868	192357	0.40	0.41	0.41	0.41	0.40
66	537868	194945	0.40	0.41	0.41	0.41	0.41
67	538234	194470	0.40	0.42	0.42	0.42	0.42
68	538582	193743	0.41	0.42	0.42	0.42	0.41
69	538859	192695	0.39	0.40	0.40	0.40	0.40
70	537746	192000	0.40	0.40	0.40	0.40	0.40
71	537563	191423	0.39	0.40	0.40	0.40	0.39
72	537290	190671	0.39	0.39	0.39	0.40	0.39
73	536027	190164	0.39	0.39	0.39	0.39	0.39
74	536938	189896	0.39	0.39	0.39	0.39	0.39
75	535938	189488	0.39	0.39	0.39	0.39	0.39
76	537962	190521	0.39	0.39	0.39	0.39	0.39
77	538352	191263	0.39	0.40	0.40	0.40	0.39
78	538685	192418	0.39	0.40	0.40	0.40	0.40
79	534675	190549	0.39	0.40	0.39	0.40	0.39
80	533951	191028	0.39	0.39	0.39	0.39	0.39
81	533895	191855	0.39	0.40	0.40	0.40	0.40
82	533843	192259	0.40	0.41	0.41	0.40	0.40
83	533017	192315	0.40	0.41	0.40	0.40	0.40
84	532801	191780	0.39	0.40	0.40	0.40	0.40
85	533336	191385	0.39	0.40	0.40	0.40	0.39
86	533458	190512	0.39	0.39	0.39	0.39	0.39
87	534238	190267	0.39	0.39	0.39	0.39	0.39
88	533980	189845	0.39	0.39	0.39	0.39	0.39
89	537511	192655	0.40	0.42	0.41	0.41	0.41
90	534361	194275	0.39	0.40	0.40	0.40	0.40
91	535048	194871	0.39	0.40	0.40	0.40	0.40
92	535557	191578	0.39	0.40	0.40	0.40	0.40
93	534953	191953	0.39	0.40	0.40	0.40	0.40
E1	536126	193021	0.40	0.41	0.41	0.41	0.41
E2	536179	193231	0.41	0.43	0.42	0.43	0.42
E3	536273	193493	0.41	0.44	0.43	0.44	0.43

Receptor ID	Grid Reference		Annual average HCl concentration (µg/m^3)				
			Stage 1	Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat
E4	536284	192905	0.41	0.43	0.43	0.44	0.42
E5	536462	192863	0.42	0.45	0.44	0.44	0.43
E6	538006	194754	0.40	0.41	0.41	0.42	0.41
E7	538132	195584	0.40	0.41	0.41	0.41	0.41
E8	539540	194628	0.40	0.41	0.41	0.41	0.41
E9	539498	193756	0.40	0.41	0.41	0.41	0.40
E10	539099	192622	0.39	0.40	0.40	0.40	0.40
E11	538700	190899	0.39	0.39	0.39	0.39	0.39
E12	535433	190794	0.39	0.40	0.40	0.40	0.39

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Vol 2 Appendix 2.2 Table 9: Long-term (annual average) SO_2 concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average SO_2 concentration (µg/m^3)					Significance of annual average SO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	5.1	5.1	5.1	5.1	5.2	Negligible	Negligible	Negligible	Negligible
2	536390	192542	5.1	5.1	5.1	5.2	5.2	Negligible	Negligible	Negligible	Negligible
3	536478	192261	5.1	5.1	5.1	5.3	5.1	Negligible	Negligible	Negligible	Negligible
4	536431	192162	5.1	5.1	5.1	5.3	5.1	Negligible	Negligible	Negligible	Negligible
5	536531	192719	5.1	5.2	5.2	4.9	5.3	Negligible	Negligible	Negligible	Negligible
6	536681	192949	5.1	5.3	5.3	4.9	5.3	Negligible	Negligible	Negligible	Negligible
7	536789	192022	5.1	5.1	5.1	4.9	5.1	Negligible	Negligible	Negligible	Negligible
8	536789	192251	5.1	5.1	5.1	4.3	5.1	Negligible	Negligible	Negligible	Negligible
9	536800	192666	5.1	5.2	5.2	5.2	5.2	Negligible	Negligible	Negligible	Negligible
10	536925	192994	5.1	5.3	5.3	4.4	5.2	Negligible	Negligible	Negligible	Negligible
11	536821	193220	4.5	4.8	4.8	4.5	4.8	Negligible	Negligible	Negligible	Negligible
12	536908	193495	4.5	4.7	4.7	6.8	4.8	Negligible	Negligible	Negligible	Negligible
13	537217	193203	4.7	4.9	4.9	6.8	4.9	Negligible	Negligible	Negligible	Negligible
14	534923	191311	4.2	4.3	4.3	7.0	4.3	Negligible	Negligible	Negligible	Negligible
15	536880	192494	5.1	5.2	5.2	7.0	5.2	Negligible	Negligible	Negligible	Negligible
16	534904	192337	4.4	4.5	4.5	4.6	4.4	Negligible	Negligible	Negligible	Negligible
17	534958	192523	4.4	4.5	4.5	4.6	4.4	Negligible	Negligible	Negligible	Negligible
18	535101	192578	6.7	6.8	6.8	4.5	6.8	Negligible	Negligible	Negligible	Negligible
19	535116	192710	6.7	6.8	6.8	6.2	6.8	Negligible	Negligible	Negligible	Negligible
20	535084	192863	6.7	6.8	6.8	6.2	6.9	Negligible	Negligible	Negligible	Negligible
21	535069	192998	6.7	6.8	6.8	6.2	6.9	Negligible	Negligible	Negligible	Negligible
22	534702	192985	4.4	4.5	4.5	6.2	4.6	Negligible	Negligible	Negligible	Negligible
23	534494	192820	4.4	4.5	4.5	4.3	4.6	Negligible	Negligible	Negligible	Negligible
24	534463	192404	4.4	4.5	4.5	4.3	4.5	Negligible	Negligible	Negligible	Negligible
25	535137	193250	6.0	6.1	6.1	6.2	6.2	Negligible	Negligible	Negligible	Negligible
26	535440	193285	6.0	6.1	6.1	6.2	6.2	Negligible	Negligible	Negligible	Negligible
27	535483	193418	6.0	6.1	6.1	6.2	6.2	Negligible	Negligible	Negligible	Negligible
28	535532	193615	6.0	6.1	6.1	6.2	6.2	Negligible	Negligible	Negligible	Negligible
29	534672	193307	4.2	4.2	4.2	6.2	4.3	Negligible	Negligible	Negligible	Negligible
30	534848	193615	4.2	4.2	4.2	6.8	4.3	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average SO_2 concentration (µg/m^3)					Significance of annual average SO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
31	535109	193782	6.0	6.1	6.1	6.8	6.1	Negligible	Negligible	Negligible	Negligible
32	535348	193899	6.0	6.1	6.1	5.6	6.1	Negligible	Negligible	Negligible	Negligible
33	535289	193329	6.0	6.1	6.1	5.6	6.2	Negligible	Negligible	Negligible	Negligible
34	535774	193917	6.0	6.1	6.1	5.6	6.1	Negligible	Negligible	Negligible	Negligible
35	535975	193888	6.0	6.1	6.1	5.6	6.2	Negligible	Negligible	Negligible	Negligible
36	535048	192151	6.7	6.7	6.7	5.6	6.7	Negligible	Negligible	Negligible	Negligible
37	535108	192015	6.7	6.7	6.7	4.4	6.8	Negligible	Negligible	Negligible	Negligible
38	535499	191989	5.5	5.6	5.6	4.4	5.6	Negligible	Negligible	Negligible	Negligible
39	535673	191965	5.5	5.6	5.6	4.3	5.6	Negligible	Negligible	Negligible	Negligible
40	535743	191924	5.5	5.6	5.6	4.3	5.6	Negligible	Negligible	Negligible	Negligible
41	535866	191864	5.5	5.6	5.6	4.3	5.6	Negligible	Negligible	Negligible	Negligible
42	535954	191647	5.5	5.6	5.6	4.3	5.6	Negligible	Negligible	Negligible	Negligible
43	534991	192230	4.4	4.4	4.4	5.6	4.4	Negligible	Negligible	Negligible	Negligible
44	534883	192033	4.4	4.4	4.4	5.1	4.4	Negligible	Negligible	Negligible	Negligible
45	534799	191902	4.2	4.3	4.3	4.5	4.3	Negligible	Negligible	Negligible	Negligible
46	534813	191648	4.2	4.3	4.3	4.5	4.3	Negligible	Negligible	Negligible	Negligible
47	534820	191439	4.2	4.3	4.3	5.1	4.3	Negligible	Negligible	Negligible	Negligible
48	534785	191044	4.2	4.3	4.3	4.8	4.3	Negligible	Negligible	Negligible	Negligible
49	535877	191031	5.5	5.6	5.6	4.2	5.6	Negligible	Negligible	Negligible	Negligible
50	535781	190813	5.1	5.1	5.1	4.2	5.1	Negligible	Negligible	Negligible	Negligible
51	536190	191057	4.5	4.5	4.5	4.6	4.5	Negligible	Negligible	Negligible	Negligible
52	536543	191108	4.5	4.5	4.5	4.3	4.5	Negligible	Negligible	Negligible	Negligible
53	535964	190902	5.1	5.1	5.1	4.0	5.1	Negligible	Negligible	Negligible	Negligible
54	535731	194625	4.7	4.7	4.7	4.1	4.8	Negligible	Negligible	Negligible	Negligible
55	534858	194334	4.1	4.2	4.2	4.5	4.2	Negligible	Negligible	Negligible	Negligible
56	534050	193710	4.2	4.2	4.2	4.8	4.2	Negligible	Negligible	Negligible	Negligible
57	533242	192667	4.5	4.6	4.6	4.9	4.6	Negligible	Negligible	Negligible	Negligible
58	532942	193649	4.2	4.2	4.2	4.8	4.2	Negligible	Negligible	Negligible	Negligible
59	533487	194593	3.9	4.0	4.0	4.9	4.0	Negligible	Negligible	Negligible	Negligible
60	534092	195241	4.0	4.1	4.1	4.7	4.1	Negligible	Negligible	Negligible	Negligible
61	535712	195583	4.5	4.5	4.5	5.6	4.5	Negligible	Negligible	Negligible	Negligible
62	537328	194146	4.6	4.7	4.7	4.6	4.8	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average SO_2 concentration (µg/m^3)					Significance of annual average SO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
63	537769	193667	4.7	4.9	4.9	4.6	4.9	Negligible	Negligible	Negligible	Negligible
64	537887	193127	4.7	4.8	4.8	4.8	4.8	Negligible	Negligible	Negligible	Negligible
65	537868	192357	4.8	4.8	4.8	4.5	4.8	Negligible	Negligible	Negligible	Negligible
66	537868	194945	4.6	4.7	4.7	4.7	4.7	Negligible	Negligible	Negligible	Negligible
67	538234	194470	5.5	5.6	5.6	4.8	5.6	Negligible	Negligible	Negligible	Negligible
68	538582	193743	4.5	4.6	4.6	4.3	4.6	Negligible	Negligible	Negligible	Negligible
69	538859	192695	4.5	4.6	4.6	4.1	4.6	Negligible	Negligible	Negligible	Negligible
70	537746	192000	4.8	4.8	4.8	4.7	4.8	Negligible	Negligible	Negligible	Negligible
71	537563	191423	4.5	4.5	4.5	4.7	4.5	Negligible	Negligible	Negligible	Negligible
72	537290	190671	4.6	4.7	4.7	4.6	4.7	Negligible	Negligible	Negligible	Negligible
73	536027	190164	4.8	4.8	4.8	4.3	4.8	Negligible	Negligible	Negligible	Negligible
74	536938	189896	4.3	4.3	4.3	4.5	4.3	Negligible	Negligible	Negligible	Negligible
75	535938	189488	4.1	4.1	4.1	4.5	4.1	Negligible	Negligible	Negligible	Negligible
76	537962	190521	4.6	4.7	4.7	4.6	4.7	Negligible	Negligible	Negligible	Negligible
77	538352	191263	4.7	4.7	4.7	4.6	4.7	Negligible	Negligible	Negligible	Negligible
78	538685	192418	4.5	4.6	4.6	4.6	4.6	Negligible	Negligible	Negligible	Negligible
79	534675	190549	4.3	4.3	4.3	4.5	4.3	Negligible	Negligible	Negligible	Negligible
80	533951	191028	4.5	4.5	4.5	4.8	4.5	Negligible	Negligible	Negligible	Negligible
81	533895	191855	4.5	4.5	4.5	4.3	4.5	Negligible	Negligible	Negligible	Negligible
82	533843	192259	4.5	4.6	4.6	4.5	4.6	Negligible	Negligible	Negligible	Negligible
83	533017	192315	4.5	4.5	4.5	4.9	4.5	Negligible	Negligible	Negligible	Negligible
84	532801	191780	4.5	4.6	4.6	4.2	4.6	Negligible	Negligible	Negligible	Negligible
85	533336	191385	4.5	4.5	4.5	4.7	4.5	Negligible	Negligible	Negligible	Negligible
86	533458	190512	4.7	4.7	4.7	5.6	4.8	Negligible	Negligible	Negligible	Negligible
87	534238	190267	4.3	4.3	4.3	4.3	4.3	Negligible	Negligible	Negligible	Negligible
88	533980	189845	4.4	4.5	4.5	4.6	4.5	Negligible	Negligible	Negligible	Negligible
89	537511	192655	4.8	4.9	4.8	4.7	4.9	Negligible	Negligible	Negligible	Negligible
90	534361	194275	4.1	4.2	4.2	4.8	4.2	Negligible	Negligible	Negligible	Negligible
91	535048	194871	4.7	4.7	4.7	5.3	4.7	Negligible	Negligible	Negligible	Negligible
92	535557	191578	5.5	5.6	5.6	5.3	5.6	Negligible	Negligible	Negligible	Negligible
93	534953	191953	4.2	4.3	4.3	5.6	4.3	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	4.5	4.6	4.6	4.4	4.6	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average SO_2 concentration (µg/m^3)					Significance of annual average SO_2 concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E2	536179	193231	4.5	4.6	4.6	5.0	4.7	Negligible	Negligible	Negligible	Negligible
E3	536273	193493	4.5	4.7	4.7	4.4	4.7	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	5.1	5.2	5.2	4.4	5.2	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	5.1	5.3	5.3	4.7	5.3	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	5.5	5.6	5.6	5.1	5.6	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	4.3	4.4	4.4	5.1	4.4	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	4.9	5.0	5.0	5.2	5.0	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	4.3	4.4	4.4	5.3	4.4	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	4.3	4.4	4.4	5.3	4.4	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	4.7	4.7	4.7	4.9	4.7	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	5.1	5.1	5.1	4.9	5.1	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**20**					**-**			

Vol 2 Appendix 2.2 Table 10: Long-term (annual average) Benzo(a)pyrene concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average B(a)P concentration (µg/m^3)					Significance of annual average B(a)P concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.000178	0.000181	0.000181	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.000179	0.000183	0.000182	0.000180	0.000179	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.000178	0.000181	0.000180	0.000179	0.000178	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.000178	0.000180	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.000180	0.000186	0.000185	0.000182	0.000181	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.000183	0.000189	0.000188	0.000181	0.000181	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.000178	0.000180	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.000179	0.000181	0.000181	0.000179	0.000178	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.000180	0.000185	0.000184	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.000183	0.000188	0.000187	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.000183	0.000190	0.000189	0.000183	0.000182	Slight adverse	Negligible	Negligible	Negligible
12	536908	193495	0.000181	0.000189	0.000188	0.000184	0.000183	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.000182	0.000188	0.000187	0.000181	0.000181	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.000179	0.000183	0.000183	0.000180	0.000179	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.000178	0.000180	0.000179	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.000179	0.000181	0.000180	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.000178	0.000180	0.000179	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.000178	0.000181	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.000177	0.000183	0.000182	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.000177	0.000183	0.000182	0.000182	0.000180	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.000178	0.000183	0.000182	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.000179	0.000184	0.000183	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.000179	0.000181	0.000181	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.000177	0.000181	0.000180	0.000180	0.000179	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.000177	0.000182	0.000181	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.000177	0.000182	0.000181	0.000180	0.000180	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.000178	0.000181	0.000181	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.000177	0.000180	0.000180	0.000179	0.000178	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.000177	0.000180	0.000180	0.000179	0.000178	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.000177	0.000181	0.000180	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average B(a)P concentration (µg/m^3)					Significance of annual average B(a)P concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.000177	0.000180	0.000180	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.000177	0.000182	0.000181	0.000180	0.000180	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.000178	0.000181	0.000180	0.000179	0.000178	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.000179	0.000183	0.000182	0.000180	0.000179	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.000177	0.000179	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.000177	0.000179	0.000178	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.000177	0.000179	0.000178	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.000177	0.000179	0.000179	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.000177	0.000179	0.000179	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.000177	0.000179	0.000179	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.000178	0.000179	0.000179	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.000177	0.000179	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.000177	0.000179	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.000177	0.000179	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.000178	0.000180	0.000179	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.000177	0.000179	0.000179	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.000177	0.000179	0.000178	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.000178	0.000181	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.000177	0.000179	0.000178	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.000179	0.000184	0.000183	0.000180	0.000180	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.000181	0.000186	0.000185	0.000181	0.000181	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average B(a)P concentration (µg/m^3)					Significance of annual average B(a)P concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.000180	0.000183	0.000182	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.000178	0.000180	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.000178	0.000182	0.000181	0.000179	0.000178	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.000179	0.000182	0.000182	0.000180	0.000179	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.000180	0.000183	0.000183	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.000177	0.000179	0.000179	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.000178	0.000180	0.000179	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.000177	0.000178	0.000177	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.000177	0.000178	0.000177	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.000177	0.000178	0.000177	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.000177	0.000179	0.000179	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.000178	0.000179	0.000179	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.000178	0.000180	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.000178	0.000180	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.000177	0.000179	0.000179	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.000177	0.000177	0.000177	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.000177	0.000178	0.000177	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.000179	0.000182	0.000181	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.000177	0.000179	0.000178	0.000178	0.000177	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.000177	0.000179	0.000179	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.000177	0.000179	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.000178	0.000181	0.000180	0.000179	0.000178	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.000180	0.000184	0.000183	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average B(a)P concentration (µg/m^3)					Significance of annual average B(a)P concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.000181	0.000186	0.000185	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.000180	0.000185	0.000184	0.000181	0.000180	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.000182	0.000188	0.000187	0.000182	0.000181	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.000179	0.000182	0.000181	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.000178	0.000181	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.000179	0.000181	0.000181	0.000179	0.000179	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.000178	0.000181	0.000180	0.000178	0.000178	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.000177	0.000179	0.000179	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.000177	0.000178	0.000178	0.000177	0.000177	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**0.00025**					**-**			

Vol 2 Appendix 2.2 Table 11: Long-term (annual average) Cd concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Cd concentration (µg/m^3)					Significance of annual average Cd concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.0002	0.0004	0.0004	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.0002	0.0005	0.0005	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.0002	0.0004	0.0004	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.0002	0.0004	0.0004	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.0002	0.0004	0.0004	0.0006	0.0005	Negligible	Negligible	Slight adverse	Slight adverse
12	536908	193495	0.0002	0.0004	0.0004	0.0006	0.0005	Negligible	Negligible	Slight adverse	Slight adverse
13	537217	193203	0.0002	0.0004	0.0004	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.0002	0.0003	0.0003	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.0002	0.0003	0.0003	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.0002	0.0003	0.0003	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cd concentration (µg/m^3)					Significance of annual average Cd concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.0002	0.0003	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.0002	0.0004	0.0004	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cd concentration (µg/m^3)					Significance of annual average Cd concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.0002	0.0003	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.0002	0.0002	0.0002	0.0003	0.0002	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.0002	0.0002	0.0002	0.0002	0.0002	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.0002	0.0002	0.0002	0.0002	0.0002	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.0002	0.0002	0.0002	0.0003	0.0002	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.0002	0.0002	0.0002	0.0003	0.0002	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.0002	0.0002	0.0002	0.0002	0.0002	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.0002	0.0002	0.0002	0.0003	0.0002	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.0002	0.0002	0.0002	0.0002	0.0002	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.0002	0.0003	0.0003	0.0004	0.0004	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cd concentration (µg/m^3)					Significance of annual average Cd concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.0002	0.0004	0.0004	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.0002	0.0004	0.0004	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.0002	0.0004	0.0004	0.0005	0.0004	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.0002	0.0003	0.0003	0.0004	0.0003	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.0002	0.0003	0.0003	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.0002	0.0002	0.0002	0.0003	0.0002	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.0002	0.0002	0.0002	0.0003	0.0003	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**0.005**					**-**			

Vol 2 Appendix 2.2 Table 12: Long-term (annual average) Hg concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Hg concentration (µg/m^3)					Significance of annual average Hg concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.002	0.003	0.003	0.003	0.002	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.002	0.003	0.003	0.003	0.002	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Hg concentration (µg/m^3)					Significance of annual average Hg concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Hg concentration (µg/m^3)					Significance of annual average Hg concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Hg concentration (µg/m^3)					Significance of annual average Hg concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**0.25**					**-**			

Vol 2 Appendix 2.2 Table 13: Long-term (annual average) As concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average As concentration (µg/m^3)					Significance of annual average As concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
2	536390	192542	0.001	0.002	0.002	0.003	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
3	536478	192261	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
4	536431	192162	0.001	0.002	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
5	536531	192719	0.001	0.003	0.003	0.004	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Substantial adverse
6	536681	192949	0.001	0.003	0.003	0.003	0.003	Substantial adverse	Substantial adverse	Substantial adverse	Substantial adverse
7	536789	192022	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
8	536789	192251	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
9	536800	192666	0.001	0.002	0.002	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
10	536925	192994	0.001	0.003	0.003	0.003	0.003	Substantial adverse	Substantial adverse	Substantial adverse	Substantial adverse
11	536821	193220	0.001	0.003	0.003	0.004	0.004	Substantial adverse	Substantial adverse	Substantial adverse	Substantial adverse
12	536908	193495	0.001	0.003	0.003	0.005	0.004	Substantial adverse	Substantial adverse	Substantial adverse	Substantial adverse
13	537217	193203	0.001	0.003	0.003	0.003	0.003	Substantial adverse	Substantial adverse	Substantial adverse	Substantial adverse
14	534923	191311	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
15	536880	192494	0.001	0.002	0.002	0.003	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
16	534904	192337	0.001	0.002	0.002	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse

Receptor ID	Grid Reference		Annual average As concentration (µg/m^3)					Significance of annual average As concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
17	534958	192523	0.001	0.002	0.002	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
18	535101	192578	0.001	0.002	0.002	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
19	535116	192710	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
20	535084	192863	0.001	0.002	0.002	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
21	535069	192998	0.001	0.001	0.001	0.004	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Substantial adverse
22	534702	192985	0.001	0.002	0.002	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Substantial adverse
23	534494	192820	0.001	0.002	0.002	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
24	534463	192404	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
25	535137	193250	0.001	0.001	0.001	0.003	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
26	535440	193285	0.001	0.001	0.001	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
27	535483	193418	0.001	0.001	0.001	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
28	535532	193615	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
29	534672	193307	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
30	534848	193615	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
31	535109	193782	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
32	535348	193899	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse

Receptor ID	Grid Reference		Annual average As concentration (µg/m^3)					Significance of annual average As concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
33	535289	193329	0.001	0.001	0.001	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
34	535774	193917	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
35	535975	193888	0.001	0.002	0.002	0.003	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
36	535048	192151	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
37	535108	192015	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
38	535499	191989	0.001	0.001	0.001	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
39	535673	191965	0.001	0.001	0.001	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
40	535743	191924	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
41	535866	191864	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
42	535954	191647	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
43	534991	192230	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
44	534883	192033	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
45	534799	191902	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
46	534813	191648	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
47	534820	191439	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
48	534785	191044	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse

Receptor ID	Grid Reference		Annual average As concentration (µg/m^3)					Significance of annual average As concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
49	535877	191031	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
50	535781	190813	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
51	536190	191057	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
52	536543	191108	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
53	535964	190902	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
54	535731	194625	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
55	534858	194334	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
56	534050	193710	0.001	0.001	0.001	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
57	533242	192667	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
58	532942	193649	0.001	0.001	0.001	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
59	533487	194593	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse
60	534092	195241	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse
61	535712	195583	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
62	537328	194146	0.001	0.002	0.002	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
63	537769	193667	0.001	0.003	0.003	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Substantial adverse
64	537887	193127	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse

Receptor ID	Grid Reference		Annual average As concentration (µg/m^3)					Significance of annual average As concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
65	537868	192357	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
66	537868	194945	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
67	538234	194470	0.001	0.002	0.002	0.003	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
68	538582	193743	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
69	538859	192695	0.001	0.001	0.001	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
70	537746	192000	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
71	537563	191423	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
72	537290	190671	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse
73	536027	190164	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse
74	536938	189896	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
75	535938	189488	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
76	537962	190521	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
77	538352	191263	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
78	538685	192418	0.001	0.001	0.001	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
79	534675	190549	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse
80	533951	191028	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Slight adverse

Receptor ID	Grid Reference		Annual average As concentration (µg/m^3)					Significance of annual average As concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
81	533895	191855	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
82	533843	192259	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
83	533017	192315	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
84	532801	191780	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
85	533336	191385	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
86	533458	190512	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
87	534238	190267	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
88	533980	189845	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
89	537511	192655	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
90	534361	194275	0.001	0.001	0.001	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
91	535048	194871	0.001	0.001	0.001	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
92	535557	191578	0.001	0.001	0.001	0.002	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
93	534953	191953	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
E1	536126	193021	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
E2	536179	193231	0.001	0.002	0.002	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
E3	536273	193493	0.001	0.003	0.003	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Substantial adverse

Receptor ID	Grid Reference		Annual average As concentration (µg/m^3)					Significance of annual average As concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E4	536284	192905	0.001	0.003	0.002	0.003	0.003	Moderate adverse	Moderate adverse	Substantial adverse	Moderate adverse
E5	536462	192863	0.001	0.003	0.003	0.004	0.003	Substantial adverse	Substantial adverse	Substantial adverse	Substantial adverse
E6	538006	194754	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
E7	538132	195584	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
E8	539540	194628	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
E9	539498	193756	0.001	0.002	0.002	0.002	0.002	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
E10	539099	192622	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
E11	538700	190899	0.001	0.001	0.001	0.001	0.001	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse
E12	535433	190794	0.001	0.001	0.001	0.001	0.001	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse
Air Quality Objective			**0.003**					**-**			

Vol 2 Appendix 2.2 Table 14: Long-term (annual average) Pb concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Pb concentration (µg/m^3)					Significance of annual average Pb concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.009	0.011	0.011	0.012	0.011	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.010	0.012	0.012	0.012	0.011	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.009	0.011	0.011	0.011	0.011	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.010	0.012	0.011	0.011	0.011	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.010	0.012	0.012	0.013	0.012	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.009	0.011	0.011	0.013	0.012	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.009	0.011	0.011	0.012	0.011	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.009	0.010	0.010	0.010	0.009	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.009	0.010	0.010	0.012	0.011	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.009	0.010	0.010	0.012	0.011	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.009	0.010	0.010	0.012	0.011	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Pb concentration (µg/m^3)					Significance of annual average Pb concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.009	0.010	0.010	0.010	0.009	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.009	0.010	0.010	0.010	0.009	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.009	0.011	0.011	0.012	0.011	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Pb concentration (µg/m^3)					Significance of annual average Pb concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Pb concentration (µg/m^3)					Significance of annual average Pb concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.009	0.011	0.011	0.012	0.011	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.009	0.011	0.011	0.012	0.011	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.009	0.011	0.011	0.012	0.011	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**0.25**					**-**			

Vol 2 Appendix 2.2 Table 15: Long-term (annual average) Ni concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Ni concentration (µg/m^3)					Significance of annual average Ni concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Slight adverse
2	536390	192542	0.002	0.003	0.003	0.004	0.003	Negligible	Negligible	Slight adverse	Slight adverse
3	536478	192261	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
4	536431	192162	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
5	536531	192719	0.002	0.003	0.003	0.004	0.004	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
6	536681	192949	0.002	0.004	0.004	0.004	0.004	Moderate adverse	Slight adverse	Moderate adverse	Slight adverse
7	536789	192022	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
9	536800	192666	0.002	0.003	0.003	0.004	0.004	Slight adverse	Slight adverse	Slight adverse	Slight adverse
10	536925	192994	0.002	0.004	0.004	0.004	0.004	Slight adverse	Slight adverse	Slight adverse	Slight adverse
11	536821	193220	0.002	0.004	0.004	0.005	0.005	Moderate adverse	Slight adverse	Moderate adverse	Moderate adverse
12	536908	193495	0.002	0.004	0.004	0.005	0.005	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse
13	537217	193203	0.002	0.004	0.004	0.004	0.004	Slight adverse	Slight adverse	Slight adverse	Slight adverse
14	534923	191311	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.002	0.003	0.003	0.004	0.003	Negligible	Negligible	Slight adverse	Slight adverse
16	534904	192337	0.002	0.003	0.003	0.002	0.002	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.002	0.003	0.003	0.003	0.002	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.002	0.003	0.003	0.002	0.002	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.002	0.003	0.002	0.004	0.004	Negligible	Negligible	Moderate adverse	Slight adverse
21	535069	192998	0.002	0.002	0.002	0.004	0.004	Negligible	Negligible	Moderate adverse	Slight adverse
22	534702	192985	0.002	0.003	0.003	0.004	0.004	Negligible	Negligible	Moderate adverse	Slight adverse
23	534494	192820	0.002	0.003	0.003	0.004	0.004	Negligible	Negligible	Slight adverse	Slight adverse
24	534463	192404	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.002	0.002	0.002	0.004	0.003	Negligible	Negligible	Slight adverse	Slight adverse

Receptor ID	Grid Reference		Annual average Ni concentration (µg/m^3)					Significance of annual average Ni concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
26	535440	193285	0.002	0.002	0.002	0.004	0.004	Negligible	Negligible	Moderate adverse	Slight adverse
27	535483	193418	0.002	0.002	0.002	0.004	0.003	Negligible	Negligible	Slight adverse	Slight adverse
28	535532	193615	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Slight adverse	Slight adverse
29	534672	193307	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Slight adverse	Slight adverse
30	534848	193615	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
31	535109	193782	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Slight adverse	Slight adverse
32	535348	193899	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Slight adverse	Slight adverse
33	535289	193329	0.002	0.002	0.002	0.004	0.004	Negligible	Negligible	Moderate adverse	Slight adverse
34	535774	193917	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
35	535975	193888	0.002	0.003	0.003	0.004	0.003	Negligible	Negligible	Slight adverse	Slight adverse
36	535048	192151	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Ni concentration (µg/m^3)					Significance of annual average Ni concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
56	534050	193710	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.002	0.003	0.003	0.004	0.004	Slight adverse	Negligible	Slight adverse	Slight adverse
63	537769	193667	0.002	0.004	0.004	0.004	0.004	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
64	537887	193127	0.002	0.003	0.003	0.003	0.003	Slight adverse	Slight adverse	Slight adverse	Negligible
65	537868	192357	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
67	538234	194470	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Slight adverse
68	538582	193743	0.002	0.003	0.003	0.003	0.003	Slight adverse	Slight adverse	Slight adverse	Slight adverse
69	538859	192695	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.002	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Ni concentration (µg/m^3)					Significance of annual average Ni concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
87	534238	190267	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
90	534361	194275	0.002	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
E2	536179	193231	0.002	0.003	0.003	0.004	0.003	Slight adverse	Slight adverse	Slight adverse	Slight adverse
E3	536273	193493	0.002	0.004	0.003	0.004	0.004	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
E4	536284	192905	0.002	0.003	0.003	0.004	0.004	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
E5	536462	192863	0.002	0.004	0.004	0.005	0.004	Slight adverse	Slight adverse	Moderate adverse	Slight adverse
E6	538006	194754	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
E7	538132	195584	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Slight adverse	Negligible
E9	539498	193756	0.002	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.002	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**0.02**					**-**			

Vol 2 Appendix 2.2 Table 16: Long-term (annual average) Sb concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Sb concentration (µg/m^3)					Significance of annual average Sb concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.001	0.003	0.003	0.004	0.003	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.002	0.004	0.004	0.004	0.003	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.001	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.002	0.004	0.004	0.003	0.003	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.002	0.004	0.004	0.005	0.004	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.001	0.003	0.003	0.005	0.004	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.002	0.004	0.003	0.004	0.003	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.001	0.002	0.002	0.004	0.003	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.001	0.002	0.002	0.004	0.003	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.001	0.002	0.002	0.004	0.003	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Sb concentration (µg/m^3)					Significance of annual average Sb concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.001	0.002	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.001	0.002	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.001	0.002	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.001	0.002	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.001	0.003	0.003	0.004	0.003	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Sb concentration (µg/m^3)					Significance of annual average Sb concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.001	0.003	0.003	0.002	0.002	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.001	0.002	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.001	0.003	0.002	0.003	0.003	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.001	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.001	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.001	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.001	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.001	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.001	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.001	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.001	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.001	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.001	0.003	0.003	0.003	0.003	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Sb concentration (µg/m^3)					Significance of annual average Sb concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.001	0.003	0.003	0.004	0.003	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.001	0.003	0.003	0.004	0.003	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.002	0.003	0.003	0.004	0.003	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.001	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.001	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.001	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.001	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**5**					**-**			

Vol 2 Appendix 2.2 Table 17: Long-term (annual average) Cr concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Cr concentration (µg/m^3)					Significance of annual average Cr concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.005	0.006	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.005	0.005	0.005	0.006	0.005	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.005	0.005	0.005	0.006	0.005	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.005	0.006	0.006	0.007	0.007	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.005	0.007	0.007	0.007	0.007	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.005	0.006	0.006	0.007	0.006	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.005	0.007	0.007	0.007	0.007	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.005	0.007	0.007	0.008	0.007	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.005	0.007	0.007	0.008	0.008	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.005	0.007	0.007	0.007	0.007	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.005	0.006	0.006	0.006	0.006	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.005	0.006	0.006	0.005	0.005	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.005	0.005	0.005	0.006	0.005	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.005	0.005	0.005	0.007	0.006	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.005	0.005	0.005	0.007	0.007	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.005	0.005	0.005	0.007	0.007	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.005	0.006	0.006	0.007	0.006	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.005	0.006	0.006	0.006	0.005	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.005	0.005	0.005	0.007	0.006	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.005	0.005	0.005	0.007	0.006	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cr concentration (µg/m^3)					Significance of annual average Cr concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.005	0.005	0.005	0.007	0.006	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.005	0.006	0.006	0.006	0.006	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.005	0.005	0.005	0.006	0.005	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.004	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.004	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.005	0.006	0.006	0.007	0.006	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.005	0.006	0.006	0.007	0.007	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cr concentration (µg/m^3)					Significance of annual average Cr concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.005	0.006	0.006	0.006	0.006	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.005	0.005	0.005	0.006	0.005	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.005	0.006	0.006	0.006	0.006	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.005	0.006	0.006	0.006	0.006	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.004	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.004	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.004	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.004	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.004	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.004	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.005	0.006	0.006	0.006	0.006	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.005	0.005	0.005	0.006	0.005	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.005	0.006	0.006	0.007	0.006	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cr concentration (µg/m^3)					Significance of annual average Cr concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.005	0.006	0.006	0.007	0.007	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.005	0.006	0.006	0.007	0.006	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.005	0.007	0.007	0.007	0.007	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.005	0.005	0.005	0.006	0.005	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.005	0.005	0.005	0.006	0.006	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.005	0.005	0.005	0.005	0.005	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**5**					**-**			

Vol 2 Appendix 2.2 Table 18: Long-term (annual average) Co concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Co concentration (µg/m^3)					Significance of annual average Co concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.0003	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.0004	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.0005	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.0007	0.003	0.003	0.003	0.002	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.0004	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.0005	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.0007	0.003	0.003	0.003	0.002	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.0007	0.003	0.003	0.004	0.003	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.0006	0.002	0.002	0.004	0.003	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.0007	0.003	0.003	0.003	0.002	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.0004	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.0004	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.0003	0.001	0.001	0.003	0.002	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.0002	0.001	0.001	0.003	0.002	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.0003	0.001	0.001	0.003	0.002	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.0004	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.0004	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.0002	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.0002	0.001	0.001	0.003	0.002	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.0003	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.0003	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.0002	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.0002	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.0003	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Co concentration (µg/m^3)					Significance of annual average Co concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.0003	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.0002	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.0003	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.0004	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.0002	0.000	0.000	0.001	0.001	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.0002	0.000	0.000	0.001	0.001	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.0004	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.0005	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Co concentration (µg/m^3)					Significance of annual average Co concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.0005	0.002	0.002	0.002	0.001	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.0004	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.0004	0.001	0.001	0.002	0.002	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.0004	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.0002	0.001	0.000	0.001	0.001	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.0002	0.000	0.000	0.001	0.000	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.0002	0.000	0.000	0.001	0.000	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.0002	0.000	0.000	0.001	0.000	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.0002	0.000	0.000	0.001	0.001	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.0002	0.000	0.000	0.001	0.000	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.0002	0.000	0.000	0.001	0.001	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.0002	0.000	0.000	0.001	0.000	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.0004	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.0003	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.0005	0.002	0.002	0.002	0.002	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Co concentration (µg/m^3)					Significance of annual average Co concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.0005	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.0005	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.0006	0.002	0.002	0.003	0.002	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.0004	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.0004	0.001	0.001	0.002	0.001	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.0004	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.0003	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.0002	0.000	0.000	0.001	0.001	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.0002	0.001	0.001	0.001	0.001	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**1**					**-**			

Vol 2 Appendix 2.2 Table 19: Long-term (annual average) Cu concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Cu concentration (µg/m^3)					Significance of annual average Cu concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.036	0.037	0.037	0.038	0.037	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.036	0.037	0.037	0.038	0.038	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.036	0.038	0.038	0.038	0.038	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.036	0.037	0.037	0.038	0.038	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.036	0.038	0.038	0.038	0.038	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.036	0.038	0.038	0.039	0.039	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.036	0.038	0.038	0.039	0.039	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.036	0.038	0.038	0.038	0.038	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.036	0.037	0.037	0.038	0.037	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.036	0.037	0.037	0.036	0.036	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.036	0.037	0.037	0.037	0.036	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.036	0.037	0.037	0.036	0.036	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.036	0.037	0.036	0.038	0.038	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.036	0.036	0.036	0.038	0.038	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.036	0.037	0.037	0.038	0.038	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.036	0.037	0.037	0.038	0.038	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.036	0.036	0.036	0.038	0.037	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.036	0.036	0.036	0.038	0.038	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.036	0.036	0.036	0.038	0.037	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cu concentration (µg/m^3)					Significance of annual average Cu concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.036	0.036	0.036	0.038	0.038	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.036	0.037	0.037	0.038	0.037	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.036	0.036	0.036	0.037	0.036	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.036	0.036	0.036	0.037	0.036	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.036	0.036	0.036	0.037	0.036	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.036	0.036	0.036	0.037	0.036	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.036	0.036	0.036	0.037	0.036	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.036	0.037	0.037	0.038	0.038	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.036	0.038	0.038	0.038	0.038	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cu concentration (µg/m^3)					Significance of annual average Cu concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.036	0.036	0.036	0.037	0.036	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.036	0.036	0.036	0.037	0.037	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.036	0.036	0.036	0.037	0.036	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.036	0.037	0.037	0.038	0.037	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Cu concentration (µg/m^3)					Significance of annual average Cu concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.036	0.038	0.037	0.038	0.038	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.036	0.037	0.037	0.038	0.038	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.036	0.038	0.038	0.039	0.038	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.036	0.037	0.037	0.037	0.037	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.036	0.036	0.036	0.036	0.036	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**10**					**-**			

Vol 2 Appendix 2.2 Table 20: Long-term (annual average) Mn concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average Mn concentration (µg/m^3)					Significance of annual average Mn concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.009	0.011	0.011	0.011	0.011	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.009	0.011	0.011	0.011	0.011	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.009	0.011	0.011	0.012	0.012	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.009	0.011	0.011	0.012	0.012	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.009	0.011	0.011	0.011	0.011	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.009	0.010	0.010	0.010	0.009	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.009	0.010	0.010	0.009	0.009	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.009	0.009	0.009	0.011	0.011	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.009	0.009	0.009	0.011	0.011	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.009	0.009	0.009	0.011	0.011	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.009	0.009	0.009	0.011	0.010	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Mn concentration (µg/m^3)					Significance of annual average Mn concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.009	0.009	0.009	0.011	0.010	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.009	0.010	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.009	0.010	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.009	0.011	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Mn concentration (µg/m^3)					Significance of annual average Mn concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.009	0.009	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.009	0.010	0.010	0.010	0.009	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.009	0.009	0.009	0.010	0.009	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.009	0.010	0.010	0.011	0.010	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average Mn concentration (µg/m^3)					Significance of annual average Mn concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.009	0.010	0.010	0.011	0.011	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.009	0.011	0.011	0.011	0.011	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.009	0.010	0.009	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.009	0.010	0.010	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.009	0.009	0.009	0.009	0.009	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**0.15**					**-**			

Vol 2 Appendix 2.2 Table 21: Long-term (annual average) V concentrations and significance at discrete receptors

Receptor ID	Grid Reference		Annual average V concentration (µg/m^3)					Significance of annual average V concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
2	536390	192542	0.009	0.003	0.003	0.011	0.010	Negligible	Negligible	Negligible	Negligible
3	536478	192261	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
4	536431	192162	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
5	536531	192719	0.009	0.003	0.003	0.011	0.011	Negligible	Negligible	Negligible	Negligible
6	536681	192949	0.009	0.004	0.004	0.011	0.011	Negligible	Negligible	Negligible	Negligible
7	536789	192022	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
8	536789	192251	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
9	536800	192666	0.009	0.003	0.003	0.011	0.011	Negligible	Negligible	Negligible	Negligible
10	536925	192994	0.009	0.004	0.004	0.011	0.011	Negligible	Negligible	Negligible	Negligible
11	536821	193220	0.009	0.004	0.004	0.012	0.012	Negligible	Negligible	Negligible	Negligible
12	536908	193495	0.009	0.004	0.004	0.012	0.012	Negligible	Negligible	Negligible	Negligible
13	537217	193203	0.009	0.004	0.004	0.011	0.011	Negligible	Negligible	Negligible	Negligible
14	534923	191311	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
15	536880	192494	0.009	0.003	0.003	0.011	0.010	Negligible	Negligible	Negligible	Negligible
16	534904	192337	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
17	534958	192523	0.009	0.003	0.003	0.010	0.009	Negligible	Negligible	Negligible	Negligible
18	535101	192578	0.009	0.003	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
19	535116	192710	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
20	535084	192863	0.009	0.002	0.002	0.011	0.011	Negligible	Negligible	Negligible	Negligible
21	535069	192998	0.009	0.002	0.002	0.011	0.011	Negligible	Negligible	Negligible	Negligible
22	534702	192985	0.009	0.003	0.003	0.011	0.011	Negligible	Negligible	Negligible	Negligible
23	534494	192820	0.009	0.003	0.003	0.011	0.011	Negligible	Negligible	Negligible	Negligible
24	534463	192404	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
25	535137	193250	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
26	535440	193285	0.009	0.002	0.002	0.011	0.011	Negligible	Negligible	Negligible	Negligible
27	535483	193418	0.009	0.002	0.002	0.011	0.010	Negligible	Negligible	Negligible	Negligible
28	535532	193615	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
29	534672	193307	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
30	534848	193615	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
31	535109	193782	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average V concentration (µg/m^3)					Significance of annual average V concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
32	535348	193899	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
33	535289	193329	0.009	0.002	0.002	0.011	0.010	Negligible	Negligible	Negligible	Negligible
34	535774	193917	0.009	0.003	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
35	535975	193888	0.009	0.003	0.003	0.011	0.010	Negligible	Negligible	Negligible	Negligible
36	535048	192151	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
37	535108	192015	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
38	535499	191989	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
39	535673	191965	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
40	535743	191924	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
41	535866	191864	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
42	535954	191647	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
43	534991	192230	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
44	534883	192033	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
45	534799	191902	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
46	534813	191648	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
47	534820	191439	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
48	534785	191044	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
49	535877	191031	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
50	535781	190813	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
51	536190	191057	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
52	536543	191108	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
53	535964	190902	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
54	535731	194625	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
55	534858	194334	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
56	534050	193710	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
57	533242	192667	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
58	532942	193649	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
59	533487	194593	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
60	534092	195241	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
61	535712	195583	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
62	537328	194146	0.009	0.003	0.003	0.011	0.010	Negligible	Negligible	Negligible	Negligible
63	537769	193667	0.009	0.003	0.003	0.011	0.011	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average V concentration (µg/m^3)					Significance of annual average V concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
64	537887	193127	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
65	537868	192357	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
66	537868	194945	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
67	538234	194470	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
68	538582	193743	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
69	538859	192695	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
70	537746	192000	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
71	537563	191423	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
72	537290	190671	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
73	536027	190164	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
74	536938	189896	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
75	535938	189488	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
76	537962	190521	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
77	538352	191263	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
78	538685	192418	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
79	534675	190549	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
80	533951	191028	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
81	533895	191855	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
82	533843	192259	0.009	0.003	0.003	0.010	0.009	Negligible	Negligible	Negligible	Negligible
83	533017	192315	0.009	0.002	0.002	0.010	0.009	Negligible	Negligible	Negligible	Negligible
84	532801	191780	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
85	533336	191385	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
86	533458	190512	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
87	534238	190267	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
88	533980	189845	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
89	537511	192655	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
90	534361	194275	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
91	535048	194871	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
92	535557	191578	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
93	534953	191953	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
E1	536126	193021	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E2	536179	193231	0.009	0.003	0.003	0.011	0.010	Negligible	Negligible	Negligible	Negligible

Receptor ID	Grid Reference		Annual average V concentration (µg/m^3)					Significance of annual average V concentration			
			Stage 1	Stage 2		Stages 3/4		Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat	Wet	Wet with reheat
E3	536273	193493	0.009	0.003	0.003	0.011	0.011	Negligible	Negligible	Negligible	Negligible
E4	536284	192905	0.009	0.003	0.003	0.011	0.011	Negligible	Negligible	Negligible	Negligible
E5	536462	192863	0.009	0.004	0.004	0.011	0.011	Negligible	Negligible	Negligible	Negligible
E6	538006	194754	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E7	538132	195584	0.009	0.002	0.002	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E8	539540	194628	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E9	539498	193756	0.009	0.003	0.003	0.010	0.010	Negligible	Negligible	Negligible	Negligible
E10	539099	192622	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
E11	538700	190899	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
E12	535433	190794	0.009	0.002	0.002	0.009	0.009	Negligible	Negligible	Negligible	Negligible
Air Quality Objective			**5**					**-**			

As no there is no assessment level for dioxins and furans, the significance cannot be derived for the discrete receptors. Concentrations including background are presented below.

Vol 2 Appendix 2.2 Table 22: Long-term (annual average) concentrations of dioxins and furans at discrete receptors

Receptor ID	Grid Reference		Annual average dioxin and furan concentration (µg/m^3)				
			Stage 1	Stage 2		Stage 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat
1	536326	192465	0.0000000337	0.0000000339	0.0000000339	0.0000000341	0.0000000340
2	536390	192542	0.0000000337	0.0000000339	0.0000000339	0.0000000341	0.0000000341
3	536478	192261	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000339
4	536431	192162	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000339
5	536531	192719	0.0000000338	0.0000000341	0.0000000341	0.0000000343	0.0000000342
6	536681	192949	0.0000000338	0.0000000342	0.0000000342	0.0000000343	0.0000000342
7	536789	192022	0.0000000337	0.0000000339	0.0000000339	0.0000000339	0.0000000339
8	536789	192251	0.0000000338	0.0000000339	0.0000000339	0.0000000340	0.0000000340
9	536800	192666	0.0000000338	0.0000000340	0.0000000340	0.0000000342	0.0000000341
10	536925	192994	0.0000000338	0.0000000342	0.0000000342	0.0000000342	0.0000000342
11	536821	193220	0.0000000338	0.0000000342	0.0000000342	0.0000000344	0.0000000343
12	536908	193495	0.0000000338	0.0000000341	0.0000000341	0.0000000345	0.0000000344
13	537217	193203	0.0000000338	0.0000000342	0.0000000342	0.0000000342	0.0000000342
14	534923	191311	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
15	536880	192494	0.0000000338	0.0000000340	0.0000000340	0.0000000341	0.0000000340
16	534904	192337	0.0000000337	0.0000000339	0.0000000339	0.0000000339	0.0000000338
17	534958	192523	0.0000000338	0.0000000339	0.0000000339	0.0000000339	0.0000000339
18	535101	192578	0.0000000337	0.0000000339	0.0000000339	0.0000000339	0.0000000338
19	535116	192710	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000339
20	535084	192863	0.0000000337	0.0000000339	0.0000000339	0.0000000343	0.0000000341
21	535069	192998	0.0000000337	0.0000000338	0.0000000338	0.0000000343	0.0000000342
22	534702	192985	0.0000000337	0.0000000339	0.0000000339	0.0000000343	0.0000000342
23	534494	192820	0.0000000338	0.0000000339	0.0000000339	0.0000000342	0.0000000341
24	534463	192404	0.0000000338	0.0000000340	0.0000000340	0.0000000340	0.0000000339
25	535137	193250	0.0000000337	0.0000000338	0.0000000338	0.0000000341	0.0000000340
26	535440	193285	0.0000000337	0.0000000338	0.0000000338	0.0000000342	0.0000000341
27	535483	193418	0.0000000337	0.0000000338	0.0000000338	0.0000000342	0.0000000341
28	535532	193615	0.0000000337	0.0000000339	0.0000000339	0.0000000341	0.0000000340

Receptor ID	Grid Reference		Annual average dioxin and furan concentration (µg/m^3)				
			Stage 1	Stage 2		Stage 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat
29	534672	193307	0.0000000337	0.0000000338	0.0000000338	0.0000000340	0.0000000340
30	534848	193615	0.0000000337	0.0000000338	0.0000000338	0.0000000340	0.0000000340
31	535109	193782	0.0000000337	0.0000000338	0.0000000338	0.0000000341	0.0000000340
32	535348	193899	0.0000000337	0.0000000338	0.0000000338	0.0000000340	0.0000000340
33	535289	193329	0.0000000337	0.0000000338	0.0000000338	0.0000000342	0.0000000341
34	535774	193917	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000340
35	535975	193888	0.0000000338	0.0000000339	0.0000000339	0.0000000341	0.0000000340
36	535048	192151	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
37	535108	192015	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
38	535499	191989	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
39	535673	191965	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
40	535743	191924	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
41	535866	191864	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
42	535954	191647	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
43	534991	192230	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
44	534883	192033	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
45	534799	191902	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
46	534813	191648	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
47	534820	191439	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
48	534785	191044	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
49	535877	191031	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
50	535781	190813	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
51	536190	191057	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
52	536543	191108	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
53	535964	190902	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
54	535731	194625	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
55	534858	194334	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
56	534050	193710	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
57	533242	192667	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000339
58	532942	193649	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
59	533487	194593	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
60	534092	195241	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
61	535712	195583	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
62	537328	194146	0.0000000338	0.0000000340	0.0000000340	0.0000000342	0.0000000341

Receptor ID	Grid Reference		Annual average dioxin and furan concentration (µg/m^3)				
			Stage 1	Stage 2		Stage 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat
63	537769	193667	0.0000000338	0.0000000341	0.0000000341	0.0000000342	0.0000000342
64	537887	193127	0.0000000338	0.0000000340	0.0000000340	0.0000000340	0.0000000340
65	537868	192357	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000339
66	537868	194945	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000340
67	538234	194470	0.0000000338	0.0000000339	0.0000000339	0.0000000341	0.0000000340
68	538582	193743	0.0000000338	0.0000000340	0.0000000340	0.0000000341	0.0000000340
69	538859	192695	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
70	537746	192000	0.0000000337	0.0000000339	0.0000000339	0.0000000339	0.0000000339
71	537563	191423	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
72	537290	190671	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
73	536027	190164	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
74	536938	189896	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
75	535938	189488	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
76	537962	190521	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
77	538352	191263	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
78	538685	192418	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
79	534675	190549	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
80	533951	191028	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
81	533895	191855	0.0000000337	0.0000000339	0.0000000339	0.0000000339	0.0000000338
82	533843	192259	0.0000000337	0.0000000339	0.0000000339	0.0000000339	0.0000000339
83	533017	192315	0.0000000337	0.0000000339	0.0000000339	0.0000000339	0.0000000339
84	532801	191780	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
85	533336	191385	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
86	533458	190512	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
87	534238	190267	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
88	533980	189845	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
89	537511	192655	0.0000000338	0.0000000339	0.0000000339	0.0000000340	0.0000000340
90	534361	194275	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
91	535048	194871	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
92	535557	191578	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
93	534953	191953	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000338
E1	536126	193021	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000339
E2	536179	193231	0.0000000338	0.0000000340	0.0000000340	0.0000000342	0.0000000341
E3	536273	193493	0.0000000338	0.0000000341	0.0000000341	0.0000000343	0.0000000342

Receptor ID	Grid Reference		Annual average dioxin and furan concentration (µg/m^3)				
			Stage 1	Stage 2		Stage 3/4	
	X	Y	Existing EfW facility	Wet	Wet with reheat	Wet	Wet with reheat
E4	536284	192905	0.0000000338	0.0000000340	0.0000000340	0.0000000342	0.0000000341
E5	536462	192863	0.0000000338	0.0000000342	0.0000000342	0.0000000343	0.0000000342
E6	538006	194754	0.0000000338	0.0000000339	0.0000000339	0.0000000340	0.0000000340
E7	538132	195584	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000339
E8	539540	194628	0.0000000337	0.0000000339	0.0000000339	0.0000000340	0.0000000340
E9	539498	193756	0.0000000337	0.0000000339	0.0000000339	0.0000000339	0.0000000339
E10	539099	192622	0.0000000337	0.0000000338	0.0000000338	0.0000000339	0.0000000339
E11	538700	190899	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338
E12	535433	190794	0.0000000337	0.0000000338	0.0000000338	0.0000000338	0.0000000338

As no background monitoring of Hydrogen Fluoride (HF) or Thallium (Tl) is undertaken in the UK, concentrations cannot be derived for these pollutants, as such, process contributions are presented below.

Vol 2 Appendix 2.2 Table 23: Process contribution of HF and Tl at discrete receptors

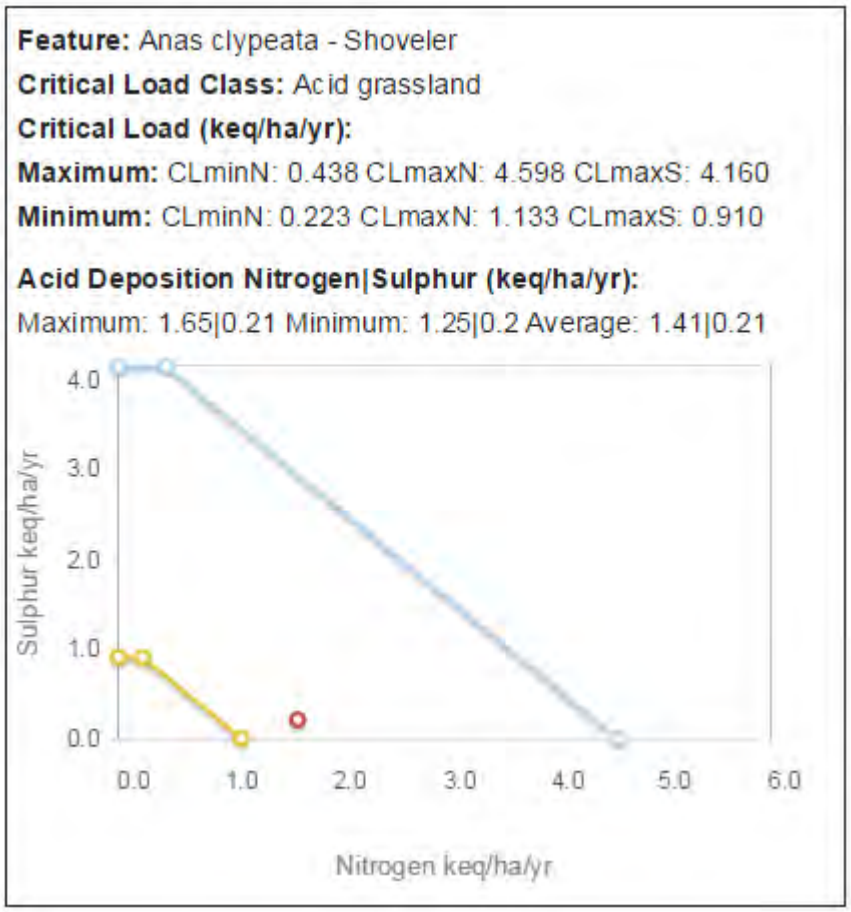
Receptor ID	Grid Reference		Annual average HF process contribution (µg/m^3)					Annual average Tl process contribution (µg/m^3)				
			Stage 1	Stage 2		Stages 3/4		Stage 1	Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet FGT	Wet with reheat FGT	Wet FGT	Wet with reheat FGT	Existing EfW facility	Wet FGT	Wet with reheat FGT	Wet FGT	Wet with reheat FGT
1	536326	192465	0.00007	0.00007	0.00006	0.0034	0.0026	0.000003	0.000004	0.000003	0.00017	0.00013
2	536390	192542	0.00009	0.00009	0.00007	0.0041	0.0032	0.000004	0.000004	0.000003	0.00020	0.00016
3	536478	192261	0.00007	0.00006	0.00005	0.0027	0.0021	0.000004	0.000003	0.000002	0.00014	0.00011
4	536431	192162	0.00006	0.00005	0.00004	0.0025	0.0019	0.000003	0.000003	0.000002	0.00012	0.00010
5	536531	192719	0.00016	0.00012	0.00010	0.0055	0.0045	0.000008	0.000006	0.000005	0.00027	0.00023
6	536681	192949	0.00025	0.00012	0.00010	0.0054	0.0046	0.000012	0.000006	0.000005	0.00027	0.00023
7	536789	192022	0.00007	0.00004	0.00004	0.0020	0.0016	0.000003	0.000002	0.000002	0.00010	0.00008
8	536789	192251	0.00009	0.00006	0.00005	0.0027	0.0022	0.000005	0.000003	0.000002	0.00014	0.00011
9	536800	192666	0.00015	0.00010	0.00008	0.0045	0.0039	0.000007	0.000005	0.000004	0.00023	0.00019
10	536925	192994	0.00024	0.00010	0.00009	0.0048	0.0042	0.000012	0.000005	0.000004	0.00024	0.00021
11	536821	193220	0.00024	0.00015	0.00013	0.0071	0.0061	0.000012	0.000007	0.000006	0.00036	0.00030
12	536908	193495	0.00018	0.00016	0.00014	0.0075	0.0064	0.000009	0.000008	0.000007	0.00037	0.00032
13	537217	193203	0.00023	0.00011	0.00010	0.0051	0.0044	0.000011	0.000005	0.000005	0.00026	0.00022
14	534923	191311	0.00004	0.00003	0.00002	0.0013	0.0010	0.000002	0.000001	0.000001	0.00006	0.00005
15	536880	192494	0.00012	0.00008	0.00007	0.0037	0.0031	0.000006	0.000004	0.000003	0.00019	0.00016
16	534904	192337	0.00008	0.00003	0.00002	0.0015	0.0011	0.000004	0.000002	0.000001	0.00008	0.00006
17	534958	192523	0.00011	0.00004	0.00003	0.0019	0.0014	0.000005	0.000002	0.000001	0.00009	0.00007
18	535101	192578	0.00008	0.00003	0.00002	0.0015	0.0011	0.000004	0.000002	0.000001	0.00008	0.00005
19	535116	192710	0.00007	0.00005	0.00004	0.0024	0.0017	0.000004	0.000003	0.000002	0.00012	0.00009
20	535084	192863	0.00005	0.00011	0.00009	0.0053	0.0040	0.000003	0.000006	0.000004	0.00026	0.00020
21	535069	192998	0.00004	0.00012	0.00009	0.0055	0.0043	0.000002	0.000006	0.000004	0.00028	0.00021
22	534702	192985	0.00007	0.00012	0.00010	0.0054	0.0044	0.000003	0.000006	0.000005	0.00027	0.00022
23	534494	192820	0.00010	0.00010	0.00008	0.0046	0.0038	0.000005	0.000005	0.000004	0.00023	0.00019
24	534463	192404	0.00011	0.00005	0.00004	0.0023	0.0018	0.000005	0.000002	0.000002	0.00011	0.00009
25	535137	193250	0.00004	0.00008	0.00006	0.0037	0.0029	0.000002	0.000004	0.000003	0.00018	0.00014
26	535440	193285	0.00004	0.00010	0.00008	0.0048	0.0039	0.000002	0.000005	0.000004	0.00024	0.00020
27	535483	193418	0.00005	0.00009	0.00008	0.0042	0.0035	0.000002	0.000004	0.000004	0.00021	0.00018

Receptor ID	Grid Reference		Annual average HF process contribution (µg/m^3)					Annual average TI process contribution (µg/m^3)				
			Stage 1	Stage 2		Stages 3/4		Stage 1	Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet FGT	Wet with reheat FGT	Wet FGT	Wet with reheat FGT	Existing EfW facility	Wet FGT	Wet with reheat FGT	Wet FGT	Wet with reheat FGT
28	535532	193615	0.00006	0.00007	0.00006	0.0034	0.0028	0.000003	0.000004	0.000003	0.00017	0.00014
29	534672	193307	0.00004	0.00007	0.00005	0.0031	0.0025	0.000002	0.000003	0.000003	0.00015	0.00012
30	534848	193615	0.00004	0.00006	0.00005	0.0027	0.0023	0.000002	0.000003	0.000002	0.00014	0.00011
31	535109	193782	0.00005	0.00007	0.00006	0.0032	0.0027	0.000002	0.000003	0.000003	0.00016	0.00014
32	535348	193899	0.00005	0.00006	0.00006	0.0030	0.0026	0.000003	0.000003	0.000003	0.00015	0.00013
33	535289	193329	0.00004	0.00010	0.00008	0.0044	0.0036	0.000002	0.000005	0.000004	0.00022	0.00018
34	535774	193917	0.00008	0.00006	0.00005	0.0029	0.0023	0.000004	0.000003	0.000002	0.00014	0.00012
35	535975	193888	0.00010	0.00008	0.00007	0.0039	0.0032	0.000005	0.000004	0.000003	0.00019	0.00016
36	535048	192151	0.00005	0.00003	0.00002	0.0013	0.0010	0.000002	0.000001	0.000001	0.00007	0.00005
37	535108	192015	0.00004	0.00003	0.00002	0.0014	0.0011	0.000002	0.000001	0.000001	0.00007	0.00005
38	535499	191989	0.00004	0.00003	0.00003	0.0016	0.0012	0.000002	0.000002	0.000001	0.00008	0.00006
39	535673	191965	0.00004	0.00004	0.00003	0.0018	0.0014	0.000002	0.000002	0.000001	0.00009	0.00007
40	535743	191924	0.00004	0.00004	0.00003	0.0019	0.0015	0.000002	0.000002	0.000002	0.00010	0.00007
41	535866	191864	0.00005	0.00004	0.00003	0.0020	0.0016	0.000002	0.000002	0.000002	0.00010	0.00008
42	535954	191647	0.00005	0.00004	0.00003	0.0018	0.0014	0.000002	0.000002	0.000002	0.00009	0.00007
43	534991	192230	0.00006	0.00003	0.00002	0.0013	0.0010	0.000003	0.000001	0.000001	0.00007	0.00005
44	534883	192033	0.00005	0.00003	0.00002	0.0013	0.0010	0.000002	0.000001	0.000001	0.00007	0.00005
45	534799	191902	0.00005	0.00003	0.00002	0.0013	0.0010	0.000002	0.000001	0.000001	0.00006	0.00005
46	534813	191648	0.00004	0.00003	0.00002	0.0013	0.0010	0.000002	0.000001	0.000001	0.00006	0.00005
47	534820	191439	0.00004	0.00003	0.00002	0.0012	0.0010	0.000002	0.000001	0.000001	0.00006	0.00005
48	534785	191044	0.00004	0.00002	0.00002	0.0012	0.0009	0.000002	0.000001	0.000001	0.00006	0.00005
49	535877	191031	0.00004	0.00003	0.00002	0.0012	0.0010	0.000002	0.000001	0.000001	0.00006	0.00005
50	535781	190813	0.00004	0.00002	0.00002	0.0011	0.0009	0.000002	0.000001	0.000001	0.00006	0.00005
51	536190	191057	0.00004	0.00003	0.00002	0.0013	0.0010	0.000002	0.000001	0.000001	0.00006	0.00005
52	536543	191108	0.00004	0.00003	0.00002	0.0013	0.0011	0.000002	0.000001	0.000001	0.00007	0.00005
53	535964	190902	0.00004	0.00003	0.00002	0.0012	0.0010	0.000002	0.000001	0.000001	0.00006	0.00005
54	535731	194625	0.00006	0.00004	0.00004	0.0020	0.0017	0.000003	0.000002	0.000002	0.00010	0.00008
55	534858	194334	0.00004	0.00004	0.00004	0.0019	0.0016	0.000002	0.000002	0.000002	0.00009	0.00008
56	534050	193710	0.00003	0.00004	0.00003	0.0017	0.0014	0.000002	0.000002	0.000001	0.00009	0.00007
57	533242	192667	0.00008	0.00005	0.00004	0.0024	0.0021	0.000004	0.000003	0.000002	0.00012	0.00010
58	532942	193649	0.00004	0.00003	0.00003	0.0015	0.0013	0.000002	0.000002	0.000001	0.00008	0.00007
59	533487	194593	0.00002	0.00002	0.00002	0.0011	0.0009	0.000001	0.000001	0.000001	0.00005	0.00005

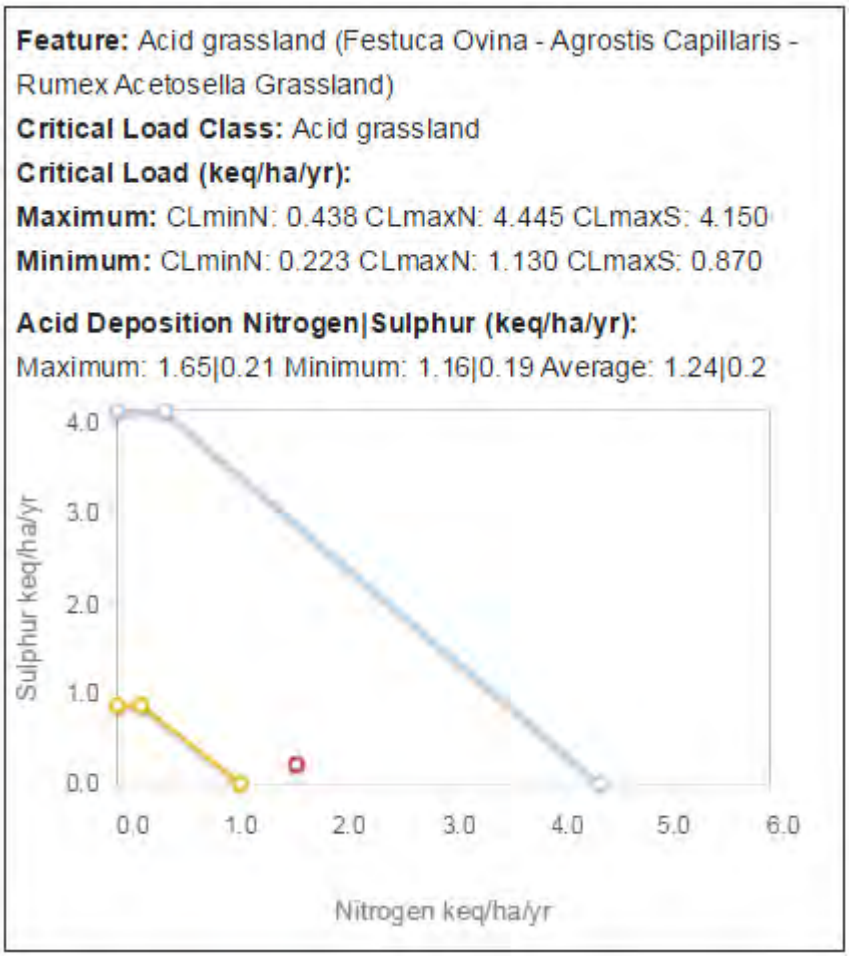
Receptor ID	Grid Reference		Annual average HF process contribution (µg/m^3)					Annual average TI process contribution (µg/m^3)				
			Stage 1	Stage 2		Stages 3/4		Stage 1	Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet FGT	Wet with reheat FGT	Wet FGT	Wet with reheat FGT	Existing EfW facility	Wet FGT	Wet with reheat FGT	Wet FGT	Wet with reheat FGT
60	534092	195241	0.00003	0.00002	0.00002	0.0011	0.0009	0.000001	0.000001	0.000001	0.00005	0.00005
61	535712	195583	0.00004	0.00003	0.00002	0.0013	0.0011	0.000002	0.000001	0.000001	0.00007	0.00006
62	537328	194146	0.00012	0.00009	0.00008	0.0043	0.0037	0.000006	0.000005	0.000004	0.00022	0.00019
63	537769	193667	0.00017	0.00011	0.00010	0.0051	0.0045	0.000008	0.000005	0.000005	0.00026	0.00022
64	537887	193127	0.00014	0.00006	0.00005	0.0029	0.0025	0.000007	0.000003	0.000003	0.00014	0.00013
65	537868	192357	0.00008	0.00005	0.00004	0.0022	0.0019	0.000004	0.000002	0.000002	0.00011	0.00010
66	537868	194945	0.00009	0.00006	0.00005	0.0029	0.0025	0.000004	0.000003	0.000003	0.00015	0.00012
67	538234	194470	0.00010	0.00008	0.00007	0.0035	0.0030	0.000005	0.000004	0.000003	0.00017	0.00015
68	538582	193743	0.00013	0.00007	0.00006	0.0033	0.0030	0.000006	0.000003	0.000003	0.00017	0.00015
69	538859	192695	0.00005	0.00003	0.00003	0.0015	0.0014	0.000003	0.000002	0.000001	0.00007	0.00007
70	537746	192000	0.00007	0.00004	0.00003	0.0019	0.0016	0.000003	0.000002	0.000002	0.00009	0.00008
71	537563	191423	0.00004	0.00003	0.00002	0.0012	0.0010	0.000002	0.000001	0.000001	0.00006	0.00005
72	537290	190671	0.00003	0.00002	0.00002	0.0010	0.0009	0.000002	0.000001	0.000001	0.00005	0.00004
73	536027	190164	0.00003	0.00002	0.00002	0.0010	0.0008	0.000002	0.000001	0.000001	0.00005	0.00004
74	536938	189896	0.00003	0.00002	0.00001	0.0008	0.0007	0.000001	0.000001	0.000001	0.00004	0.00003
75	535938	189488	0.00003	0.00002	0.00001	0.0008	0.0007	0.000001	0.000001	0.000001	0.00004	0.00003
76	537962	190521	0.00003	0.00002	0.00002	0.0009	0.0007	0.000001	0.000001	0.000001	0.00004	0.00004
77	538352	191263	0.00004	0.00002	0.00002	0.0011	0.0009	0.000002	0.000001	0.000001	0.00006	0.00005
78	538685	192418	0.00005	0.00003	0.00003	0.0016	0.0014	0.000003	0.000002	0.000001	0.00008	0.00007
79	534675	190549	0.00004	0.00002	0.00002	0.0011	0.0009	0.000002	0.000001	0.000001	0.00005	0.00004
80	533951	191028	0.00003	0.00002	0.00002	0.0009	0.0007	0.000002	0.000001	0.000001	0.00005	0.00004
81	533895	191855	0.00006	0.00003	0.00002	0.0014	0.0011	0.000003	0.000001	0.000001	0.00007	0.00006
82	533843	192259	0.00008	0.00004	0.00004	0.0020	0.0016	0.000004	0.000002	0.000002	0.00010	0.00008
83	533017	192315	0.00007	0.00004	0.00003	0.0019	0.0016	0.000003	0.000002	0.000002	0.00009	0.00008
84	532801	191780	0.00005	0.00003	0.00002	0.0013	0.0011	0.000003	0.000001	0.000001	0.00007	0.00006
85	533336	191385	0.00004	0.00002	0.00002	0.0011	0.0009	0.000002	0.000001	0.000001	0.00005	0.00004
86	533458	190512	0.00003	0.00002	0.00001	0.0008	0.0006	0.000001	0.000001	0.000001	0.00004	0.00003
87	534238	190267	0.00003	0.00002	0.00002	0.0009	0.0008	0.000001	0.000001	0.000001	0.00005	0.00004
88	533980	189845	0.00003	0.00002	0.00002	0.0008	0.0007	0.000001	0.000001	0.000001	0.00004	0.00003
89	537511	192655	0.00010	0.00006	0.00005	0.0029	0.0025	0.000005	0.000003	0.000003	0.00014	0.00013
90	534361	194275	0.00003	0.00003	0.00003	0.0016	0.0013	0.000002	0.000002	0.000001	0.00008	0.00007
91	535048	194871	0.00003	0.00003	0.00003	0.0014	0.0012	0.000002	0.000002	0.000001	0.00007	0.00006

Receptor ID	Grid Reference		Annual average HF process contribution (µg/m^3)					Annual average TI process contribution (µg/m^3)				
			Stage 1	Stage 2		Stages 3/4		Stage 1	Stage 2		Stages 3/4	
	X	Y	Existing EfW facility	Wet FGT	Wet with reheat FGT	Wet FGT	Wet with reheat FGT	Existing EfW facility	Wet FGT	Wet with reheat FGT	Wet FGT	Wet with reheat FGT
92	535557	191578	0.00005	0.00003	0.00003	0.0015	0.0012	0.000002	0.000002	0.000001	0.00008	0.00006
93	534953	191953	0.00004	0.00003	0.00002	0.0013	0.0010	0.000002	0.000001	0.000001	0.00007	0.00005
E1	536126	193021	0.00008	0.00006	0.00004	0.0028	0.0020	0.000004	0.000003	0.000002	0.00014	0.00010
E2	536179	193231	0.00013	0.00010	0.00008	0.0045	0.0035	0.000007	0.000005	0.000004	0.00023	0.00017
E3	536273	193493	0.00016	0.00011	0.00009	0.0052	0.0042	0.000008	0.000005	0.000004	0.00026	0.00021
E4	536284	192905	0.00015	0.00011	0.00009	0.0051	0.0040	0.000007	0.000005	0.000004	0.00025	0.00020
E5	536462	192863	0.00021	0.00012	0.00010	0.0057	0.0047	0.000010	0.000006	0.000005	0.00028	0.00023
E6	538006	194754	0.00009	0.00007	0.00006	0.0031	0.0026	0.000005	0.000003	0.000003	0.00015	0.00013
E7	538132	195584	0.00008	0.00005	0.00005	0.0025	0.0021	0.000004	0.000003	0.000002	0.00012	0.00010
E8	539540	194628	0.00009	0.00006	0.00006	0.0028	0.0026	0.000004	0.000003	0.000003	0.00014	0.00013
E9	539498	193756	0.00009	0.00005	0.00004	0.0021	0.0019	0.000004	0.000002	0.000002	0.00010	0.00009
E10	539099	192622	0.00005	0.00003	0.00003	0.0014	0.0012	0.000002	0.000001	0.000001	0.00007	0.00006
E11	538700	190899	0.00003	0.00002	0.00002	0.0009	0.0008	0.000002	0.000001	0.000001	0.00005	0.00004
E12	535433	190794	0.00004	0.00002	0.00002	0.0011	0.0009	0.000002	0.000001	0.000001	0.00006	0.00004

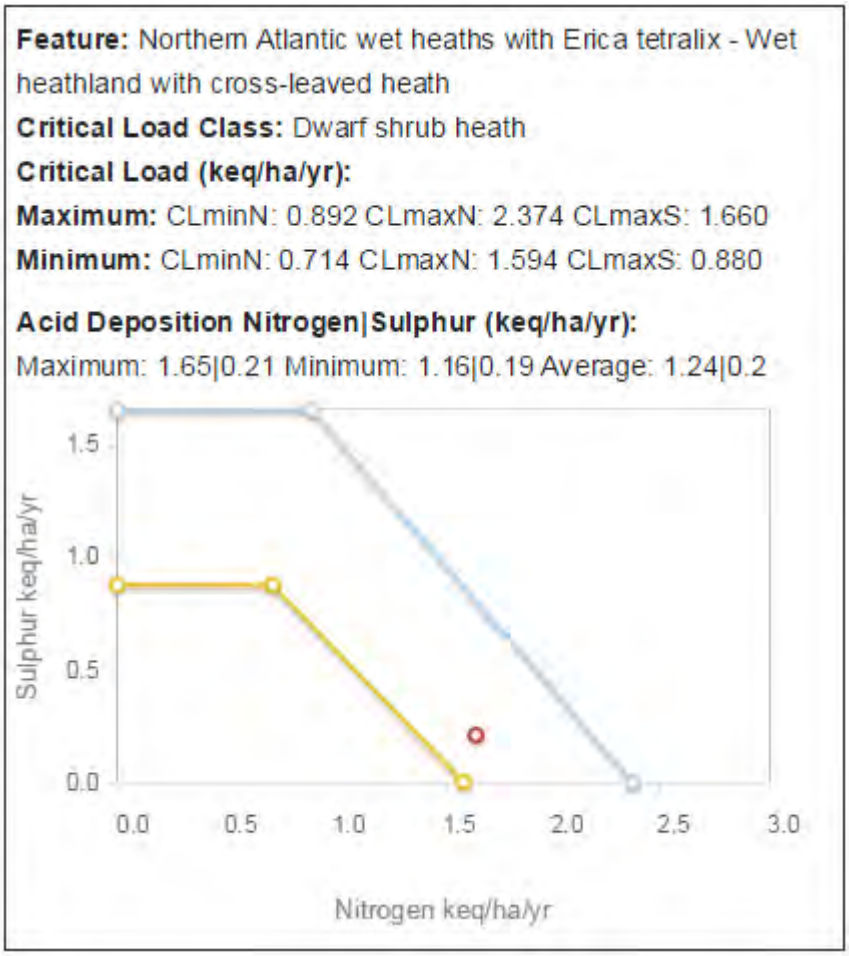
Vol 2 Appendix 2.2 Plate 1: Chingford Reservoirs SSSI Acidity Critical Loads



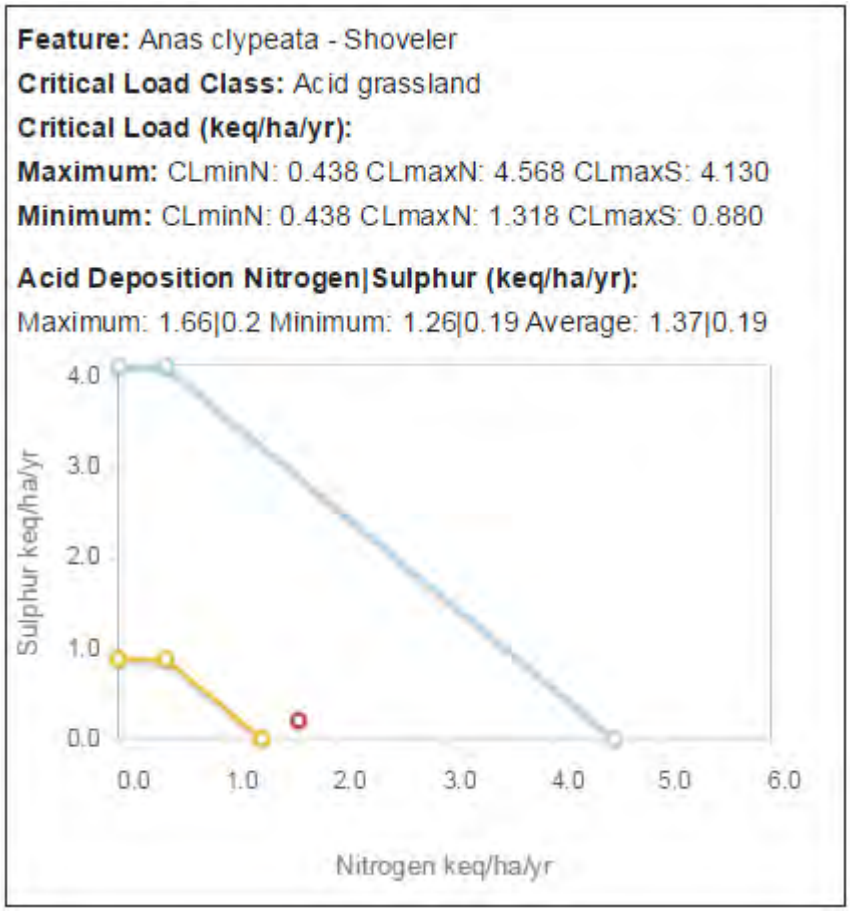
Vol 2 Appendix 2.2 Plate 2: Epping Forest SSSI Acidity Critical Loads



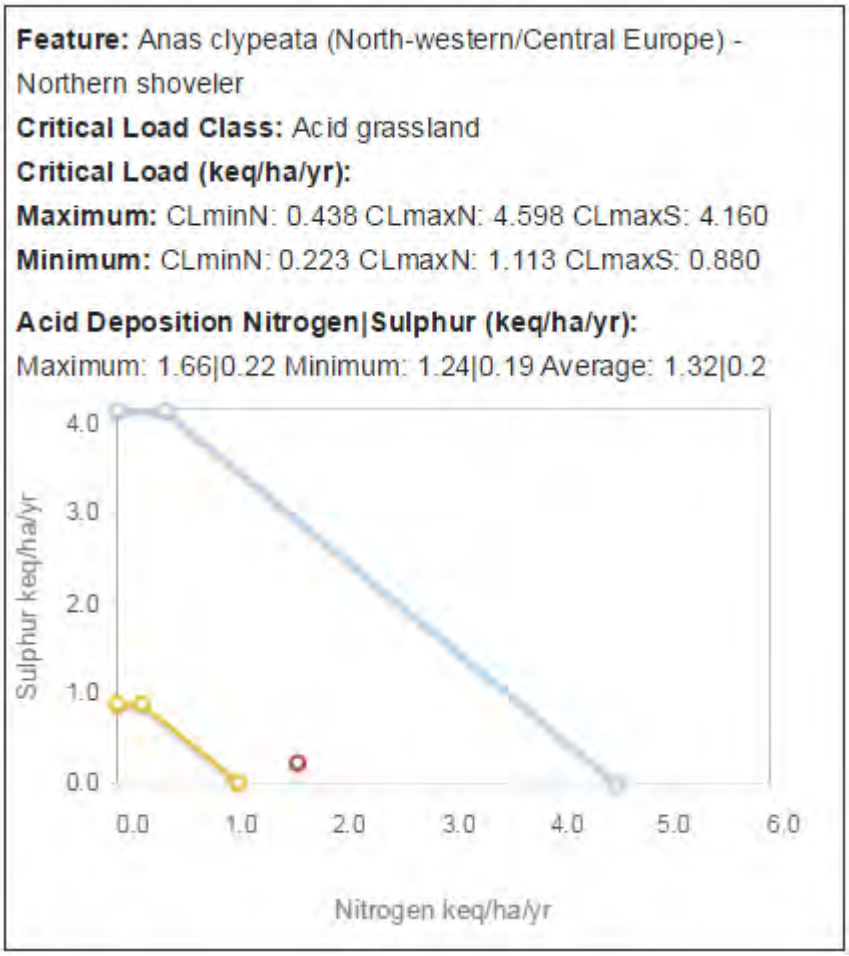
Vol 2 Appendix 2.2 Plate 3: Epping Forest SAC Acidity Critical Loads



Vol 2 Appendix 2.2 Plate 4: Walthamstow Reservoir SSSI Acidity Critical Loads



Vol 2 Appendix 2.2 Plate 5: Lee Valley SPA/RAMSAR Acidity Critical Loads



Vol 2 Appendix 2.2 Table 24: Predicted NO_x concentrations at sensitive ecological sites, comparison with the critical level during Stage 1 and transition (Stage 2)

Ecological Receptor ID	Receptor Location	Stage 1				Stage 2				Stage 2			
		Existing EfW facility				EfW facility /ERF Wet FGT				EfW facility /ERF Wet with reheat FGT			
		Mod NO_x	Tot NO_x	1 per cent test	70 per cent test	Mod NO_x	Tot NO_x	1 per cent test	70 per cent test	Mod NO_x	Tot NO_x	1 per cent test	70 per cent test
1	Chingford Reservoirs SSSI	0.5	37.0	1.6	123	0.5	37.0	1.7	123	0.4	36.9	1.4	123
2	Chingford Reservoirs SSSI	0.8	37.3	2.6	124	0.8	37.3	2.6	124	0.7	37.2	2.2	124
3	Chingford Reservoirs SSSI	0.9	37.4	3.1	125	0.9	37.4	3.1	125	0.8	37.3	2.6	124
4	Chingford Reservoirs SSSI	0.9	44.6	2.9	149	0.9	44.7	2.9	149	0.7	44.5	2.5	148
5	Chingford Reservoirs SSSI	1.2	45.0	4.0	150	1.0	44.8	3.5	149	0.9	44.7	3.1	149
6	Epping Forest SSSI	0.5	34.4	1.8	115	0.5	34.4	1.8	115	0.5	34.4	1.6	115
7	Epping Forest SSSI	0.4	29.3	1.5	98	0.4	29.3	1.4	98	0.4	29.3	1.3	98
8	Epping Forest SSSI	0.5	32.0	1.7	107	0.5	32.0	1.6	107	0.5	31.9	1.5	106
9	Epping Forest SSSI	0.5	33.8	1.7	113	0.4	33.7	1.3	112	0.4	33.7	1.3	112
10	Epping Forest SSSI	0.3	35.7	0.9	119	0.2	35.6	0.8	119	0.2	35.6	0.8	119
11	Epping Forest SSSI	0.2	50.3	0.6	168	0.2	50.3	0.6	168	0.1	50.3	0.5	168
6	Epping Forest SAC	0.5	34.4	1.8	115	0.5	34.4	1.8	115	0.5	34.4	1.6	115
7	Epping Forest SAC	0.4	29.3	1.5	98	0.4	29.3	1.4	98	0.4	29.3	1.3	98
8	Epping Forest SAC	0.5	32.0	1.7	107	0.5	32.0	1.6	107	0.5	31.9	1.5	106
9	Epping Forest SAC	0.5	33.8	1.7	113	0.4	33.7	1.3	112	0.4	33.7	1.3	112
10	Epping Forest SAC	0.3	35.7	0.9	119	0.2	35.6	0.8	119	0.2	35.6	0.8	119
11	Epping Forest SAC	0.2	50.3	0.6	168	0.2	50.3	0.6	168	0.1	50.3	0.5	168
12	Walthamstow Reservoirs SSSI	0.2	42.6	0.7	142	0.2	42.5	0.7	142	0.2	42.5	0.6	142
12	Lee Valley SPA	0.2	42.6	0.7	142	0.2	42.5	0.7	142	0.2	42.5	0.6	142

Vol 2 Appendix 2.2 Table 25: Predicted NOx concentrations at sensitive ecological sites, comparison with the critical level during operation (Stage 3/4)

Ecological Receptor ID	Receptor Location	Stage 3/4				Stage 3/4			
		ERF Wet FGT				ERF Wet with reheat FGT			
		Mod NO_X	Tot NO_X	1 per cent test	70 per cent test	Mod NO_X	Tot NO_X	1 per cent test	70 per cent test
1	Chingford Reservoirs SSSI	0.7	37.2	2.4	124	0.7	37.1	2.2	124
2	Chingford Reservoirs SSSI	0.7	37.2	2.3	124	0.6	37.1	2.0	124
3	Chingford Reservoirs SSSI	0.6	37.1	2.0	124	0.5	37.0	1.8	123
4	Chingford Reservoirs SSSI	0.7	44.4	2.2	148	0.6	44.3	1.9	148
5	Chingford Reservoirs SSSI	0.6	44.4	2.0	148	0.5	44.3	1.7	148
6	Epping Forest SSSI	0.3	34.2	1.0	114	0.3	34.2	0.9	114
7	Epping Forest SSSI	0.2	29.1	0.8	97	0.2	29.1	0.7	97
8	Epping Forest SSSI	0.3	31.7	0.8	106	0.2	31.7	0.8	106
9	Epping Forest SSSI	0.2	33.5	0.6	112	0.2	33.5	0.6	112
10	Epping Forest SSSI	0.1	35.5	0.4	118	0.1	35.5	0.4	118
11	Epping Forest SSSI	0.1	50.2	0.3	167	0.1	50.2	0.3	167
6	Epping Forest SAC	0.3	34.2	1.0	114	0.3	34.2	0.9	114
7	Epping Forest SAC	0.2	29.1	0.8	97	0.2	29.1	0.7	97
8	Epping Forest SAC	0.3	31.7	0.8	106	0.2	31.7	0.8	106
9	Epping Forest SAC	0.2	33.5	0.6	112	0.2	33.5	0.6	112
10	Epping Forest SAC	0.1	35.5	0.4	118	0.1	35.5	0.4	118
11	Epping Forest SAC	0.1	50.2	0.3	167	0.1	50.2	0.3	167
12	Walthamstow Reservoirs SSSI	0.1	42.5	0.4	142	0.1	42.4	0.3	141
12	Lee Valley SPA	0.1	42.5	0.4	142	0.1	42.4	0.3	141

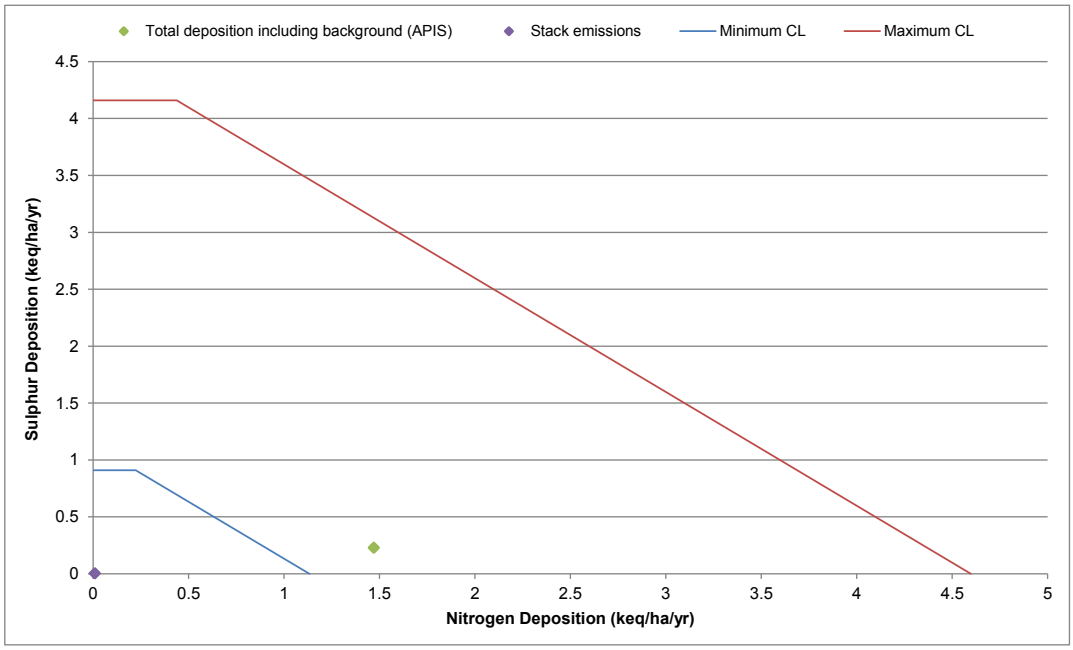
Vol 2 Appendix 2.2 Table 26: Predicted SO_2 concentrations at sensitive ecological sites, comparison with the critical level for the existing EfW and transition stage (Stage 2)

Ecological Receptor ID	Receptor Location	Stage 1				Stage 2				Stage 2			
		Existing EfW facility				EfW facility /ERF Wet FGT				EfW facility /ERF Wet with reheat FGT			
		Mod SO_2	Tot SO_2	1 per cent test	70 per cent test	Mod SO_2	Tot SO_2	1 per cent test	70 per cent test	Mod SO_2	Tot SO_2	1 per cent test	70 per cent test
1	Chingford Reservoirs SSSI	0.01	4.5	0.07	22.6	0.02	4.5	0.12	22.6	0.02	4.5	0.08	22.6
2	Chingford Reservoirs SSSI	0.02	4.5	0.12	22.6	0.04	4.5	0.19	22.7	0.03	4.5	0.14	22.6
3	Chingford Reservoirs SSSI	0.03	4.5	0.14	22.6	0.04	4.5	0.21	22.7	0.03	4.5	0.17	22.7
4	Chingford Reservoirs SSSI	0.03	5.1	0.13	25.3	0.04	5.1	0.21	25.4	0.03	5.1	0.16	25.4
5	Chingford Reservoirs SSSI	0.04	5.1	0.18	25.4	0.05	5.1	0.23	25.4	0.04	5.1	0.19	25.4
6	Epping Forest SSSI	0.02	5.5	0.08	27.4	0.03	5.5	0.13	27.4	0.02	5.5	0.11	27.4
7	Epping Forest SSSI	0.01	4.3	0.07	21.6	0.02	4.3	0.10	21.6	0.02	4.3	0.09	21.6
8	Epping Forest SSSI	0.02	4.9	0.08	24.5	0.02	4.9	0.12	24.6	0.02	4.9	0.11	24.6
9	Epping Forest SSSI	0.02	4.3	0.08	21.6	0.02	4.3	0.09	21.6	0.02	4.3	0.08	21.6
10	Epping Forest SSSI	0.01	4.3	0.04	21.6	0.01	4.3	0.06	21.6	0.01	4.3	0.05	21.6
11	Epping Forest SSSI	0.01	4.7	0.03	23.5	0.01	4.7	0.04	23.5	0.01	4.7	0.03	23.5
6	Epping Forest SAC	0.02	5.5	0.08	27.4	0.03	5.5	0.13	27.4	0.02	5.5	0.11	27.4
7	Epping Forest SAC	0.01	4.3	0.07	21.6	0.02	4.3	0.10	21.6	0.02	4.3	0.09	21.6
8	Epping Forest SAC	0.02	4.9	0.08	24.5	0.02	4.9	0.12	24.6	0.02	4.9	0.11	24.6
9	Epping Forest SAC	0.02	4.3	0.08	21.6	0.02	4.3	0.09	21.6	0.02	4.3	0.08	21.6
10	Epping Forest SAC	0.01	4.3	0.04	21.6	0.01	4.3	0.06	21.6	0.01	4.3	0.05	21.6
11	Epping Forest SAC	0.01	4.7	0.03	23.5	0.01	4.7	0.04	23.5	0.01	4.7	0.03	23.5
12	Walthamstow Reservoirs SSSI	0.01	5.1	0.03	25.3	0.01	5.1	0.05	25.3	0.01	5.1	0.04	25.3
12	Lee Valley SPA	0.01	5.1	0.03	25.3	0.01	5.1	0.05	25.3	0.01	5.1	0.04	25.3

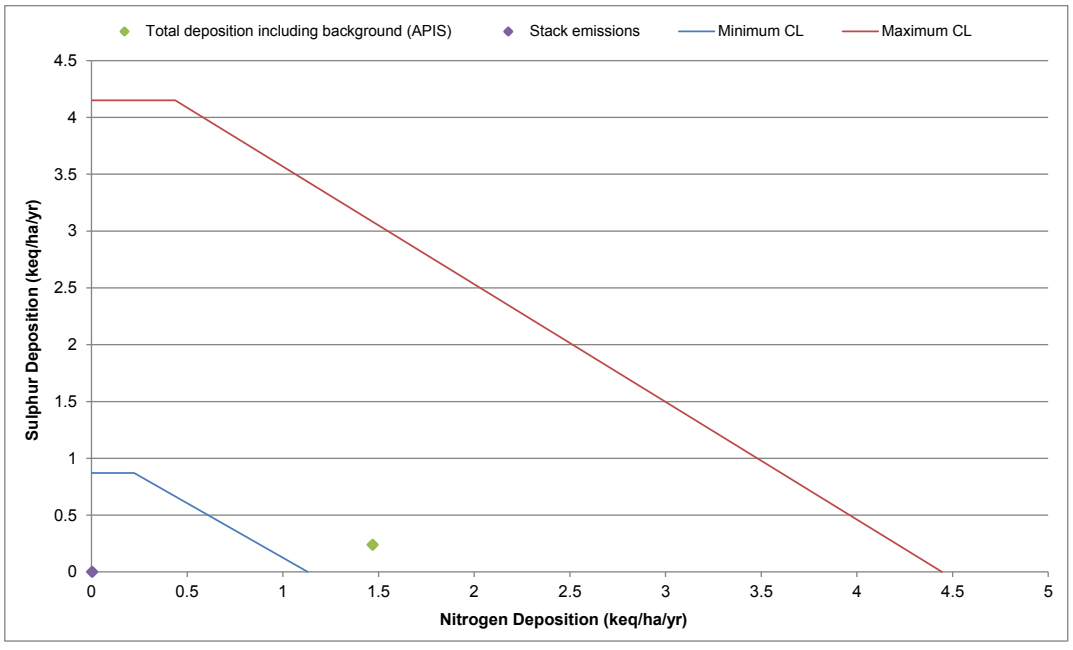
Vol 2 Appendix 2.2 Table 27: Predicted SO_2 concentrations at sensitive ecological sites, comparison with the critical level during operation (Stage 3/4)

Ecological Receptor ID	Receptor Location	Stage 3/4				Stage 3/4			
		ERF Wet FGT				ERF Wet with reheat FGT			
		Mod SO_2	Tot SO_2	1 per cent test	70 per cent test	Mod SO_2	Tot SO_2	1 per cent test	70 per cent test
1	Chingford Reservoirs SSSI	0.02	4.5	0.10	22.6	0.01	4.5	0.07	22.6
2	Chingford Reservoirs SSSI	0.03	4.5	0.16	22.7	0.02	4.5	0.12	22.6
3	Chingford Reservoirs SSSI	0.04	4.5	0.18	22.7	0.03	4.5	0.15	22.6
4	Chingford Reservoirs SSSI	0.04	5.1	0.18	25.4	0.03	5.1	0.14	25.3
5	Chingford Reservoirs SSSI	0.04	5.1	0.20	25.4	0.03	5.1	0.16	25.4
6	Epping Forest SSSI	0.02	5.5	0.11	27.4	0.02	5.5	0.09	27.4
7	Epping Forest SSSI	0.02	4.3	0.09	21.6	0.01	4.3	0.07	21.6
8	Epping Forest SSSI	0.02	4.9	0.10	24.5	0.02	4.9	0.09	24.5
9	Epping Forest SSSI	0.01	4.3	0.07	21.6	0.01	4.3	0.07	21.6
10	Epping Forest SSSI	0.01	4.3	0.05	21.6	0.01	4.3	0.04	21.6
11	Epping Forest SSSI	0.01	4.7	0.03	23.5	0.01	4.7	0.03	23.5
6	Epping Forest SAC	0.02	5.5	0.11	27.4	0.02	5.5	0.09	27.4
7	Epping Forest SAC	0.02	4.3	0.09	21.6	0.01	4.3	0.07	21.6
8	Epping Forest SAC	0.02	4.9	0.10	24.5	0.02	4.9	0.09	24.5
9	Epping Forest SAC	0.01	4.3	0.07	21.6	0.01	4.3	0.07	21.6
10	Epping Forest SAC	0.01	4.3	0.05	21.6	0.01	4.3	0.04	21.6
11	Epping Forest SAC	0.01	4.7	0.03	23.5	0.01	4.7	0.03	23.5
12	Walthamstow Reservoirs SSSI	0.01	5.1	0.04	25.3	0.01	5.1	0.03	25.3
12	Lee Valley SPA	0.01	5.1	0.04	25.3	0.01	5.1	0.03	25.3

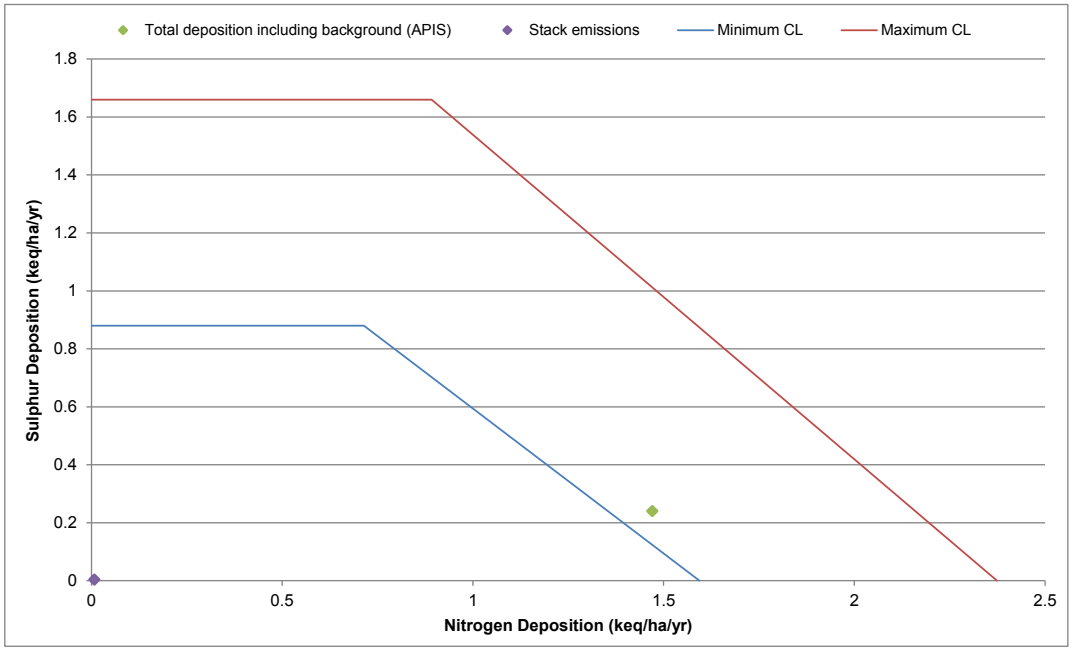
Vol 2 Appendix 2.2 Plate 6: Existing EfW facility stack emissions Chingford SSSI



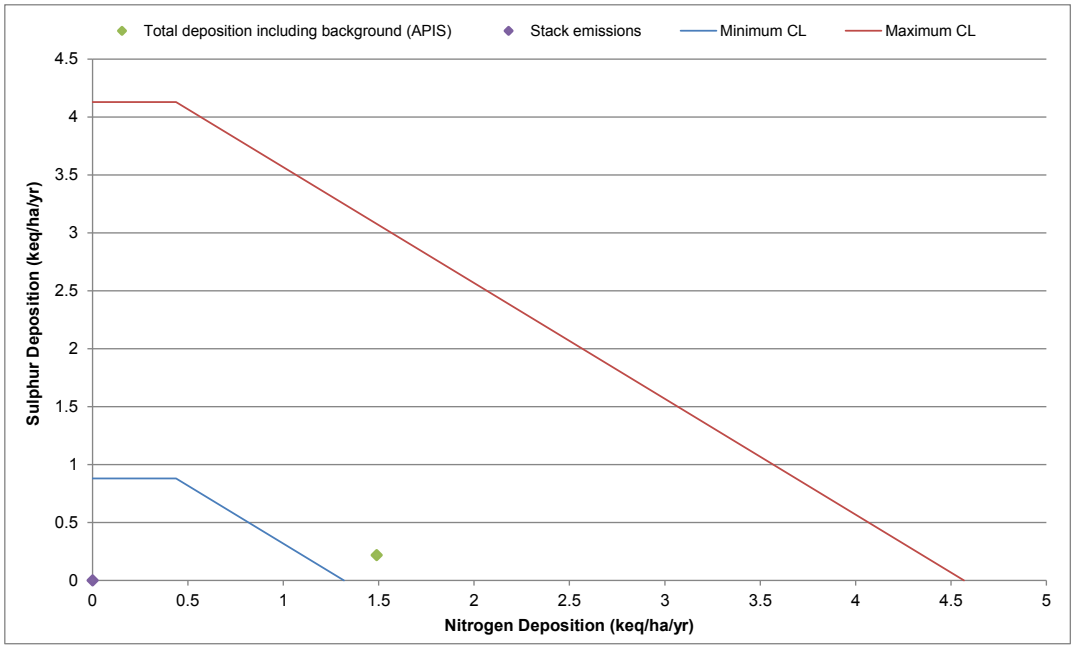
Vol 2 Appendix 2.2 Plate 7: Existing EfW facility stack emissions Epping Forest SSSI



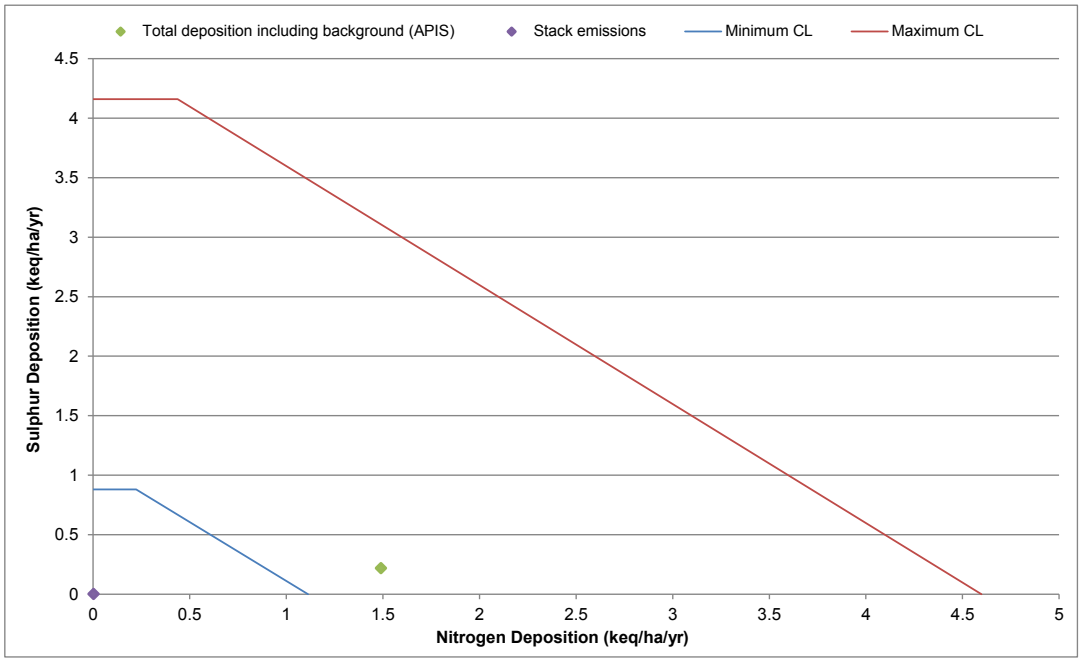
Vol 2 Appendix 2.2 Plate 8: Existing EfW facility stack emissions Epping Forest SAC



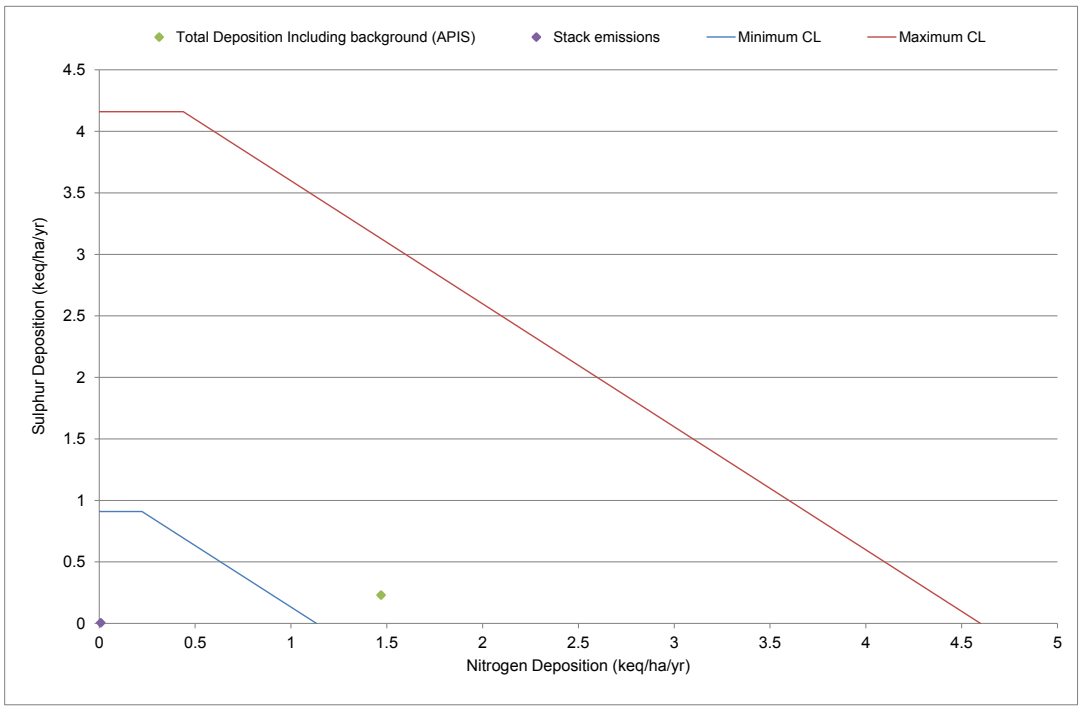
Vol 2 Appendix 2.2 Plate 9: Existing EfW facility stack emissions Walthamstow Reservoir SSSI



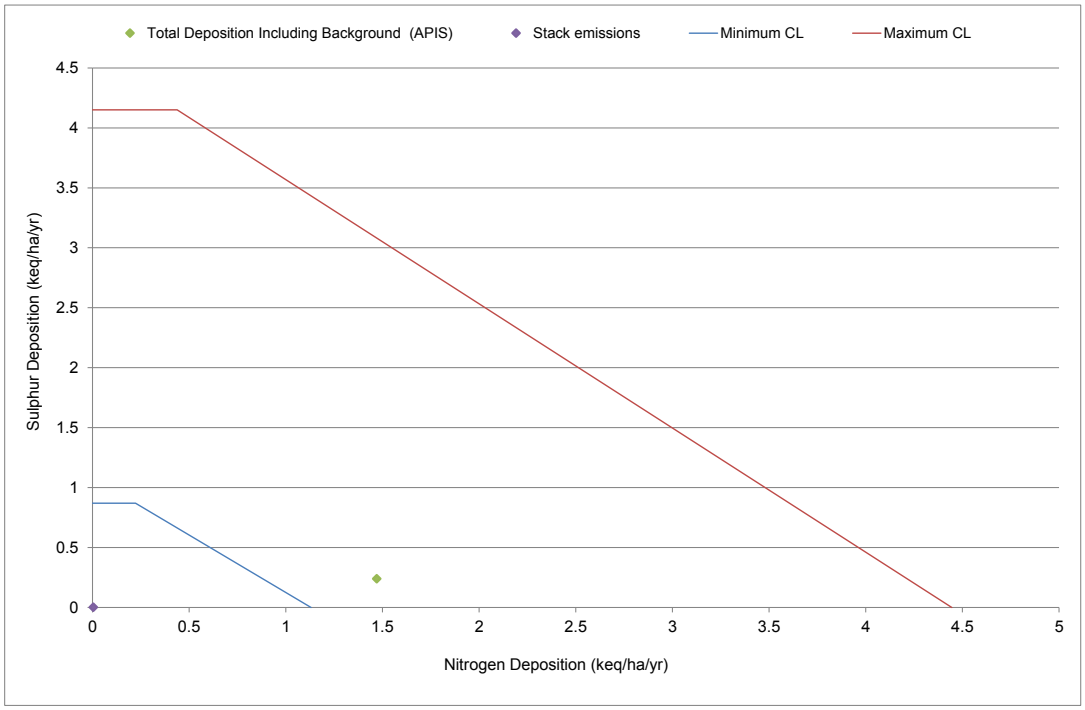
Vol 2 Appendix 2.2 Plate 10: Existing EfW facility stack emissions Lee Valley SPA/RAMSAR



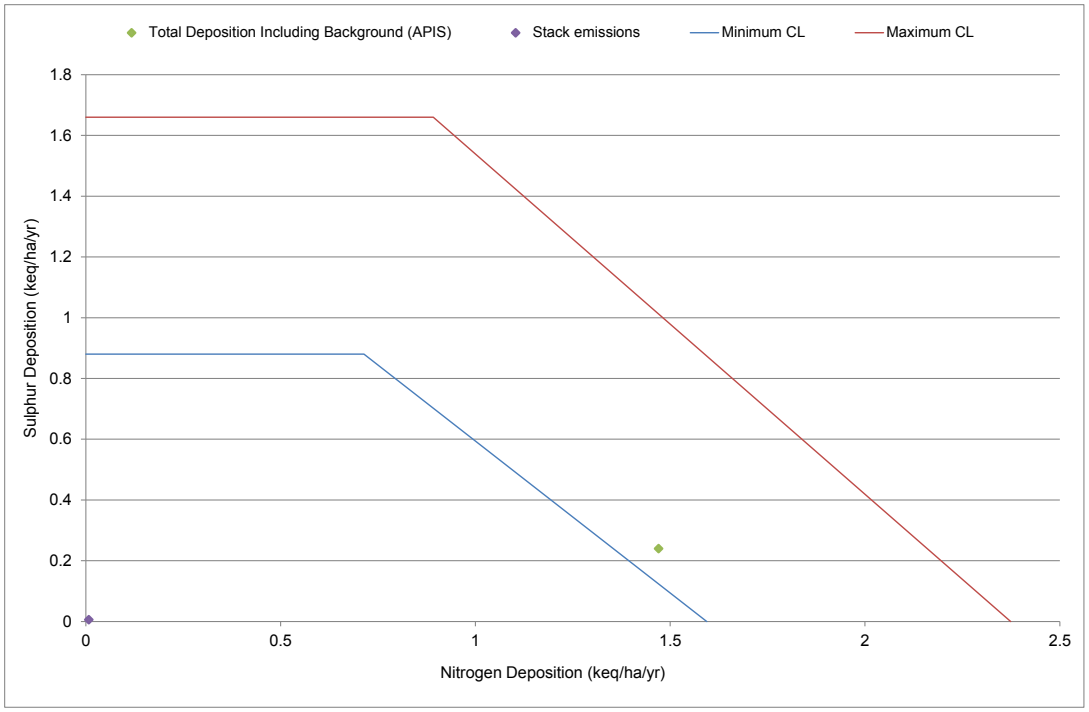
Vol 2 Appendix 2.2 Plate 11: Wet FGT stack emissions Chingford SSSI during transition (Stage 2)



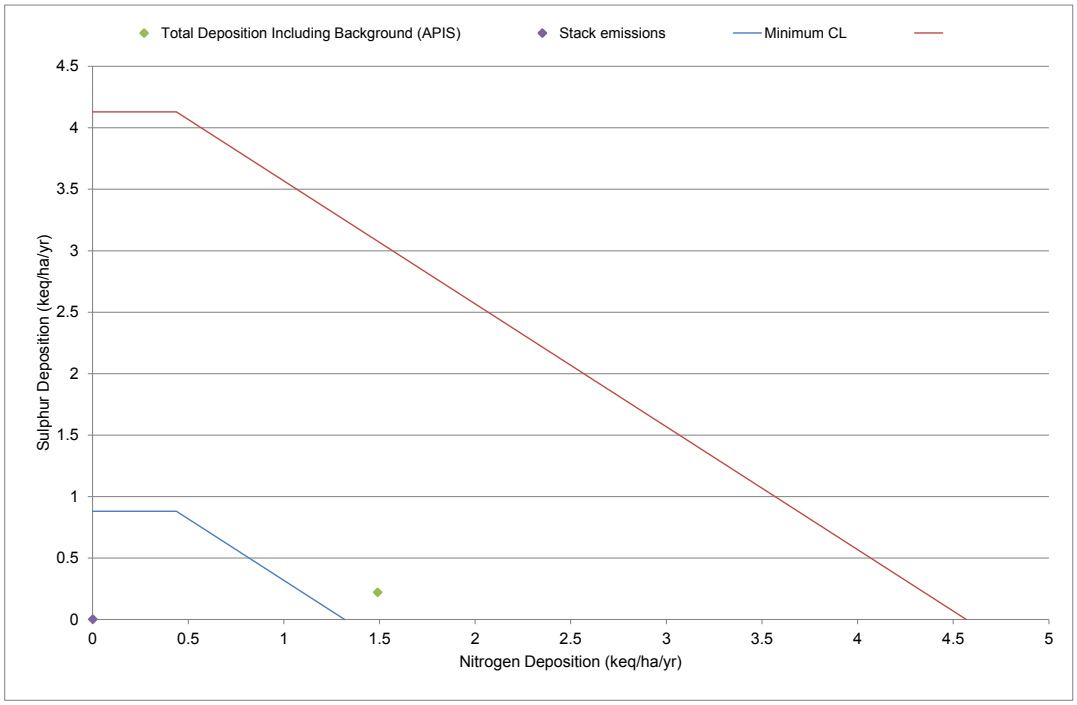
Vol 2 Appendix 2.2 Plate 12: Wet FGT emissions Epping Forest SSSI during transition (Stage 2)



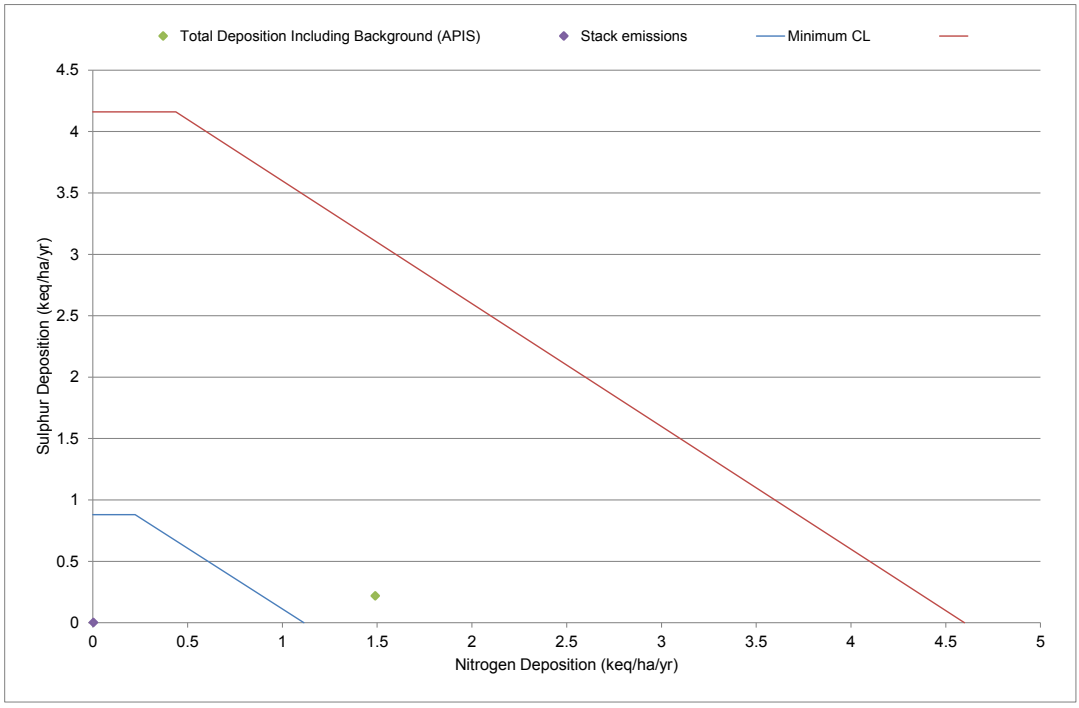
Vol 2 Appendix 2.2 Plate 13: Wet FGT emissions Epping Forest SAC during transition (Stage 2)



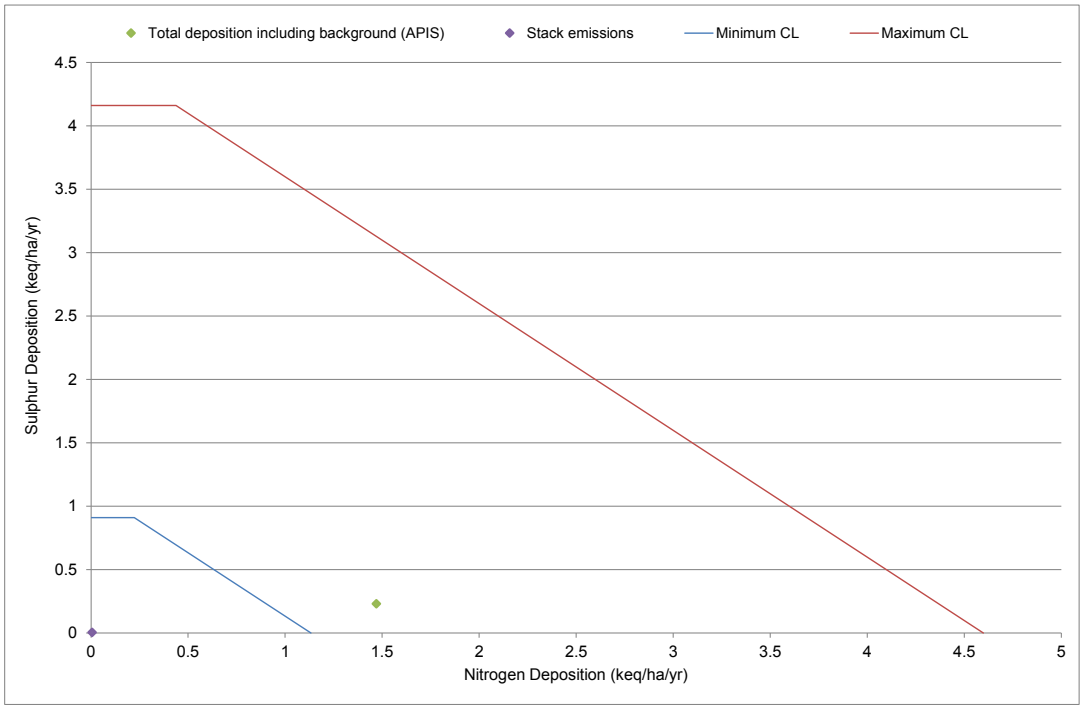
Vol 2 Appendix 2.2 Plate 14: Wet FGT emissions Walthamstow Reservoir SSSI during transition (Stage 2)



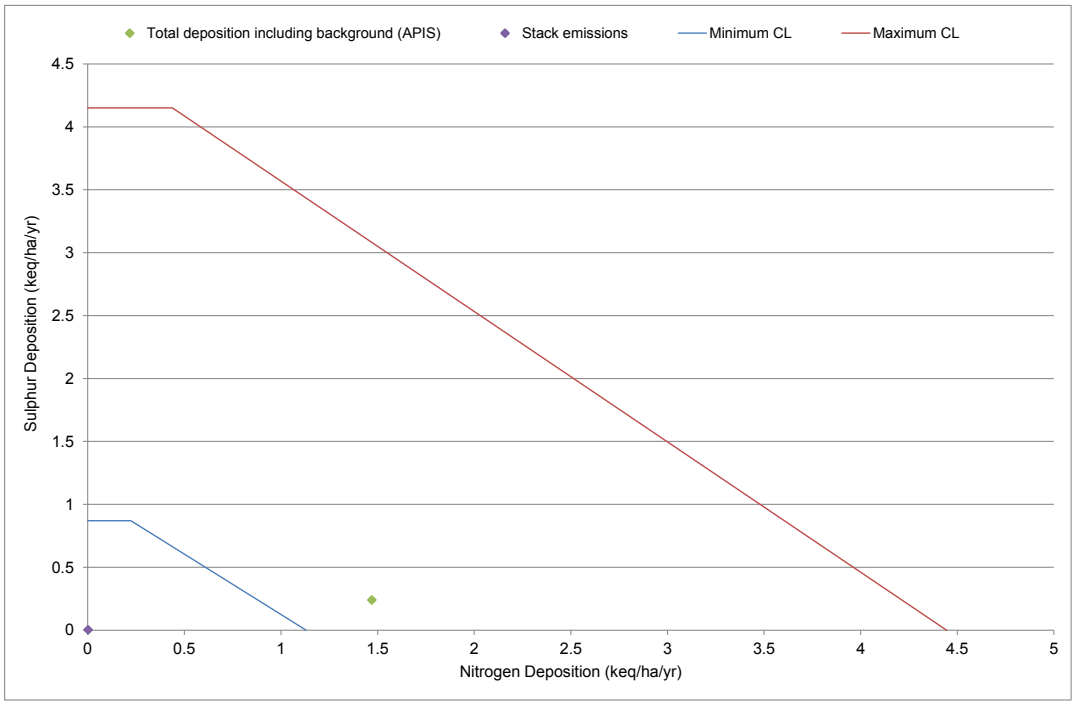
Vol 2 Appendix 2.2 Plate 15: Wet FGT emissions Lee Valley SPA/RAMSAR during transition (stage 2)



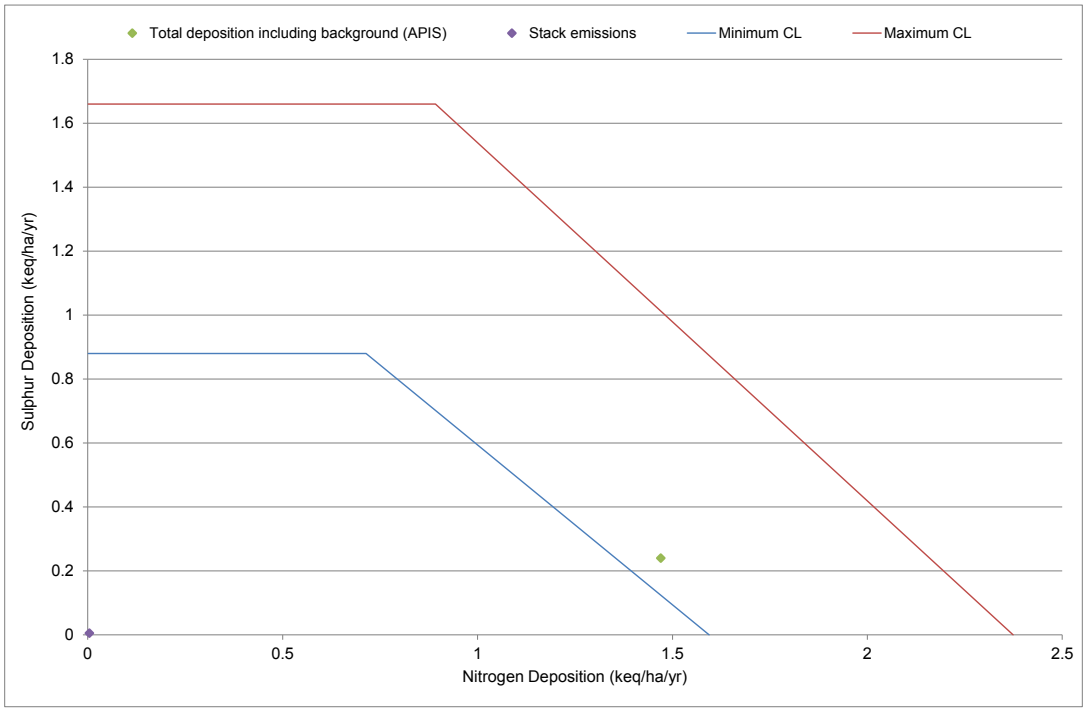
Vol 2 Appendix 2.2 Plate 16: Wet FGT stack emissions Chingford SSSI during operation (Stage 3/4)



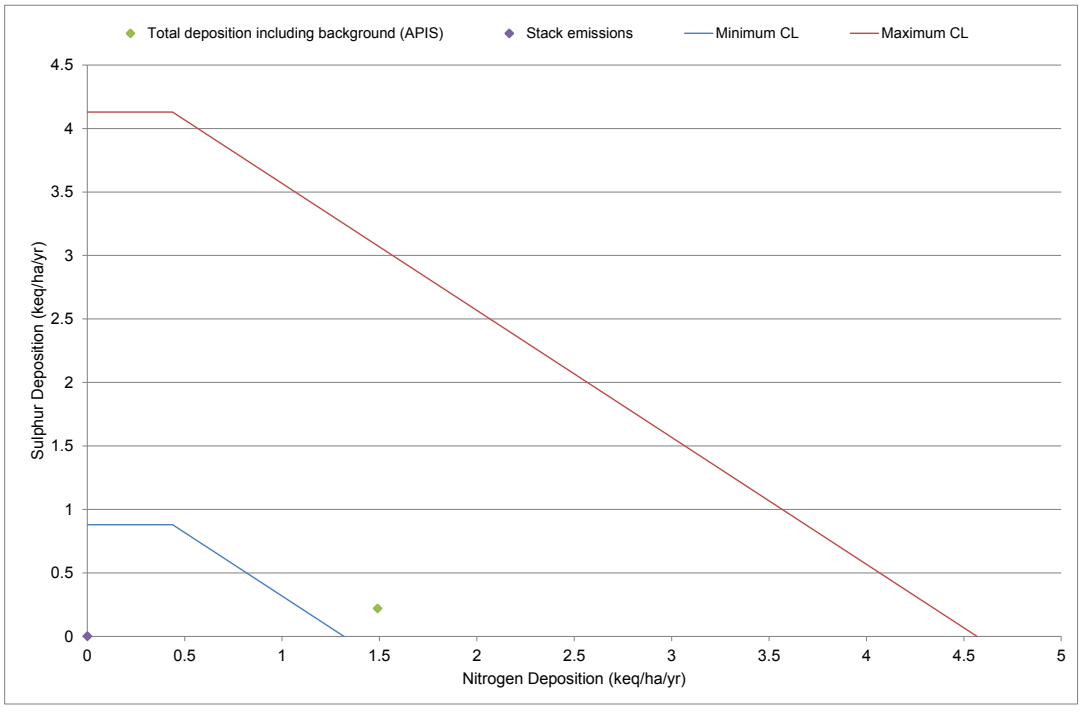
Vol 2 Appendix 2.2 Plate 17: Wet FGT emissions Epping Forest SSSI during operation (Stage 3/4)



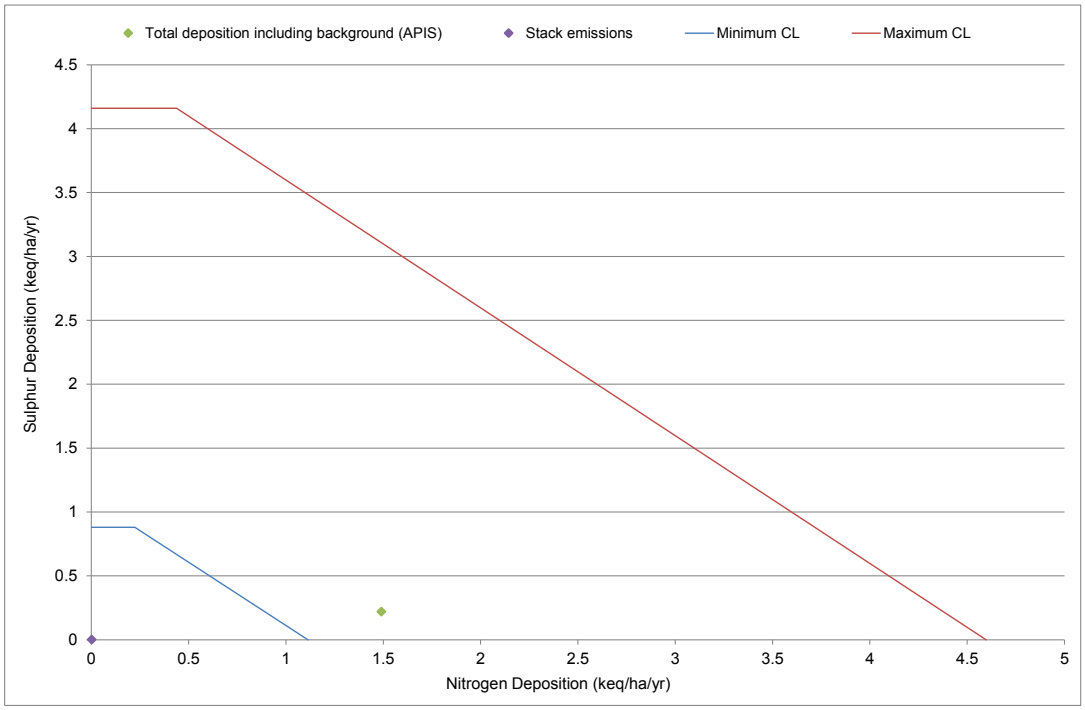
Vol 2 Appendix 2.2 Plate 18: Wet FGT emissions Epping Forest SAC during operation (Stage 3/4)



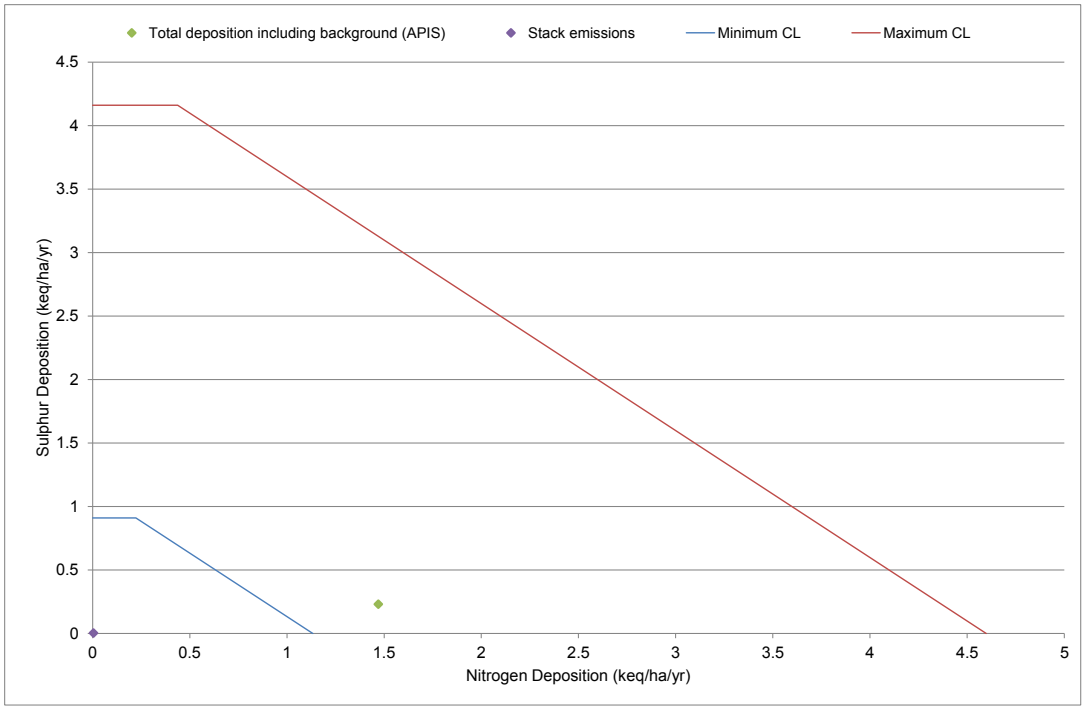
Vol 2 Appendix 2.2 Plate 19: Wet FGT emissions Walthamstow Reservoir SSSI during operation (Stage 3/4)



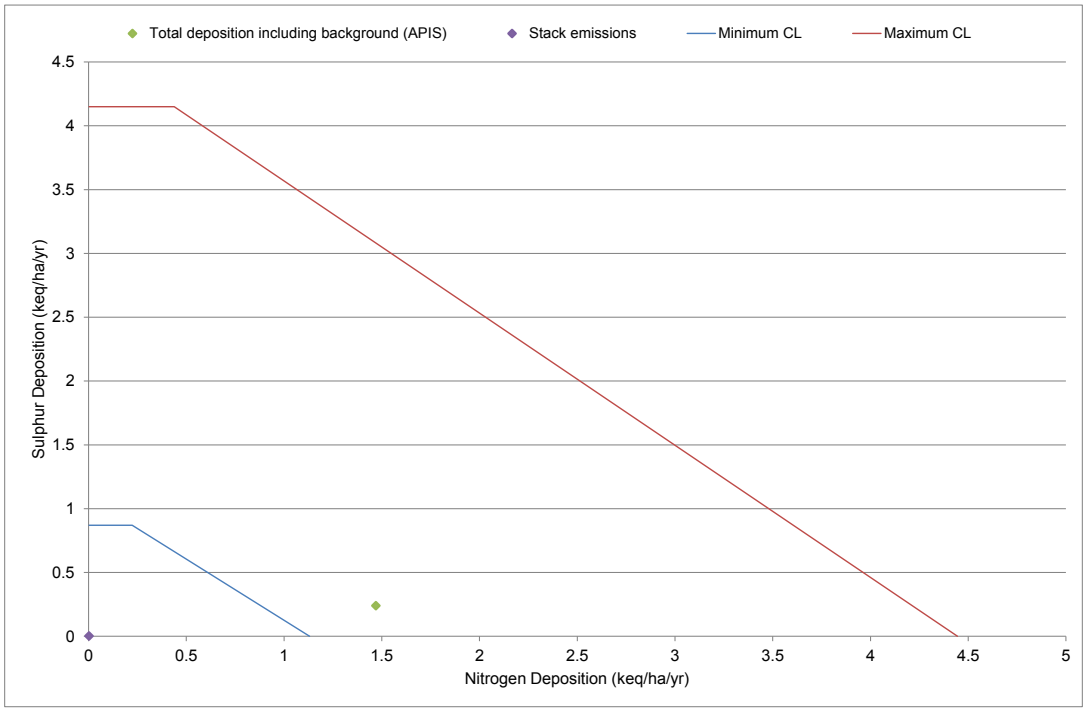
Vol 2 Appendix 2.2 Plate 20: Wet FGT emissions Lee Valley SPA/RAMSAR during operation (Stage 3/4)



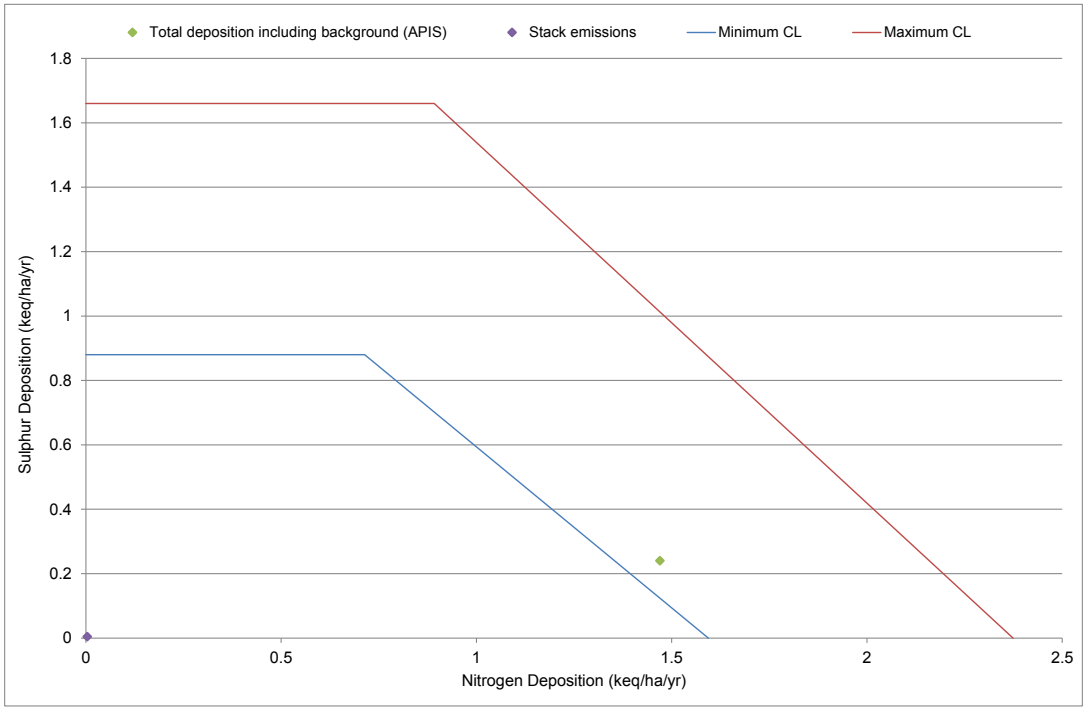
Vol 2 Appendix 2.2 Plate 21: Wet with reheat FGT stack emissions Chingford SSSI during operation (Stage 3/4)



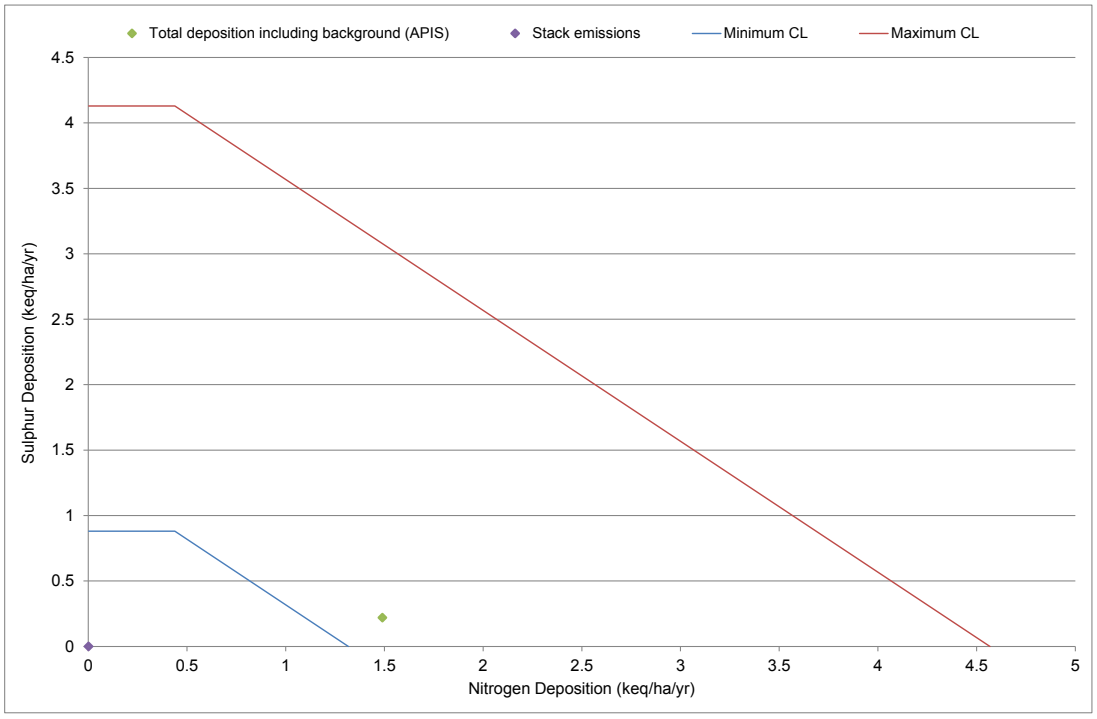
Vol 2 Appendix 2.2 Plate 22: Wet with reheat FGT emissions Epping Forest SSSI during operation (Stage 3/4)



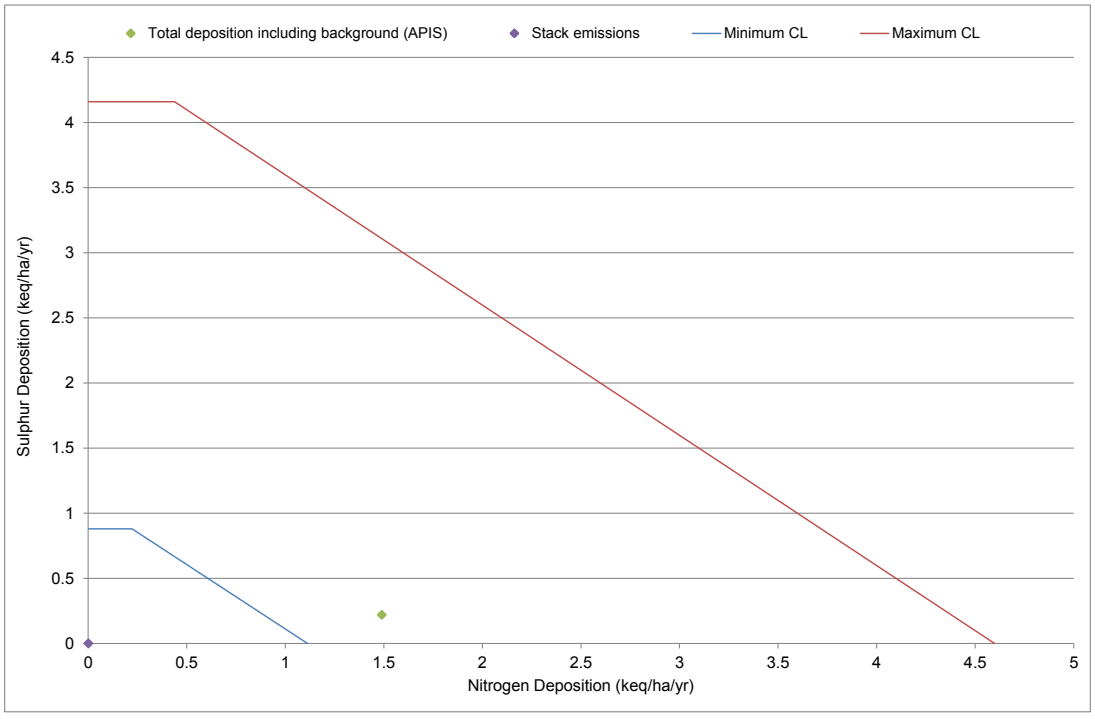
Vol 2 Appendix 2.2 Plate 23: Wet with reheat FGT emissions Epping Forest SAC during operation (Stage 3/4)



Vol 2 Appendix 2.2 Plate 24: Wet with reheat FGT emissions Walthamstowe Reservoir SSSI during operation (Stage 3/4)



Vol 2 Appendix 2.2 Plate 25: Wet with reheat FGT emissions Lee Valley SPA/RAMSAR during operation (Stage 3/4)



NORTH LONDON WASTE AUTHORITY

NORTH LONDON HEAT AND POWER PROJECT

ENVIRONMENTAL STATEMENT: VOLUME 2 APPENDIX 2.3 HUMAN HEALTH RISK ASSESSMENT

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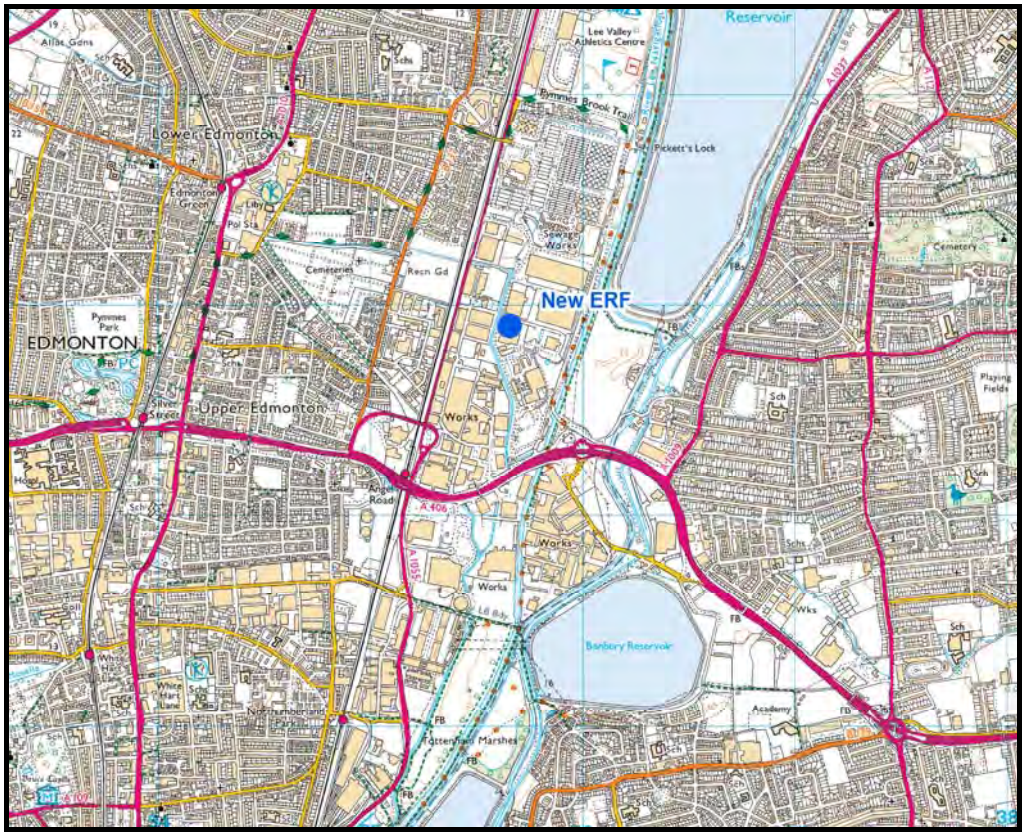
nlwa
north london waste authority

ARUP

EDMONTON ENERGY RECOVERY FACILITY (ERF):

HUMAN HEALTH RISK ASSESSMENT



August 2015

Report Reference: C25-P02-R02

Gair Consulting Ltd
Independent Air Quality & Odour Specialists

CONTENTS

1 INTRODUCTION

1.1 BACKGROUND

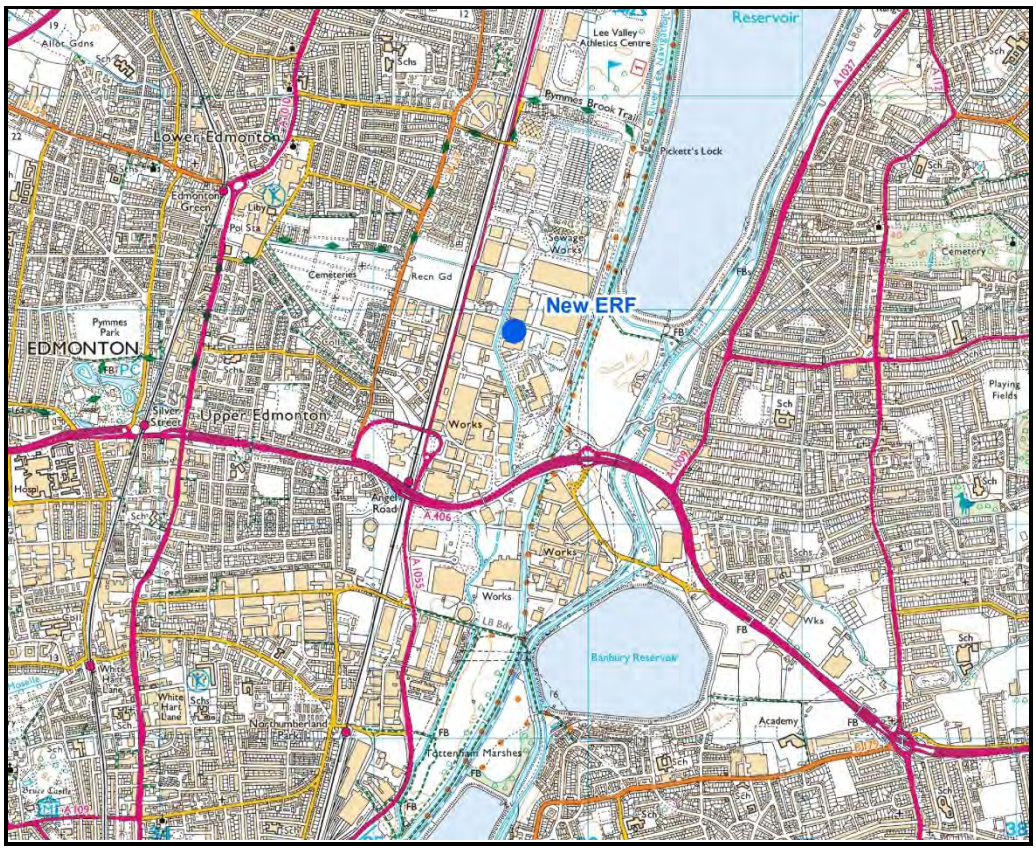
This assessment considers the effects of human exposure from emissions to air from a proposed energy recovery facility (ERF) at North London Waste Authority's (NLWA's) Edmonton EcoPark site. This is part of NLWA's North London Heat and Power Project. The ERF would eventually replace the existing energy from waste (EfW) facility at the Edmonton site. The proposed ERF would treat 700,000 tonnes of waste annually. A number of flue gas treatment technologies are being considered (semi-dry and wet) for the ERF and the air quality assessment for the proposed ERF has considered the relative impact of each of these. For the purposes of the HHRA, a worst-case scenario, wet flue gas treatment, has been used for assessing impacts on human health.

This assessment has been undertaken to support the application for a Development Consent Order (DCO) for the Project. In general, worst case assumptions are made with regard to the treatment of the emissions from the proposed ERF and the exposure of local people to the pollutants emitted. The baseline position for the assessment is the operation of the current facility. Therefore, the exposure to emissions from the ERF needs to be considered in addition to exposure to the EfW facility emissions via soils which may be contaminated with emissions from the existing EfW facility. In addition, the assessment has only considered the impact of the ERF on residents and farmers. Given the extensive area of reservoirs in close proximity to the Edmonton site, consideration may also need to be given to a fisher receptor if it is determined that the diet of residents may regularly be supplemented by edible fish obtained from fisheries within 3 km of the Application Site (refer to *Section 2.3*).

The Application Site for the Project is located in an industrial area to the north of the A406. It is located at the southern end of the William Girling Reservoir and north of Banbury Reservoir. The nearest residential settlements are at Upper Edmonton to the west and Chingford to the east. The location of the Edmonton site is presented in *Figure 1.1*.

The Project would utilise waste material as a fuel and as a consequence it would need to comply with the emission limits imposed by the Industrial Emissions Directive (IED) for the thermal treatment of waste. The assessment considers exposure to emissions to air, and subsequent deposition to soil, only as human exposure to any harmful pollutants discharged directly to the aquatic environment and from solid waste disposal is considered to be negligible and therefore excluded from the assessment.

FIGURE 1.1 LOCATION OF THE EDMONTON ENERGY RECOVERY FACILITY



1.2 PURPOSE OF THE ASSESSMENT

This report documents the findings of the impact of emissions on human health from direct and indirect exposure to emissions to air from the ERF. It has been prepared in accordance with our understanding of the requirements of the Environment Agency, as the regulator, for these types of development. In particular, this is a human health risk assessment of dioxin/furan emissions from the Project based on either the former Her Majesty's Inspectorate of Pollution (HMIP) or the United States (US) Environmental Protection Agency (EPA) Human Health Risk Assessment Protocol (HHRAP) methodology. Human exposure to dioxins and furans has been compared against the Committee of Toxicity (COT) Tolerable Daily Intake (TDI) of 2 pg/kg per day.

An assessment of exposure to dioxin-like polychlorinated biphenyls (PCBs) has also been included. It should be noted that the former HMIP method does not have the capability to consider dioxin-like PCBs and the US EPA HHRAP method is limited in this respect. The HHRAP method does not contain physical properties or exposure parameters for individual dioxin-like PCBs but does provide information for two dioxin-like PCB mixtures (Aroclor 1016 and Aroclor 1254). Therefore, for these two substances typical emissions for dioxin-like PCBs have been included in the Industrial Risk Assessment Program (IRAP) model and these have been assumed to comprise entirely of

Aroclor 1016 or Aroclor 1254 depending on which substance gives rise to the highest exposure.

Emissions of metals from the Project have also been included in the assessment.

For this HHRA, the assessment considers the impact of the ERF operating alone over a period of 30 years. The existing EfW facility has operated for approximately 44 years. Therefore, a cumulative assessment of emissions from both facilities has been carried out. It is proposed that there would be a transition stage between the existing EfW facility and the proposed ERF. This is where both would operate at reduced load for a period of approximately six months. However, as for the air quality assessment, it has been assumed that this transition period occurs for a period of one year. Therefore, three scenarios have been considered as follows:

- a transition stage with the existing EfW facility and proposed ERF operating for a short duration together (Stage 2)
- the proposed ERF operation alone (Stages 3/4); and
- cumulative impacts associated with the proposed ERF operating but whilst there may be historical contamination of soils from the operation of the existing EfW facility.

1.3 SCOPE OF THE ASSESSMENT

The emissions from the Project would contain a number of substances that cannot be evaluated in terms of their effects on human health simply by reference to ambient air quality standards. Health effects could occur through exposure routes other than purely inhalation. As such, an assessment needs to be made of the overall human *exposure* to the substances by the local population and then the *risk* that this exposure causes.

The assessment presented here considers the impact of certain substances released by the Project on the health of the local population at the point of maximum exposure. These substances are those that are 'persistent' in the environment and have several pathways from the point of release to the human receptor. Essentially, they can be described as dioxins/furans and metals. They are present in extremely small quantities and are typically measured in mass units of nanogrammes (ng = 10^{-9} g), picogrammes (pg = 10^{-12} g) and femtogrammes (fg = 10^{-15} g).

Unlike substances such as nitrogen dioxide, which have short term, acute effects on the respiratory system, dioxins/furans and metals have the potential to cause effects through long term, cumulative exposure. A lifetime is the conventional period over which such effects are evaluated. A lifetime is taken to be 70 years.

The exposure scenarios used here represent a highly unrealistic situation in which all exposure assumptions are chosen to represent a worst case and should be treated as an extreme view of the risks to health. While individual high-end exposure estimates may represent actual exposure possibilities (albeit at very low frequency), the possibility of all high end exposure assumptions accumulating in one individual is, for practical purposes, never realised. Therefore, intakes presented here should be regarded as an extreme upper estimate of the actual exposure that would be experienced by the real population in the locality.

1.4 APPROACH TO THE ASSESSMENT

The risk assessment process is based on the application of the US EPA HHRAP [1]. This protocol has been assembled into a commercially available model, Industrial Risk Assessment Program (IRAP, Version 3.3) and marketed by Lakes Environmental of Ontario.

The approach seeks to quantify the *hazard* faced by the receptor, the *exposure* of the receptor to the substances identified as being a potential hazard and then to assess the *risk* of the exposure, as follows:

- *Quantification of the exposure*: an exposure evaluation determines the dose and intake of key indicator chemicals for an exposed person. The dose is defined as the amount of a substance contacting body boundaries (in the case of inhalation, the lungs) and intake is the amount of the substance absorbed into the body. The evaluation is based upon worst-case, conservative scenarios, with respect to the following:
    - location of the exposed individual and duration of exposure;
    - exposure rate;
    - emission rate from the source.
- *Risk characterisation*: following the above steps, the risk is characterised by examining the toxicity of the chemicals to which the individual has been exposed, and evaluating the significance of the calculated dose in the context of probabilistic risk.

1 US EPA Office of Solid Waste (September 2005) Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities

2 METHODOLOGY FOR ESTIMATING EXPOSURE TO EMISSIONS

2.1 INTRODUCTION

An exposure assessment for the purposes of characterising the health impact of the Project's emissions requires the following steps:

(1) Measurement or estimation of emissions from the source.

(2) Modelling the fate and transport of the emitted substances through the atmosphere and through soil, water and biota following deposition onto land. Concentrations of the emitted chemicals in the environmental media are estimated at the point of exposure, which may be through inhalation or ingestion.

(3) Calculation of the uptake of the emitted chemicals into humans coming into contact with the affected media and the subsequent distribution in the body.

With regard to Step (3), the exposure assessment considers the uptake of polychlorinated dibenzo-para-dioxins and polychlorinated dibenzofurans (PCDD/Fs, often abbreviated to 'dioxins/furans'), dioxin-like PCBs and metals by various categories of human receptors. In addition, emissions of polycyclic aromatic hydrocarbons (PAHs) are considered, assuming as a worst-case that emissions comprise entirely of one of the more toxic PAHs, that of benzo(a)pyrene (B[a]P).

2.2 POTENTIAL EXPOSURE PATHWAYS

There are two primary exposure 'routes' where humans may come into contact with chemicals that may be of concern:

- direct, via inhalation; or
- indirect, via ingestion of water, soil, vegetation and animals and animal products that become contaminated through the food chain.

There are four other potential exposure pathways of concern following the introduction of substances into the atmosphere:

- ingestion of drinking water;
- dermal (skin) contact with soil;
- incidental ingestion of soil; and
- dermal (skin) contact with water.

2.3 EXPOSURE PATHWAYS CONSIDERED IN THE ASSESSMENT

The possible exposure pathways included in the IRAP model are shown in *Figure 2.1*. Dermal contact with soil is an insignificant exposure pathway on the basis of the infrequent and sporadic nature of the events and the very low dermal absorption factors for this exposure route, coupled with the low plausible total dose that may be experienced (when considered over the lifetime of an individual). Health risk assessments of similar emissions (Pasternach (1989) *The Risk Assessment of Environmental and Human Health Hazards*, John Wiley, New York) have concluded that dermal absorption of soil is at least one order of magnitude less efficient than lung absorption.

Similar arguments are relevant with respect to the elimination of aquatic pathways from consideration; swimming, fishing and other recreational activities are also sporadic and unlikely to lead to significant exposures or uptake of any contamination into the human body via dermal contact with water.

Exposure via drinking water requires contamination of drinking water sources local to the point of consumption. The likelihood of contamination reaching a level of concern in the local water sources and ground water supplies is extremely low, particularly where there is no large scale storage (e.g. reservoirs) or catchment areas for local water supplies. However, the US EPA's HHRAP does include the ingestion of drinking water from surface water sources as a potential exposure pathway where water bodies and water sheds have been defined within the exposure scenario. The ingestion of groundwater as a source of local drinking water is not considered by the HHRAP as it is considered to be an insignificant exposure pathway for combustion emissions.

On the basis of the assessment of the potential significance of the exposure pathways the key exposure pathways which are relevant to the assessment and, hence, subject to examination in detail are as follows:

- inhalation;
- ingestion of food; and
- ingestion of soil.

The ingestion of drinking water from surface water sources is only considered a potential exposure pathway where there is a local surface water body which provides local drinking water. There are a number of large reservoirs to the south and east of the Application Site which are part of the Walthamstow Reservoir system which supplies drinking water to London and are owned and managed by Thames Water. However, it is our experience that drinking water from a reservoir located close to this type of facility makes a very small contribution to the total exposure. Therefore, exposure via drinking water is generally only considered where there is the potential for exposure via the

ingestion of fish and the presence of edible fish farms (e.g. trout or salmon farms). Therefore, for the purposes of this EIA, exposure via drinking water has been excluded.

The exposures arising from ingestion have been assessed with reference to the following:

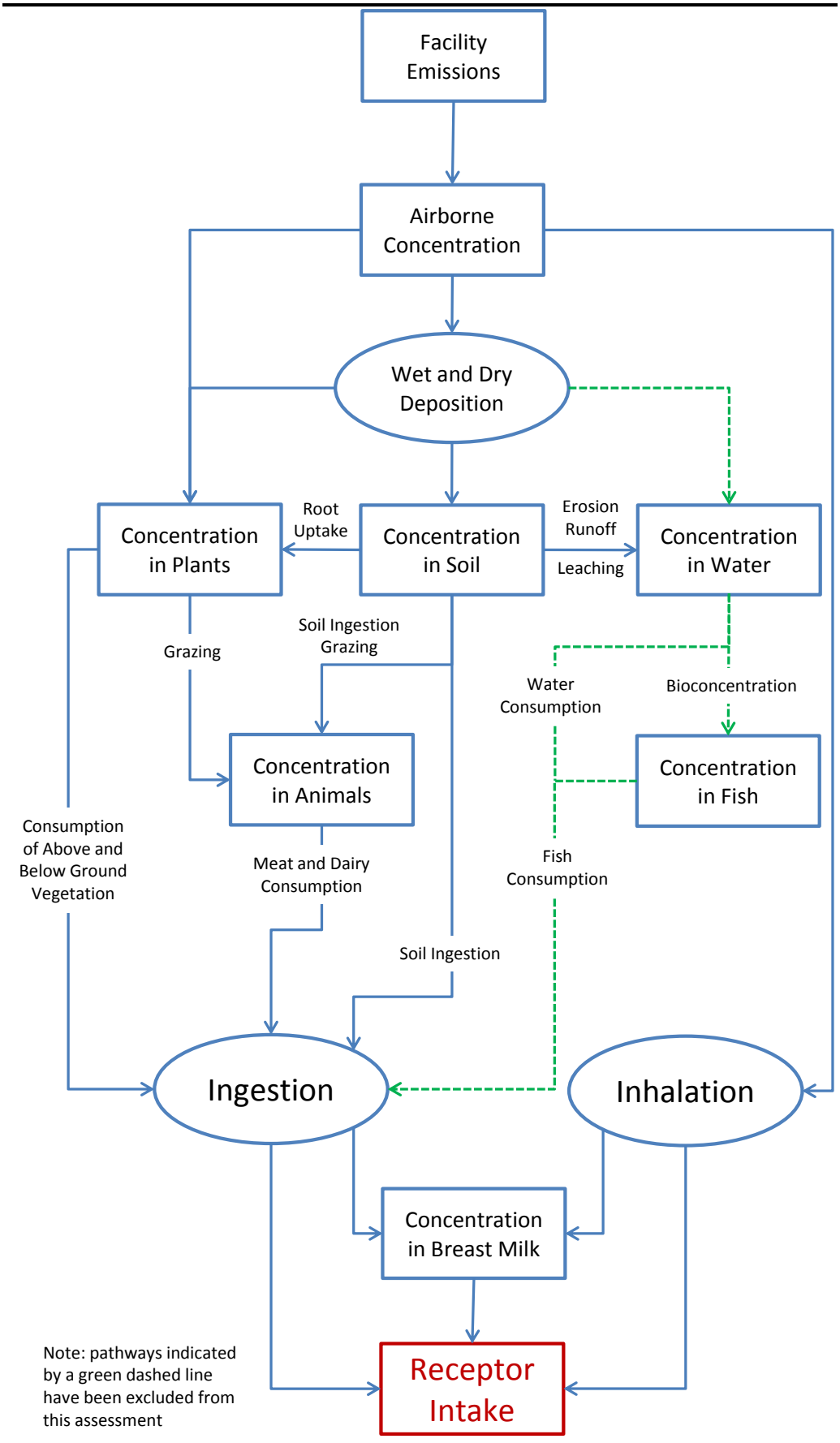
- milk from home-reared cows;
- eggs from home-reared chickens;
- home-reared beef;
- home-reared pork;
- home-reared chicken;
- home-grown vegetable and fruit produce;
- breast milk; and
- soil (incidental).

The inclusion of all food groups in the assessment conservatively assumes that both arable and pasture land are present within areas used for farming and that residents located at the predicted maximum annual average ground level concentration grow and consume their own vegetables. This is, in reality, a highly unlikely scenario. It has been adopted, however, as a means of building a high degree of conservatism into the assessment. It should be noted that not all exposure scenarios would result in the ingestion of home-reared meat and animal products and these food products are only considered by the HHRAP for farmers and the families of farmers. Similarly, the ingestion of fish is only considered where there is a local water body that is used for fishing and where the diet of the fisher (and family) may be regularly supplemented by fish caught from these local water sources.

There are ten individual reservoirs that make up the Walthamstow Reservoir system; some of these are Sites of Special Scientific Interest (SSSI). These reservoirs are used for fly-fishing and for coarse fishing. Only three of the reservoirs are used for fly-fishing: Reservoir 4 (3.5 km to the south); Reservoir 5 (4 km to the south) and Warwick Reservoir East (catch and release only). The reservoirs are stocked throughout the season with a total of 11,000 rainbow and brown trout. The rainbow trout are stocked at a minimum weight of 1 kg. Season tickets are available for the two reservoirs where fish can be taken with a season limit of 75 fish.

Seven of the reservoirs are used for coarse fishing but coarse fish are not generally consumed in the UK although it is noted that some types of coarse fish may be eaten by Eastern Europeans. In addition, it is against Thames Water's regulations for fishing at Walthamstow Reservoirs for coarse fish to be taken. Therefore, coarse fish from reservoirs in close proximity to the Application Site would not be consumed locally.

FIGURE 2.1 EXPOSURE PATHWAYS FOR RECEPTORS



Given the proximity of the fly-fishing reservoirs to the Application Site and the limit on edible fish that can be taken it is considered that the diet of local residents is unlikely to be regularly supplemented with fish contaminated with emissions from the Project. Therefore, a fisher receptor has been excluded from the assessment.

2.4 EMISSIONS AND DISPERSION MODELLING INPUT DATA

2.4.1 Compounds of Potential Concern (COPCs)

The substances which have been considered in the assessment are referred to as the Compounds of Potential Concern (COPCs). The substances that have been included for this assessment are those that are authorised emissions and which are included in the EPA HHRAP COPC database for the assessment of long term health effects. Although emission limits for PAHs are not currently set, monitoring of PAHs is required by the regulations. Therefore, benzo(a)pyrene has been included in the assessment to represent PAH emissions. Therefore, the following have been considered as COPCs for the Project:

- PCDD/Fs (individual congeners) and dioxin-like PCBs;
- benzo(a)pyrene;
- antimony (Sb);
- arsenic (As);
- cadmium (Cd);
- chromium (Cr), trivalent and hexavalent;
- mercury (Hg);
- lead (Pb); and
- nickel (Ni).

The 2005 protocol excludes thallium (Tl) by virtue of there being no reference dose, reference concentration or cancer slope factors for thallium. This is at variance with the draft 1998 protocol which did include thallium in the assessment of hazards. The toxic properties of thallium are well known and it is our opinion that thallium should be included in the assessment of hazards. Therefore, the 1998 US EPA reference data have been used to assess the hazards associated with exposure to thallium.

2.4.2 Emission Concentrations for the COPCs

Emission Parameters

The proposed ERF comprises two individual flues which would be combined within a single stack or located sufficiently close that they can be considered as a single emission source. For the EIA, this assessment considers two scenarios: the existing EfW facility; and the proposed ERF with a waste

throughput of 700,000 tonnes per annum (tpa). In addition, a transition stage is considered where the two would operate together for a short period of six months, assumed to be one year as a worst-case.

For the proposed ERF, emission parameters are consistent with those used for the air quality assessment (for wet flue gas treatment), as follows:

- stack height of 100m above ground level;
- an effective (for the two flues combined) internal stack diameter of 3.78m;
- a nominal emission velocity of 15 m s^{-1}; and
- an exhaust temperature of 60°C.

With respect to the emission velocity and the temperature, these are considered to represent worst-case conditions. The emission velocity is the minimum velocity that would be considered and any increase in velocity will increase the vertical momentum of the plume and aid dispersion of the emissions. Similarly, the exhaust gases may be heated in order to reduce the occurrence of visible plumes. This would increase the thermal buoyancy of the plume and also aid dispersion of the emissions.

Metals Emissions

For the metals considered for the health risk assessment, the individual emission concentrations are presented in *Table 2.1*. For the Group 1 metals (cadmium and thallium) and Group 2 metals (mercury) these have been derived from information provided in the Defra report on Emissions from Waste Management Facilities [2]. For Group 3 metals, emissions have been derived from information provided by the Environment Agency [3]. Some of the Group 3 metals are excluded from this assessment, on the grounds that they pose little or no hazard in the context of long term health impacts, and as such are not included in the EPA HHRAP COPC database; these are cobalt, copper, manganese and vanadium. This approach to the release rates for metals is different to that used for the air quality assessment, which has assumed that release rates are constantly at the limit values.

2 WR 0608 Emissions from Waste Management Facilities, Report for Defra, ERM (July 2011)

3 Releases from Municipal Waste Incinerators, Guidance to Applicants on Impact Assessment for Group 3 Metals, Environment Agency (September 2012)

TABLE 2.1 METAL EMISSION RATES USED IN THE IRAP MODEL

Pollutant	Percentage of Relevant Group	Emission Concentration (mg Nm^{-3})	Emission Rate for the Proposed ERF (g s^{-1})
Antimony	0.70 per cent	0.0035	0.00047
Arsenic	0.14 per cent	0.00070	0.000095
Cadmium	2.70 per cent	0.0014	0.00018
Chromium III	2.2 per cent	0.011	0.0015
Chromium VI	0.007 per cent	0.000035	0.0000047
Lead	3.2 per cent	0.016	0.0022
Mercury	6.4 per cent	0.0032	0.00043
Nickel	4.4 per cent	0.022	0.0030
Thallium	2.7 per cent	0.0014	0.00018

In accordance with the methodology it is important that loss of mercury to the global cycle is accounted for. For this purpose, the IRAP default values have been used and it is assumed that of the total mercury emitted 51.8 per cent is lost to the global cycle, 48.0 per cent is deposited as divalent mercury and 0.2 per cent is emitted as elemental mercury. The model assumes that human exposure to elemental mercury occurs only through direct inhalation of the vapour phase elemental form. Human exposure to divalent mercury occurs through both indirect and direct inhalation pathways in the form of vapour and particle-bound mercuric chloride.

Therefore, the following emission rates for mercury have been assumed:

- elemental mercury at 8.7×10^{-7} g s^{-1} for the proposed ERF; and
- mercuric chloride at 2.1×10^{-4} g s^{-1} for the proposed ERF.

For the existing EfW facility, the group 3 metals are assumed to be the same proportion as provided in *Table 2.1* of the emission limit of 0.5 mg Nm^{-3}. Measured emissions data were available but only as a total group emission of 0.09 mg Nm^{-3}. For mercury, the measured emission concentration was assumed (0.001 mg Nm^{-3}) and for cadmium and thallium these were assumed to be 50 per cent each of the measured emission concentration of 0.0019 mg Nm^{-3}.

Polychlorinated dibenzo-p- dioxins, polychlorinated dibenzo furans (PCDD/Fs) and Other Organic Emissions

The general term dioxins denotes a family of compounds, with each compound composed of two benzene rings interconnected with two oxygen atoms. There are 75 individual dioxins, with each distinguished by the position of chlorine or other halogen atoms positioned on the benzene rings. Furans are similar in structure to dioxins, but have a carbon bond instead of one of the two oxygen atoms connecting the two benzene rings. There are 135

individual furan compounds. Each individual furan or dioxin compound is referred to as a congener and each has a different toxicity and physical properties with regard to its atmospheric behaviour. It is important, therefore, that the exposure methodology determines the fate and transport of PCDD/Fs on a congener specific basis. It does this by accounting for the varying volatility of the congeners and their different toxicities. Consequently, information regarding the PCDD/F annual mean ground level concentrations on a congener specific basis is required. For the purposes of the exposure assessment, the congener profile for the Project is presented in *Table 2.2*, which is a standard profile for municipal waste incinerators derived by the former HMIP, one of the predecessors of the Environment Agency. The international toxic equivalency factors are given and used to derive the toxic equivalent emission (I-TEQ). As a worst-case, it is assumed that PCDD/F emissions are at the maximum emission limit of 0.1 ng I-TEQ Nm^{-3}. For the purposes of assessing the impact of the existing EfW facility and the proposed ERF, this congener profile has been adopted. Both the existing EfW facility and the proposed ERF are assumed to emit at the limit of 0.1 ng Nm^{-3}.

TABLE 2.2 PCDD/F CONGENER PROFILE FOR THE EXISTING EFW FACILITY AND PROPOSED ERF

Congener	Annual Mean Emission Concentration (ng Nm^{-3}) (a)	I-TEF toxic equivalent factors)	Annual Mean Emission Concentration (ng I-TEQ Nm^{-3}) (a)
2,3,7,8-TCDD	0.0031	1.0	0.0031
1,2,3,7,8-PeCDD	0.025	0.5	0.012
1,2,3,4,7,8-HxCDD	0.029	0.1	0.0029
1,2,3,7,8,9-HxCDD	0.021	0.1	0.0021
1,2,3,6,7,8-HxCDD	0.026	0.1	0.0026
1,2,3,4,6,7,8-HpCDD	0.17	0.01	0.0017
OCDD	0.40	0.001	0.00040
2,3,7,8-TCDF	0.027	0.1	0.0028
2,3,4,7,8-PeCDF	0.054	0.5	0.027
1,2,3,7,8-PeCDF	0.028	0.05	0.0014
1,2,3,4,7,8-HxCDF	0.22	0.1	0.022
1,2,3,7,8,9-HxCDF	0.0042	0.1	0.00040
1,2,3,6,7,8-HxCDF	0.081	0.1	0.0081
2,3,4,6,7,8-HxCDF	0.087	0.1	0.0087
1,2,3,4,6,7,8-HpCDF	0.44	0.01	0.0044
1,2,3,4,7,8,9-HpCDF	0.043	0.01	0.00040
OCDF	0.36	0.001	0.00040
Total (ng Nm^{-3})	**2.1**		**0.1**

(a) Congener profile from Table 7.2a DOE (1996) Risk Assessment of Dioxin Releases from Municipal Waste Incineration Processes Contract No. HMIP/CPR2/41/1/181

The total emission of dioxin-like PCBs has been obtained from the Defra report WR 0608 2. Based on the information provided, a maximum emission concentration of 3.6×10^{-9} mg m^{-3} is assumed. It is not stated whether this is total PCBs or dioxin-like PCBs. Therefore, as a worst-case it is assumed to comprise entirely of dioxin-like PCBs. Furthermore, it is assumed that this is the total PCB emission and that these data are presented as the toxic equivalent concentration (i.e. 3.6×10^{-9} mg TEQ Nm^{-3}). For the dioxin-like PCBs, a toxic equivalent factor (TEF) of 0.1 has been used to provide an actual emission concentration (i.e. 3.6×10^{-8} mg Nm^{-3}). The same equivalence factor has been used to convert the total actual dose back to the total toxic equivalent dose.

For benzo(a)pyrene, information available on emissions data is limited. Therefore, as a worst-case, it is assumed that emissions are as provided in the Defra WR 0608 2 report for energy from waste facilities (median concentration equivalent to 9×10^{-5} mg Nm^{-3}).

For the proposed ERF, the emission rates for each substance as input to the IRAP model are provided in *Table 2.3*.

TABLE 2.3 PCDD/F AND OTHER ORGANIC EMISSION RATES USED IN THE IRAP MODEL FOR THE PROPOSED ERF

Congener	Emission Concentration (mg Nm^{-3})	Emission Rate (g s^{-1})
2,3,7,8-TCDD	0.0031×10^{-6}	4.2×10^{-10}
1,2,3,7,8-PeCDD	0.025×10^{-6}	3.3×10^{-9}
1,2,3,4,7,8-HxCDD	0.029×10^{-6}	3.9×10^{-9}
1,2,3,7,8,9-HxCDD	0.021×10^{-6}	2.8×10^{-9}
1,2,3,6,7,8-HxCDD	0.026×10^{-6}	3.5×10^{-9}
1,2,3,4,6,7,8-HpCDD	0.17×10^{-6}	2.3×10^{-8}
OCDD	0.40×10^{-6}	5.4×10^{-8}
2,3,7,8-TCDF	0.028×10^{-6}	3.8×10^{-9}
2,3,4,7,8-PeCDF	0.054×10^{-6}	7.3×10^{-9}
1,2,3,7,8-PeCDF	0.028×10^{-6}	3.8×10^{-9}
1,2,3,4,7,8-HxCDF	0.22×10^{-6}	3.0×10^{-8}
1,2,3,7,8,9-HxCDF	0.0040×10^{-6}	5.4×10^{-10}
1,2,3,6,7,8-HxCDF	0.081×10^{-6}	1.1×10^{-8}
2,3,4,6,7,8-HxCDF	0.087×10^{-6}	1.2×10^{-8}
1,2,3,4,6,7,8-HpCDF	0.44×10^{-6}	6.0×10^{-8}
1,2,3,4,7,8,9-HpCDF	0.040×10^{-6}	5.4×10^{-9}
OCDF	0.40×10^{-6}	5.4×10^{-8}
Aroclor 1016/1254	0.036×10^{-6}	4.9×10^{-9}
Benzo(a)pyrene	3.0×10^{-4}	1.2×10^{-5}
Antimony	0.0035	0.00047

TABLE 2.3 PCDD/F AND OTHER ORGANIC EMISSION RATES USED IN THE IRAP MODEL FOR THE PROPOSED ERF

Congener	Emission Concentration (mg Nm^{-3})	Emission Rate (g s^{-1})
Arsenic	0.00070	0.000095
Cadmium	0.0014	0.00018
Chromium	0.011	0.0015
Chromium, hexavalent	0.000035	0.0000047
Lead	0.016	0.0022
Mercury	0.0032	0.00043
Nickel	0.022	0.0030
Thallium	0.0014	0.00018
Elemental mercury	0.0000064	0.00000087
Mercuric chloride	0.0015	0.00021

2.5 DISPERSION MODELLING ASSUMPTIONS

The air quality assessment has relied upon the use of the UK Atmospheric Dispersion Modelling System (ADMS) to estimate ground level concentrations of pollutants. The IRAP model, however, has been designed to accept only output files from the US EPA ISC or AERMOD dispersion models, reflecting its North American origins and its need to follow the US EPA risk assessment protocol. To maintain consistency with the air quality assessment, it has been possible to use output from the ADMS model with IRAP using the following procedure:

- generation of ISC input files and output files for the study area;
- generation of ADMS output data using the approach outlined in the US EPA risk assessment protocol; and
- inserting the ADMS results into the ISC output files.

For the modelling, all emission properties, building heights, and other relevant factors were retained from the air quality assessment. As the health risk assessment requires information on the deposition of substances to surfaces as well as airborne concentrations of substances, the ADMS dispersion model has also been used to predict the following:

- the airborne concentration of vapour, particle and particle bound substances emitted;
- the wet deposition rate of vapour, particle and particle bound substances; and
- the dry deposition rate of vapour, particle and particle bound substances.

For dry deposition of particles and particle bound contaminants a fixed deposition velocity of 0.01 m s^{-1} has been used. The ERF would be equipped with fabric filters and the emitted particles are likely to be predominantly in the size range 1 -2 μm in diameter. For particles of this size, deposition velocities are likely to be of the order of 0.001 to 0.01 m s^{-1}. Therefore, as a worst-case, for the ADMS modelling a value of 0.01 m s^{-1} has been adopted.

2.6 DISPERSION MODELLING RESULTS

A summary of the key results from the ADMS dispersion modelling is presented in *Table 2.4* for the proposed ERF. These have been predicted using the 2014 London City Airport meteorological data set. This year was selected as it was the year that provided highest predicted annual mean concentrations based on the air quality assessment carried out for the Project.

TABLE 2.4 MAXIMUM ANNUAL AVERAGE PARTICLE PHASE CONCENTRATIONS AND PARTICLE PHASE DEPOSITION RATES ESTIMATED FOR THE PROPOSED ERF

Pollutant	Max Annual Average Concentration (a)	Max Annual Average Deposition Rate (b)
Metals	**(ng m^{-3})**	**(mg m^{-2} $year^{-1}$)**
Antimony	0.032	0.30
Arsenic	0.0065	0.060
Cadmium	0.013	0.116
Chromium III	0.10	0.94
Chromium VI	0.00032	0.0030
Lead	0.15	1.37
Nickel	0.20	1.89
Thallium	0.013	0.116
Elemental mercury	0.000059	0.00055
Mercuric chloride	0.014	0.132
Benzo(a)pyrene	0.00084	0.0077
PCDD/Fs	**(fg m^{-3})**	**(fg m^{-3})**
2,3,7,8-TCDD	0.029	0.27
1,2,3,7,8-PeCDD	0.23	2.1
1,2,3,4,7,8-HxCDD	0.27	2.5
1,2,3,7,8,9-HxCDD	0.19	1.8
1,2,3,6,7,8-HxCDD	0.24	2.2
1,2,3,4,6,7,8-HpCDD	1.6	14.6
OCDD	3.7	34.3
2,3,7,8-TCDF	0.26	2.4
2,3,4,7,8-PeCDF	0.50	4.6
1,2,3,7,8-PeCDF	0.26	2.4
1,2,3,4,7,8-HxCDF	2.0	18.7
1,2,3,7,8,9-HxCDF	0.037	0.34

TABLE 2.4 MAXIMUM ANNUAL AVERAGE PARTICLE PHASE CONCENTRATIONS AND PARTICLE PHASE DEPOSITION RATES ESTIMATED FOR THE PROPOSED ERF

Pollutant	Max Annual Average Concentration (a)	Max Annual Average Deposition Rate (b)
1,2,3,6,7,8-HxCDF	0.75	7.0
2,3,4,6,7,8-HxCDF	0.81	7.5
1,2,3,4,6,7,8-HpCDF	4.1	37.8
1,2,3,4,7,8,9-HpCDF	0.37	3.4
OCDF	3.7	34.3
Aroclor 1016/1254	0.33	3.1

(a) Where 1 ng m^{-3} is equal to 1 x 10^{-9} g m^{-3} and 1 fg m^{-3} is equal to 1 x 10^{-15} g m^{-3}

(b) Where 1 mg m^{-2} $year^{-1}$ is equal to 1 x 10^{-3} g m^{-2} $year^{-1}$ and 1 ng m^{-2} $year^{-1}$ is equal to 1 x 10^{-9} g m^{-2} $year^{-1}$

3 INPUT PARAMETERS FOR THE IRAP MODEL

3.1 INTRODUCTION

Exposure of an individual to a chemical may occur either by inhalation or ingestion (including food, water and soil). Of interest is the total dose of the chemical received by the individual through the combination of possible routes, and the IRAP model has been developed to estimate the dose received by the human body, often referred to as the external dose.

Exposure to COPCs is a function of the estimated concentration of the substance in the environmental media with which individuals may come into contact (i.e. exposure point concentrations) and the duration of contact. The concentration at the point of contact is itself a function of the transfer through air, soil, water, plants and animals that form part of the overall pathway. Exposure equations have been developed which combine exposure factors (e.g. exposure duration, frequency and medium intake rate) and exposure point concentrations. The dose equations therefore facilitate estimation of the received dose and account for the properties of the route of exposure, i.e. ingestion and inhalation.

For those substances that bio-accumulate, i.e. become more concentrated higher up the food chain, especially in body fats, the exposure through ingestion of meats and milk is of particular significance.

The IRAP model user has the Project to adjust some of the key exposure factors. An example is the diet of the receptor and the proportion of which is local produce, which may be contaminated. Obviously, if a nearby resident eats no food grown locally, then that person's diet cannot be contaminated by the emissions from the source, in this case the proposed ERF. It is conventional to investigate two types of receptor, a farmer and a resident. It is assumed that a farmer eats proportionately more locally grown food than a resident. Where the potential exists for the consumption of locally caught fish a fisher receptor may also be considered. For this assessment, the consumption of locally caught fish has been screened out as it is not considered to be a significant exposure pathway (refer *Section 2.3*).

The receptor types can also be divided into adults and children. Children are important receptors because they tend to ingest soil and dusts directly and have lower body weights, so that the effect of the same dose is greater in the child than in the adult.

The IRAP model is designed to accept output files of airborne concentrations and deposition rates. From these, it proceeds to calculate the concentrations of the pollutants of concern in the environmental media, foodstuffs and the human receptor.

The model requires a wide range of input parameters to be defined, these include:

- physical and chemical properties of the COPCs;
- site information, including site specific data; and
- receptor information – for each receptor type (e.g. adult or child, resident or farmer or fisher).

The HHRAP default values, which are incorporated into the IRAP model, have been used for the majority of these input values. These data are provided in the following sections.

3.2 INPUT PARAMETERS FOR THE COPCS

The IRAP model contains a database of physical and chemical parameters for each of 206 COPCs. This database is based on default values provided by the HHRAP and all default values have been used for this assessment.

These parameters are used to determine how each of the COPCs behave in the environment and their presence and accumulation in various food products (meat, fish, animal products, vegetation, soil and water). For cadmium and 2,3,7,8-TCDD (the most toxic of the PCDD/Fs), the default parameters are provided in *Table 3.1.*

TABLE 3.1 IRAP INPUT PARAMETERS FOR CADMIUM AND 2, 3, 7, 8-TCDD

Parameter Description	Symbol	Units	Cadmium	2,3,7,8-TCDD
Chemical abstract service number	CAS No.	-	7440-43-9	1746-01-6
Molecular weight	MW	g mole^{-1}	112.4	322.0
Melting point of chemical	T_m	K	593.2	578.7
Vapour pressure	V_p	atm	5.5 x 10^{-12}	1.97 x 10^{-12}
Aqueous solubility	S	mg L^{-1}	123000	1.93 x 10^{-5}
Henry's Law constant	H	atm-m^3 mol^{-1}	0.031	3.29 x 10^{-5}
Diffusivity of COPC in air	D_a	cm^2 s^{-1}	0.0772	0.104
Diffusivity of COPC in water	Dw	cm^2 s^{-1}	9.6 x 10^{-6}	5.6 x 10^{-6}
Octanol-water partition coefficient	K_ow	-	0.85	6,309,573
Organic carbon-water partition coefficient	K_oc	mL g^{-1}	0	3,890,451
Soil-water partition coefficient	Kd_s	mL g^{-1}	75	38,904
Suspended sediments/surface water partition coefficient	Kd_sw	L kg^{-1}	75	291,784

TABLE 3.1 IRAP INPUT PARAMETERS FOR CADMIUM AND 2, 3, 7, 8-TCDD

Parameter Description	Symbol	Units	Cadmium	2,3,7,8-TCDD
Bed sediment/sediment pore water partition coefficient	Kd_bs	mL g^{-1}	75	155,618
COPC loss constant due to biotic and abiotic degradation	K_sg	a^{-1}	0	0.03
Fraction of COPC air concentration in vapour phase	f_v		0.009	0.664
Root concentration factor	RCF	mL g^{-1}	0	39,999
Plant-soil bioconcentration factor for below ground produce	br_root_veg	-	0.064	1.03
Plant-soil bioconcentration factor for leafy vegetables	br_leafy_veg	-	0.125	0.00455
Plant-soil bioconcentration factor for forage	br_forage	-	0.364	0.00455
COPC air-to-plant biotransfer factor for leafy vegetables	bv_leafy_veg	-	0	65,500
COPC air-to-plant biotransfer factor for forage	bv_forage	-	0	65,500
COPC biotransfer factor for milk	ba_milk	day kg^{-1}	6.5×10^{-6}	0.0055
COPC biotransfer factor for beef	ba_beef	day kg^{-1}	1.2×10^{-4}	0.026
COPC biotransfer factor for pork	ba_pork	day kg^{-1}	1.9×10^{-4}	0.032
Bioconcentration factor for COPC in eggs	Bcf_egg	-	0.0025	0.060
Bioconcentration factor for COPC in chicken	Bcf_chicken	-	0	3.32
Fish bioconcentration factor	BCF_fish	L kg^{-1}	907	34,400
Fish bioaccumulation factor	BAF_fish	L kg^{-1}	0	0
Biota-sediment accumulation factor	BSAF_fish	-	0	0.09
Plant-soil bioconcentration factor for grain	br_grain	-	0.062	0.00455
Plant-soil bioconcentration factor for eggs	br_egg	-	0.0025	0.011
COPC biotransfer factor for chicken	ba_chicken	day kg^{-1}	0.11	0.019

Toxicity factors (e.g. reference doses, unit risk factors) are provided in *Table 3.2* for all of the COPCs. These are used to determine the carcinogenic risk or hazard associated with exposure to each COPC via inhalation or ingestion exposure pathways.

TABLE 3.2 TOXICITY FACTORS FOR THE COPCS CONSIDERED FOR THE ASSESSMENT

COPC	Ingestion Reference Dose	Inhalation Reference Concentration	Ingestion Carcinogenic Slope Factor (b)	Inhalation Unit Risk Factor (b)
Symbol	**RfD**	**RfC**	**Ing_csf**	**Inh_URF**
Units	**(mg kg^{-1} d^{-1})**	**(mg m^{-3})**	**(mg kg^{-1} $d^{-1})^{-1}$**	**(µg $m^{-3})^{-1}$**
Metals				
Antimony	0.0004	0.0014	0	0
Arsenic	0.0003	3.0×10^{-5}	1.5	0.0043
Cadmium	0.0004	0.0002	0.38	0.0018
Chromium III	1.5	5.3	0	0
Chromium VI	0.0030	8.0×10^{-6}	0	0.012
Lead	0.000429	0.0015	0.0085	1.2×10^{-5}
Nickel	0.02	0.0002	0	0.00024
Thallium (a)	0.00008	0.00028	0	0
Elemental mercury	8.57×10^{-5}	0.0003	0	0
Mercuric chloride	0.0003	0.0011	0	0
Methyl mercury	0.0001	0.00035	0	0
Benzo(a)pyrene	0	0	7.3	0.0011
PCDD/Fs				
2,3,7,8-TCDD	1×10^{-9}	0	150000	38
1,2,3,7,8-PeCDD	0	0	150000	38
1,2,3,4,7,8-HxCDD	0	0	15000	3.8
1,2,3,7,8,9-HxCDD	0	0	6200	3.8
1,2,3,6,7,8-HxCDD	0	0	6200	3.8
1,2,3,4,6,7,8-HpCDD	0	0	1500	0.38
OCDD	0	0	15	0.011
2,3,7,8-TCDF	0	0	15000	3.8
2,3,4,7,8-PeCDF	0	0	75000	11.4
1,2,3,7,8-PeCDF	0	0	7500	1.14
1,2,3,4,7,8-HxCDF	0	0	15000	3.8
1,2,3,7,8,9-HxCDF	0	0	15000	3.8
1,2,3,6,7,8-HxCDF	0	0	15000	3.8
2,3,4,6,7,8-HxCDF	0	0	15000	3.8
1,2,3,4,6,7,8-HpCDF	0	0	1500	0.38
1,2,3,4,7,8,9-HpCDF	0	0	1500	0.38
OCDF	0	0	15	0.011
Aroclor 1016	7×10^{-5}	2.5×10^{-4}	0	0
Aroclor 1254	2×10^{-5}	7×10^{-5}	0	0

(a) Reference data for thallium have been taken from the 1998 US EPA HHRA protocol
(b) For PCDD/Fs, values derived as advised by Lakes Environmental

The Reference Dose (ingestion) and Reference Concentration (inhalation) for each COPC is used to determine the non-carcinogenic risk associated with exposure. The Carcinogenic Slope Factors (ingestion) are used to determine

the carcinogenic risk from ingestion. The Unit Risk Factors are used to determine the carcinogenic risk from inhalation. The methodology used for calculating total non-carcinogenic and carcinogenic risk is provided in *Section 4.2*.

3.3 SITE AND SITE SPECIFIC PARAMETERS

The IRAP health risk assessment model requires information relating to the industrial location and its surroundings. The parameters required include the following.

- The fraction of animal feed (grain, silage and forage) grown on contaminated soils and quantity of animal feed and soil consumed by the various animal species considered.
- The interception fraction for above ground vegetation, forage and silage and length of vegetation exposure to deposition. The yield/standing crop biomass is also required.
- Input data for assessing the risks associated with exposure to breast milk, including:
    - body weight of infant;
    - exposure duration;
    - proportion of ingested COPC stored in fat;
    - proportion of mother's weight that is fat;
    - fraction of fat in breast milk;
    - fraction of ingested contaminant that is absorbed; and
    - half-life of dioxins in adults and ingestion rate of breast milk.
- Other physical parameters (e.g. soil dry bulk density, density of air, soil mixing zone depth).

For all of these parameters the IRAP/EPA HHRAP default values have been used and these are presented in *Annex A*. Other site specific parameters are also required which are not provided by the IRAP model. These parameters were specified for the Project location as follows:

- Annual average evapotranspiration rate of 70 cm a^{-1} (assumed to be 70 per cent of total precipitation);
- Annual average precipitation of 100 cm a^{-1} (based on local meteorological data for London City Airport for 2014);
- Annual average irrigation of 0 cm a^{-1};
- Annual average runoff of 10 cm a^{-1} (assumed to be 10 per cent of total precipitation);

- An annual average wind velocity of 4.2 $m\ s^{-1}$ (based on London City Airport meteorological data for 2014); and
- A time period over which deposition occurs of 30 years.

3.4 RECEPTOR INFORMATION

Within the IRAP model there are three possible receptor types; Resident, Farmer and Fisher but not all may be considered appropriate. For this assessment, only Farmer and Resident receptors are considered. Information relating to each receptor type (adult and/or child) is required by the model where these receptor types are used. The information required includes the following:

- Food (meat, dairy products, fish and vegetables), water and soil consumption rates for each receptor type. However, only Fishers are assumed to consume fish and only Farmers are assumed to consume locally reared animals and animal products.
- Fraction of contaminated food, water and soil which is consumed by each receptor type.
- Input data for the inhalation exposure including: inhalation exposure duration, inhalation exposure frequency, inhalation exposure time; and inhalation rate.
- Input data for the ingestion exposure including: exposure duration, exposure frequency, exposure time; and body weight of receptor.

For the purposes of this assessment the default IRAP/HHRAP parameters have been used to define the characteristics of the receptors. The input data used are presented in *Annex B*.

4 EXPOSURE ASSESSMENT

4.1 SELECTION OF RECEPTORS

In addition to defining specific locations for assessment, IRAP can be used to determine the location of maximum impact over an area based on the results of the dispersion model. For each defined land-use area, IRAP selects the locations which represent the maximum predicted concentrations or deposition rates for the area selected. The locations of these various maxima are often co-located resulting in the selection of one to nine receptor locations per defined area. This approach is adopted by IRAP since the maximum receptor impact may occur at any one of the maximum concentration or deposition locations identified.

For the proposed ERF, residential exposure within the immediate vicinity is limited by the industrial nature of the Application Site. The nearest residential areas are to the east at Chingford, Higham Hill to the southeast and Upper Edmonton to the west. In addition, there are residential areas located within Chingford Green, Lower Edmonton, Ponders End and Tottenham. Therefore, seven areas where residential exposure may occur have been defined based on these locations. There are a large number of allotments within the urban area and these are not necessarily located within residential areas. Therefore, an allotment receptor has been identified based on the maximum exposure for these allotments assuming that the resident lives on or close to the allotment and consumes all of his or her vegetables from the allotment.

The urban nature of the land use around the Edmonton site means that areas used for farming are very limited and the only area identified is located to the northwest beyond Chingford Green. Therefore, farmer receptors have been selected based on this area.

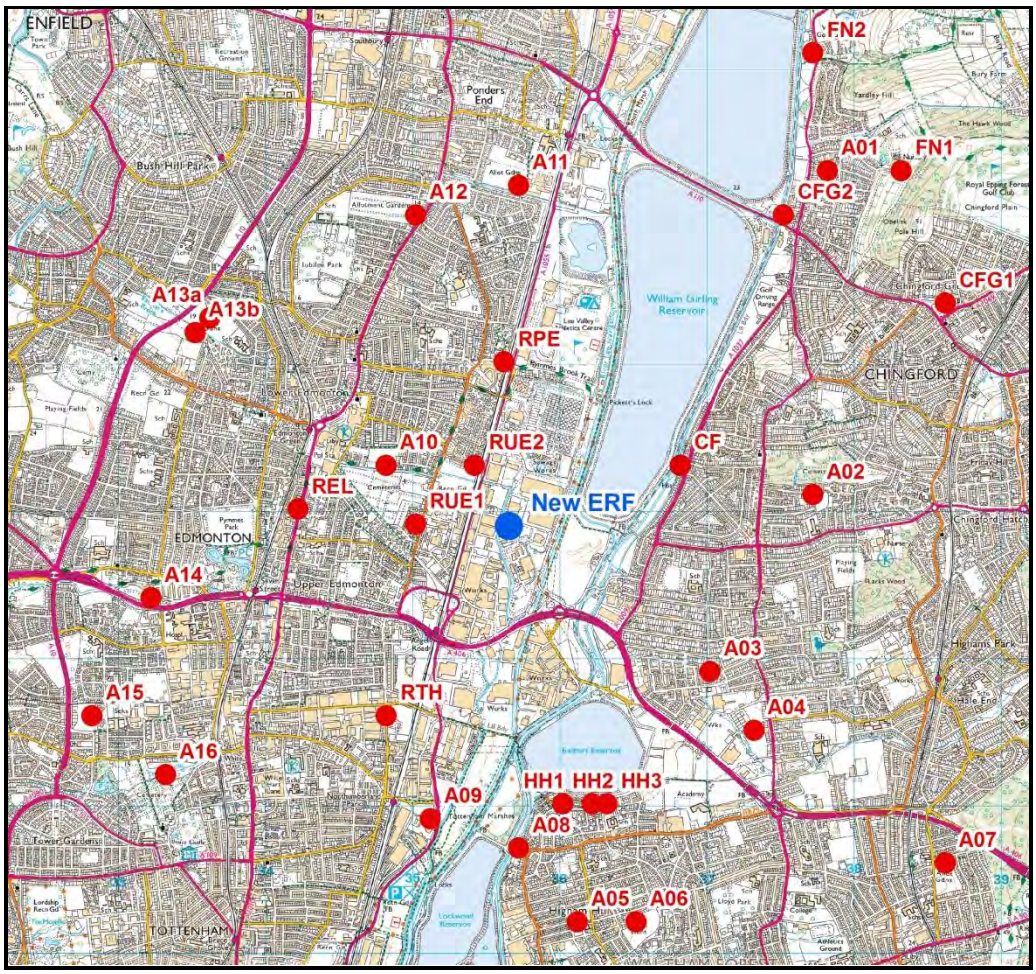
For each type of receptor, up to nine locations are selected based on the maximum predicted airborne concentration, maximum predicted wet deposition rate and maximum dry deposition rate for gas, particle and particle bound phases. These maxima are often co-located, however, and each receptor type could have between one and nine identified receptor locations per defined area.

For the proposed ERF, seventeen residential allotment receptors, two farmer receptors and eleven residential receptors have been assessed. For all of the receptor types, adult and child receptors have been considered. The locations of the allotment, resident and farmer receptors are presented in *Figure 4.1* and described in *Table 4.1*. At other locations not specifically considered in the assessment, the predicted hazards and risks would be lower than predicted for the discrete receptors considered.

TABLE 4.1 SENSITIVE RECEPTORS CONSIDERED FOR THE HHRA

Receptor Name	Code	Grid Reference	
		x	y
Allotment A01	A01	537818	195318
Allotment A02	A02	537718	193118
Allotment A03	A03	537018	191918
Allotment A04	A04	537318	191518
Allotment A05	A05	536118	190218
Allotment A06	A06	536518	190218
Allotment A07	A07	538618	190618
Allotment A08	A08	535718	190718
Allotment A09	A09	535118	190918
Allotment A10	A10	534818	193318
Allotment A11	A11	535718	195218
Allotment A12	A12	535018	195018
Allotment A13a	A13a	533618	194318
Allotment A13b	A13b	533518	194218
Allotment A14	A14	533218	192418
Allotment A15	A15	532818	191618
Allotment A16	A16	533318	191218
Farmer North 1	FN1	538318	195318
Farmer North 2	FN2	537718	196118
Resident Chingford	CF	536818	193318
Resident Chingford Green 1	CFG1	538618	194418
Resident Chingford Green 2	CFG2	537518	195018
Resident Higham Hill 1	HH1	536018	191018
Resident Higham Hill 2	HH2	536218	191018
Resident Higham Hill 3	HH3	536318	191018
Resident Lower Edmonton	REL	534218	193018
Resident Ponders End	RPE	535618	194018
Resident Tottenham	RTH	534818	191618
Resident Upper Edmonton 1	RUE1	535018	192918
Resident Upper Edmonton 2	RUE2	535418	193318

FIGURE 4.1 LOCATION OF THE ALLOTMENT, RESIDENT AND FARMER RECEPTORS



4.2 ASSESSMENT OF NON-CARCINOGENIC AND CARCINOGENIC RISK

4.2.1 Non-carcinogenic Risk

The non-carcinogenic effect of the emissions on human health can be assessed in terms of the *Hazard Quotient* (HQ). For ingestion, the HQ is calculated as the Average Daily Dose (ADD) divided by the reference dose (RfD). For example, the HQ for ingestion exposure for cadmium (Cd) is calculated as follows:

$$HQ_{Ing,\,Cd} = \frac{ADD_{Ing,\,Cd}}{RfD_{Ing,\,Cd}}$$

Where:

$$ADD_{Ing,\,Cd} = \frac{I_{Ing,\,Cd} \bullet ED \bullet EF}{AT \bullet 365}$$

Where: $ADD_{Ing,\ Cd}$ = ingestion dose for cadmium; ED is the exposure duration (dependent on the receptor type); EF is the exposure frequency (350 days per year); and AT is the averaging time (equal to ED for non-carcinogenic effects and 70 years for carcinogenic risks).

For inhalation, the HQ is calculated as the exposure concentration divided by the reference concentration (RfC). For example, the HQ for inhalation exposure for cadmium (Cd) is calculated as follows:

$$HQ_{Inh,Cd} = \frac{EC_{Cd} \bullet 0.001}{RfC_{Inh,Cd}}$$

Where:

$$EC_{Cd} = \frac{C_a \bullet ED \bullet EF}{AT \bullet 365}$$

Where: EC_{Cd} is the exposure concentration (µg m^{-3}), $RfC_{Inh,\ Cd}$ is the reference concentration for cadmium (mg m^{-3}) and C_a is the concentration of cadmium in air.

The Reference Dose and Reference Concentration for each COPC and exposure pathway are provided in *Section 3.2*. The RfDs and RfCs are set conservatively, that is they are protective of health and doses at or greater than the RfD or RfC indicate the potential for effect, rather than clear and certain indication of an effect. For example, should the maximum daily intake for the new source, in this case the ERF, be equal to the RfD, then the HQ would be equal to 1.0 and this would indicate the potential for a health effect. On the other hand, a hazard quotient of less than unity (1.0) implies that such an exposure would not create an adverse non-carcinogenic health effect.

The *Hazard Index* (HI) is the sum of the individual COPC/pathway HQs and assumes that there are no synergistic or antagonist health effects arising from the release. The smaller the HI, the less risk to human health is implied.

4.2.2 Carcinogenic Risk

The risk of interest in this context is the extra lifetime risk associated with the total dose resulting from exposure to the Project emissions. For each COPC, the US EPA has calculated a carcinogenic slope factor (CSF). These are calculated for ingestion exposure whereas for inhalation exposure, a unit risk factor (URF) has been adopted. A summary of the factors used for this assessment is provided in *Section 3.2*. Where the CSF or URF is zero, this indicates that the COPC is non-carcinogenic via that exposure route. The IRAP model uses these values to calculate a cancer risk for each pollutant and for each pathway for exposure, so that the results can be expressed in a high degree of detail.

The risk associated with the ingestion exposure (food, water and soil) to cadmium is calculated as follows:

$$Risk_{Ing,\,Cd} = ADD_{Ing,\,Cd} \bullet CSF_{Ing,\,Cd}$$

Where $ADD_{Ing,\ Cd}$ is the sum of the average daily dose from all ingestion exposure routes.

The risk associated with the inhalation of cadmium is calculated as follows:

$$Risk_{Inh,\,Cd} = EC_{Cd} \bullet URF_{Inh,\,Cd}$$

4.3 IMPACT ASSESSMENT FOR THE PROPOSED ERF

4.3.1 Assessment of Non-carcinogenic Effects – Proposed ERF

The Hazard Index (HI) calculated by IRAP for emissions from the proposed ERF for each of the receptors (adult and child) is presented in *Table 4.2* (highest values for each receptor type are picked out in bold type). For the allotment receptors, the maximum HI is presented which was predicted at Allotment 10.

TABLE 4.2 HAZARD INDEX FOR RESIDENT AND FARMER RECEPTORS - PROPOSED ERF

Receptor Name	Hazard Index (HI) – Proposed ERF	
	Adult	Child
Allotment A10	**0.00098**	**0.0018**
Farmer North 1	**0.0037**	**0.0049**
Farmer North 2	0.0035	0.0046
Resident Chingford	**0.0021**	**0.0035**
Resident Chingford Green 1	0.00084	0.0014
Resident Chingford Green 2	0.00080	0.0014
Resident Higham Hill 1	0.00036	0.00065
Resident Higham Hill 2	0.00036	0.00066
Resident Higham Hill 3	0.00036	0.00066
Resident Lower Edmonton	0.0011	0.0019
Resident Ponders End	0.00096	0.0020
Resident Tottenham	0.00038	0.00071
Resident Upper Edmonton 1	0.0019	0.0034
Resident Upper Edmonton 2	0.0017	0.0033
Criterion	*1.0*	

The HIs are well below unity (1.0) and so it is highly unlikely that emissions of COPCs from the Project would cause an adverse non-carcinogenic health risk.

For the proposed ERF, the highest HI is predicted for the Farmer North 1 Child and is a factor of around 200 less than unity. The maximum residential HI is 0.0035 for Resident Chingford (child) and is a factor of 286 less than unity. The highest allotment HI occurs at A10, approximately 950 m to the west-northwest of the proposed ERF. This is a 556 less than unity. Despite being located further from the emission source, predicted HIs for farmers are higher than for the allotment and residential receptors, because of the consumption of animal products.

4.3.2 Assessment of Carcinogenic Effects – Proposed ERF

The total lifetime risk calculated by IRAP for emissions from the ERF for each of the receptors (adult and child) is presented in *Table 4.3.*

TABLE 4.3 TOTAL LIFETIME RISK FOR ALLOTMENT, FARMER AND RESIDENT RECEPTORS

Receptor Name	Lifetime Risk – Proposed ERF	
	Adult	Child
Allotment A10	**1.0×10^{-7}**	**5.4×10^{-8}**
Farmer North 1	**2.3×10^{-6}**	**5.0×10^{-7}**
Farmer North 2	2.2×10^{-6}	4.7×10^{-7}
Resident Chingford	**2.0×10^{-7}**	**1.0×10^{-7}**
Resident Chingford Green 1	8.0×10^{-8}	4.0×10^{-8}
Resident Chingford Green 2	8.5×10^{-8}	4.4×10^{-8}
Resident Higham Hill 1	3.8×10^{-8}	2.0×10^{-8}
Resident Higham Hill 2	3.8×10^{-8}	2.0×10^{-8}
Resident Higham Hill 3	3.8×10^{-8}	2.0×10^{-8}
Resident Lower Edmonton	1.1×10^{-7}	5.6×10^{-8}
Resident Ponders End	1.2×10^{-7}	6.4×10^{-8}
Resident Tottenham	4.2×10^{-8}	2.2×10^{-8}
Resident Upper Edmonton 1	2.0×10^{-7}	1.0×10^{-7}
Resident Upper Edmonton 2	1.9×10^{-7}	1.0×10^{-7}
Criterion	7.0×10^{-5}	

For the proposed ERF, the highest carcinogenic risk is predicted for Farmer North 1 (adult) and Resident Chingford (adult). The additional, total, **lifetime** risks to these receptors are 2.3×10^{-6}, (1 in 434,800) and 2.0×10^{-7} (1 in 5,000,000), respectively. Expressed as an **annual** risk, these risk estimates become 1 in 30,436,000 for Farmer North 1 and 1 in 350,000,000 for Resident Chingford, assuming a lifetime of 70 years. Such risks are well within an annual risk of 1×10^{-6} (1 in 1 million), conventionally considered to be acceptable for industrial regulation in the UK [4]. For the Allotment A10 (adult),

4 Risk Assessment for Environmental Professionals, CIWEM Publication (December 2001)

the lifetime risk is 1.0 x 10^{-7} (1 in 10,000,000) which is equivalent to an annual risk of 1 in 700,000,000.

4.3.3 Exposure to Dioxins, Furans and Dioxin-like PCBs – Proposed ERF

Comparison of Dioxin/Furan Exposure with WHO and UK Guidance

The World Health Organization (WHO) recommends a tolerable daily intake for dioxins/furans of 1 to 4 pg I-TEQ kg-BW^{-1} d^{-1} (picogrammes as the International Toxic Equivalent per kilogram bodyweight per day) [5]. The TDI represents the tolerable daily intake for lifetime exposure and short-term excursions above the TDI would have no consequence provided that the average intake over long periods is not exceeded. The average (lifetime) daily intake of dioxins/furans for the receptors considered is presented in *Table 4.4*. These are also compared to the Committee on Toxicity (COT) TDI of 2 pg I-TEQ kg-BW^{-1} d^{-1} for dioxins, furans and dioxin-like PCBs. These are also presented as a percentage of the Committee on Toxicity (COT) TDI of 2 pg I-TEQ kg-BW^{-1} d^{-1} in *Figure 4.2* for the Allotment A10, Farmer North 1 and Resident Upper Edmonton 2 receptors, where highest exposures are predicted.

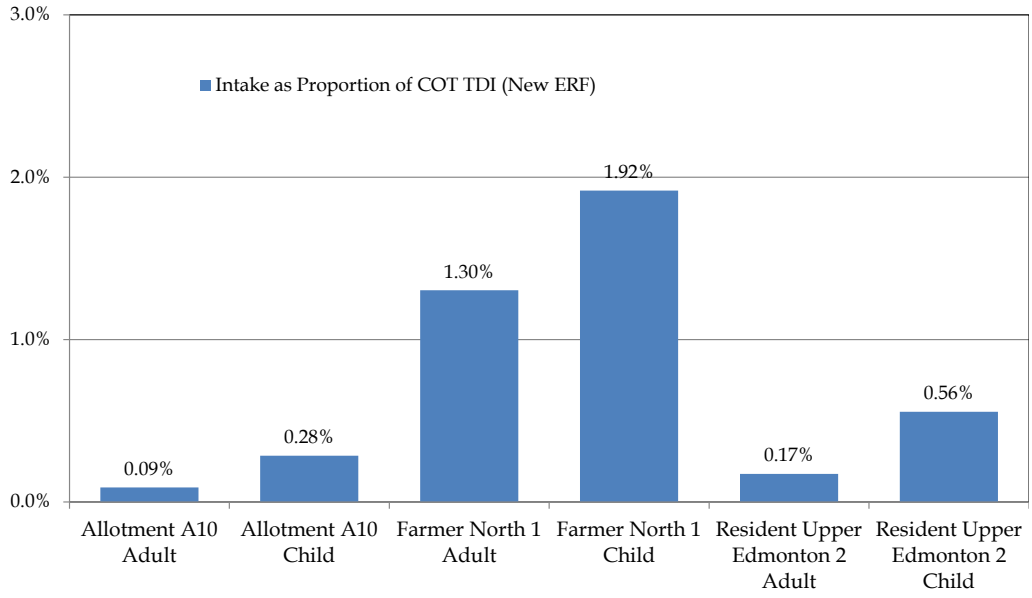
TABLE 4.4 COMPARISON OF AVERAGE DAILY INTAKES WITH THE UK AND WHO'S TDI FOR DIOXINS/FURANS (pg I-TEQ kg-BW^{-1} d^{-1})

Receptor Name	Proposed ERF	
	Adult	Child
Allotment A10	0.0018	0.0057
Farmer North 1	0.026	0.038
Farmer North 2	0.025	0.036
Resident Chingford	0.0032	0.010
Resident Chingford Green 1	0.0013	0.0040
Resident Chingford Green 2	0.0014	0.0046
Resident Higham Hill 1	0.00064	0.0021
Resident Higham Hill 2	0.00065	0.0021
Resident Higham Hill 3	0.00065	0.0021
Resident Lower Edmonton	0.0018	0.0057
Resident Ponders End	0.0022	0.0070
Resident Tottenham	0.00073	0.0023
Resident Upper Edmonton 1	0.0033	0.011
Resident Upper Edmonton 2	0.0035	0.011
WHO TDI	*1 to 4 pg I-TEQ kg-BW^{-1} d^{-1}*	
Committee on Toxicity (COT) TDI	*2 pg I-TEQ kg-BW^{-1} d^{-1}*	

5 Assessment of the Health Risk of Dioxins: Re-evaluation of the Tolerable Daily Intake (TD), WHO Consultation, May 25-29 1998, Geneva, Switzerland

For the proposed ERF, the contribution of the ERF to the COT TDI is less than 2.0 per cent for the farmer receptors, 0.3 per cent for the Allotment receptors and less than 0.6 per cent for the residential receptors.

FIGURE 4.2 PREDICTED INTAKE OF DIOXINS AND FURANS FOR THE FARMER, ALLOTMENT AND RESIDENT RECEPTORS AS A PERCENTAGE OF THE COMMITTEE ON TOXICITY TOLERABLE DAILY INTAKE



Total Intake

The contribution of the ERF to total intake is provided as follows:

- predicted incremental intake due to emissions from the ERF;
- average daily background intake (i.e. that arising from other sources), referred to as the mean daily intake (MDI);
- the total intake (i.e. the sum of the predicted incremental intake and the MDI);
- a comparison of the total intake with the TDI for dioxin/furans.

For all receptors, the total intakes are presented in *Table 4.5*. Results are presented for both adult and child receptors.

TABLE 4.5 COMPARISON OF TOTAL INTAKE WITH THE COT TDI – PROPOSED ERF

Receptor	Total Intake from the ERF (pg I-TEQ kg^{-1} d^{-1})	Total Intake Facility + MDI (pg I-TEQ kg^{-1} d^{-1})	Facility as percentage of TDI	Total Intake as percentage of TDI
Adult Receptors				
Allotment A10	0.0018	0.70	0.09 per cent	35.1 per cent
Farmer North 1	0.026	0.73	1.30 per cent	36.3 per cent
Farmer North 2	0.025	0.72	1.23 per cent	36.2 per cent
Resident Chingford	0.0032	0.70	0.16 per cent	35.2 per cent
Resident Chingford Green 1	0.0013	0.70	0.06 per cent	35.1 per cent
Resident Chingford Green 2	0.0014	0.70	0.07 per cent	35.1 per cent
Resident Higham Hill 1	0.00064	0.70	0.03 per cent	35.0 per cent
Resident Higham Hill 2	0.00065	0.70	0.03 per cent	35.0 per cent
Resident Higham Hill 3	0.00065	0.70	0.03 per cent	35.0 per cent
Resident Lower Edmonton	0.0018	0.70	0.09 per cent	35.1 per cent
Resident Ponders End	0.0022	0.70	0.11 per cent	35.1 per cent
Resident Tottenham	0.00073	0.70	0.04 per cent	35.0 per cent
Resident Upper Edmonton 1	0.0033	0.70	0.17 per cent	35.2 per cent
Resident Upper Edmonton 2	0.0035	0.70	0.17 per cent	35.2 per cent
Child Receptors				
Allotment A10	0.0057	2.11	0.28 per cent	105.3 per cent
Farmer North 1	0.038	2.14	1.92 per cent	106.9 per cent
Farmer North 2	0.036	2.14	1.81 per cent	106.8 per cent
Resident Chingford	0.010	2.11	0.50 per cent	105.5 per cent
Resident Chingford Green 1	0.0040	2.10	0.20 per cent	105.2 per cent
Resident Chingford Green 2	0.0046	2.10	0.23 per cent	105.2 per cent
Resident Higham Hill 1	0.0021	2.10	0.10 per cent	105.1 per cent
Resident Higham Hill 2	0.0021	2.10	0.10 per cent	105.1 per cent
Resident Higham Hill 3	0.0021	2.10	0.10 per cent	105.1 per cent
Resident Lower Edmonton	0.0057	2.11	0.28 per cent	105.3 per cent
Resident Ponders End	0.0070	2.11	0.35 per cent	105.4 per cent
Resident Tottenham	0.0023	2.10	0.12 per cent	105.1 per cent
Resident Upper Edmonton 1	0.011	2.11	0.53 per cent	105.5 per cent
Resident Upper Edmonton 2	0.011	2.11	0.56 per cent	105.6 per cent
COT TDI	*2*	*2*	-	-

The MDI is derived from data provided by the Environment Agency [6] and a value of 49 pg WHO-TEQ d^{-1}. The MDI for an adult receptor and child receptor is calculated as follows:

- for an adult receptor a MDI of 0.7 pg I-TEQ kg^{-1} d^{-1} [7] is derived by dividing the Environment Agency MDI by a bodyweight of 70 kg;
- for a child receptor a MDI of 2.1 pg I-TEQ kg^{-1} d^{-1} is derived by dividing the Environment Agency MDI by a bodyweight of 15 kg and applying an adult to child correction factor of 0.65.

For the child receptor, the MDI for dioxin/furans exceeds the TDI without the contribution from the ERF. However, in deriving the MDI for the child receptors, a bodyweight of 15 kg has been used in order to be consistent with the IRAP predictions which assume a bodyweight of 15 kg. As a consequence the MDI is higher than it would be for a 20 kg child (typically assumed in the UK) and also represents a worst case. For a 20 kg child (adult to child correction factor of 0.74) the MDI for a child would be 1.8 pg I-TEQ kg^{-1} d^{-1} and below the COT TDI.

For inhalation and oral intake of PCDD/Fs for adults, total intake is well below the TDI. Background exposure represents approximately 35 per cent of total exposure. At worst, the ERF contributes 1.3 per cent to the TDI for adults.

For inhalation and oral intake of PCDD/Fs for children, the background intake is in excess of the TDI. At worst the additional contribution from the ERF for a child is 0.038 pg TEQ kg^{-1} d^{-1} (1.9 per cent of the COT TDI). Combined with the background exposure for a 20 kg child (1.8 pg TEQ kg^{-1} d^{-1}) the total intake would be below the TDI (91.9 per cent). Furthermore, it should be noted that the TDI for PCCD/Fs is set for the purposes of assessing lifetime exposure and these elevated background exposures for children are therefore not representative of long term exposure. For other children of farmers, the predicted intake is less than 0.1 per cent of the TDI and the total intake would be 90.1 per cent of the TDI with 90 per cent from background exposure.

Infant Breast Milk Exposure to Dioxins and Furans

Another exposure pathway of interest is infant exposure to PCDDs (polychlorinated di benzo(p)dioxins) and PCDFs (polychlorinated dibenzofurans) via the ingestion of their mother's breast milk. This is because the potential for contamination of breast milk is particularly high for dioxin-

6 Soil Guideline Values for dioxins, furans and dioxin-like PCBs in soil, Environment Agency, Science Report SC050021/Dioxins SGV, September 2009

7 No correction is provided between the WHO-TEF and the I-TEF but a sensitivity analysis indicates that correcting between the two systems would have negligible impact on the results

like compounds such as these, as they are extremely lipophilic (fat soluble) and hence likely to accumulate in breast milk. Further, the infant body weight is smaller and it could be argued that the effect is therefore proportionately greater than in an adult.

This exposure is measured by the Average Daily Dose (ADD) on the basis of an averaging time of 1 year. In the US, a threshold value of 50 pg kg^{-1} d^{-1} of 2,3,7,8-TCDD TEQ is cited as being potentially harmful. The IRAP model calculates the ADD that would result from an adult receptor breast feeding an infant. A summary of the ADD for each of the infants of the adult receptors considered for the assessment is presented in *Table 4.6*.

For the proposed ERF, the highest ADDs are calculated for the infants of the farmer receptors and represent at worst less than 0.6 per cent of the US EPA criterion of 50 pg kg^{-1} d^{-1} of 2,3,7,8-TCDD. The calculated ADDs for residential receptors are lower compared to the farmer since the most significant exposure to dioxins/furans is via the food chain, particularly animals and animal products. The farmer receptors are assumed to consume contaminated meat and dairy products. The allotment and residential receptors, however, are only assumed to consume vegetable products which are less significant with regard to exposure to dioxins/furans.

TABLE 4.6 ASSESSMENT OF THE AVERAGE DAILY DOSE FOR A BREAST-FED INFANT OF AN ADULT RECEPTOR – PROPOSED ERF

Receptor Name	**Average Daily Dose from Breast Feeding (pg kg^{-1} d^{-1} of 2,3,7,8-TCDD)**
Allotment A10	0.017
Farmer North 1	0.30
Farmer North 2	0.28
Resident Chingford	0.031
Resident Chingford Green 1	0.012
Resident Chingford Green 2	0.014
Resident Higham Hill 1	0.0063
Resident Higham Hill 2	0.0064
Resident Higham Hill 3	0.0064
Resident Lower Edmonton	0.018
Resident Ponders End	0.021
Resident Tottenham	0.0071
Resident Upper Edmonton 1	0.032
Resident Upper Edmonton 2	0.034
US EPA Criterion	*50*
WHO criterion	*1 to 4*
UK criterion (COT)	*2*

For the proposed ERF, the ADDs for the infants of the farmer receptors are up to 15 per cent of the COT criterion. The duration of exposure is short, however, and the average daily intake over the lifetime of the individual would be substantially less. Highest exposure is predicted for infants of Farmer North 1 adults, for whom lifetime exposure would consist of the following components:

- One year as a breast fed infant at 0.30 pg I-TEQ kg-BW^{-1} d^{-1};
- Five years as a child farmer at 0.038 pg I-TEQ kg-BW^{-1} d^{-1};
- 40 years as an adult farmer at 0.026 pg I-TEQ kg-BW^{-1} d^{-1};
- 24 years as an adult resident at 0.0035 pg I-TEQ kg-BW^{-1} d^{-1} (worst-case).

This would result in a total average (lifetime) daily intake of 0.023 pg I-TEQ kg-BW^{-1} d^{-1}. This is well below COT TDI and the lower range of the WHO TDI, which is set specifically for lifetime exposure.

The WHO recognises that breast-fed infants would be exposed to higher intakes for a short duration, but also that breast feeding itself provides associated benefits.

4.4 CUMULATIVE IMPACT ASSESSMENT

4.4.1 Introduction

A cumulative assessment has been carried out for the operation of the Proposed ERF and previous operation of the existing EfW facility. The existing EfW facility has operated for approximately 44 years. As a consequence, it will have operated prior to the introduction of stricter controls on emissions from municipal waste incinerators in 1996 which restricted emissions to 1 ng Nm^{-3} and further regulation in 2003 restricting emissions to the current limit of 0.1 ng m^{-3}. However, it is considered that historical exposure to dioxins (i.e. prior to 1996 will be accounted for in background exposure). Therefore, cumulative effects from exposure to the existing ERF are assessed for the plant operating for 20 years but with emissions at the current emission limit of 0.1 ng Nm^{-3}. For present day exposure this represents a worst-case as average emissions during 2014 indicated that actual emissions were 0.007 ng Nm^{-3} (7 per cent of the emission limit). In addition, the assessment assumes that the existing EfW facility operates for the next 20 years alongside the proposed ERF rather than the past 20 years. Therefore, no account has been taken of the removal of the existing EfW facility contaminants in soil via degradation, leaching and other processes over the next 20-30 years. Therefore, the cumulative assessment is considered to represent worst-case conditions.

4.4.2 Cumulative Assessment of Non-carcinogenic Effects

The Hazard Index (HI) calculated by IRAP for the combined exposure to emissions from the existing EfW facility emissions and the proposed ERF for each of the receptors (adult and child) is presented in *Table 4.7*.

The HIs for combined exposure to the existing EfW facility and proposed ERF are well below unity (1.0) and so it is highly unlikely that emissions of COPCs from the Project would cause an adverse non-carcinogenic health risk when cumulative impacts are considered. For the combined exposure, the highest HI is predicted for the Farmer North 1 Child and is a factor of around 100 less than unity. The maximum combined residential HI is 0.0035 for Resident Upper Edmonton 1 (child) and is a factor of 222 less than unity. The highest allotment HI occurs at A02, approximately 1.8 km to the east of the Application Site. This is a factor of 357 less than unity.

4.4.3 Cumulative Assessment of Carcinogenic Effects

The total lifetime risk calculated by IRAP for the combined exposure to emissions from the existing EfW facility and the proposed ERF for each of the receptors (adult and child) is presented in *Table 4.8.*

TABLE 4.7 CUMULATIVE HAZARD INDEX FOR RESIDENT AND FARMER RECEPTORS

Receptor Name	Hazard Index (HI)			
	EfW facility Adult	EfW facility Child	Combined Adult	Combined Child
Allotment A02	0.00080	0.0014	0.0016	0.0028
Farmer North 1	0.0031	0.0040	0.0068	0.0089
Farmer North 2	0.0029	0.0038	0.0064	0.0084
Resident Chingford	0.0012	0.0023	0.0033	0.0058
Resident Chingford Green 1	0.00054	0.0010	0.0014	0.0024
Resident Chingford Green 2	0.00054	0.0011	0.0013	0.0026
Resident Higham Hill 1	0.00026	0.00055	0.00061	0.0012
Resident Higham Hill 2	0.00026	0.00055	0.00062	0.0012
Resident Higham Hill 3	0.00026	0.00055	0.00062	0.0012
Resident Lower Edmonton	0.00043	0.00088	0.0015	0.0028
Resident Ponders End	0.00049	0.0012	0.0015	0.0031
Resident Tottenham	0.00024	0.00053	0.00062	0.0012
Resident Upper Edmonton 1	0.00044	0.0011	0.0023	0.0045
Resident Upper Edmonton 2	0.00045	0.0012	0.0021	0.0045
Criterion	*1.0*			

TABLE 4.8 CUMULATIVE TOTAL LIFETIME RISK FOR ALLOTMENT, FARMER AND RESIDENT RECEPTORS

Receptor Name	Lifetime Risk (HI)			
	EfW facility Adult	EfW facility Child	Combined Adult	Combined Child
Allotment A10	3.6×10^{-8}	1.8×10^{-8}	1.4×10^{-7}	7.2×10^{-8}
Farmer North 1	1.4×10^{-6}	3.1×10^{-7}	3.8×10^{-6}	8.1×10^{-7}
Farmer North 2	1.4×10^{-6}	2.9×10^{-7}	3.5×10^{-6}	7.6×10^{-7}
Resident Chingford	1.1×10^{-7}	5.0×10^{-8}	3.1×10^{-7}	1.5×10^{-7}
Resident Chingford Green 1	4.7×10^{-8}	2.2×10^{-8}	1.3×10^{-7}	6.2×10^{-8}
Resident Chingford Green 2	5.3×10^{-8}	2.5×10^{-8}	1.4×10^{-7}	6.9×10^{-8}
Resident Higham Hill 1	2.6×10^{-8}	1.3×10^{-8}	6.4×10^{-8}	3.2×10^{-8}
Resident Higham Hill 2	2.6×10^{-8}	1.3×10^{-8}	6.4×10^{-8}	3.3×10^{-8}
Resident Higham Hill 3	2.6×10^{-8}	1.3×10^{-8}	6.4×10^{-8}	3.3×10^{-8}
Resident Lower Edmonton	4.2×10^{-8}	2.0×10^{-8}	1.5×10^{-7}	7.6×10^{-8}
Resident Ponders End	5.5×10^{-8}	2.8×10^{-8}	1.7×10^{-7}	9.2×10^{-8}
Resident Tottenham	2.5×10^{-8}	1.2×10^{-8}	6.7×10^{-8}	3.5×10^{-8}
Resident Upper Edmonton 1	5.3×10^{-8}	2.7×10^{-8}	2.5×10^{-7}	1.3×10^{-7}
Resident Upper Edmonton 2	5.7×10^{-8}	3.0×10^{-8}	2.5×10^{-7}	1.3×10^{-7}
Criterion	7.0×10^{-5}			

The highest carcinogenic risk for combined exposure to the existing EfW facility and proposed ERF is predicted for Farmer North 1 (adult) and Resident Chingford (adult). The additional, total, **lifetime** risks to these receptors are 3.8×10^{-6}, (1 in 263,200) and 3.1×10^{-7} (1 in 3,225,800), respectively. Expressed as an **annual** risk, these risk estimates become 1 in 18,424,000 for Farmer North 1 and 1 in 225,800,000 for Resident Chingford, assuming a lifetime of 70 years. Such risks are well within an annual risk of 1×10^{-6} (1 in 1 million), conventionally considered to be acceptable for industrial regulation in the UK [8]. For the Allotment A10 (adult), the lifetime risk is 1.4×10^{-7} (1 in 7,142,900) which is equivalent to an annual risk of 1 in 500,000,000.

4.4.4 Combined Exposure to Dioxins, Furans and Dioxin-like PCBs

Comparison of Dioxin/Furan Exposure with WHO and UK Guidance

For combined emissions from the existing EfW facility and proposed ERF, the average (lifetime) daily intake of dioxins/furans is presented in *Table 4.9*. These are also compared to the Committee on Toxicity (COT) TDI of 2 pg I-TEQ kg-BW^{-1} d^{-1} for dioxins, furans and dioxin-like PCBs.

8 Risk Assessment for Environmental Professionals, CIWEM Publication (December 2001)

TABLE 4.9 COMBINED AVERAGE DAILY INTAKES AS A FRACTION OF THE UK AND WHO'S TDI FOR DIOXINS/FURANS (pg I-TEQ kg-BW^{-1} d^{-1})

Receptor Name	Existing EfW facility		Combined Exposure	
	Adult	Child	Adult	Child
Allotment A10	0.00063	0.0020	0.0024	0.0077
Farmer North 1	0.016	0.024	0.042	0.062
Farmer North 2	0.015	0.022	0.040	0.058
Resident Chingford	0.0016	0.0051	0.0048	0.015
Resident Chingford Green 1	0.00069	0.0021	0.0020	0.0062
Resident Chingford Green 2	0.00084	0.0026	0.0023	0.0072
Resident Higham Hill 1	0.00042	0.0013	0.00106	0.0034
Resident Higham Hill 2	0.00042	0.0013	0.00108	0.0034
Resident Higham Hill 3	0.00043	0.0013	0.00108	0.0034
Resident Lower Edmonton	0.00067	0.0021	0.0025	0.0078
Resident Ponders End	0.00097	0.0031	0.0031	0.0101
Resident Tottenham	0.00042	0.0013	0.00115	0.0037
Resident Upper Edmonton 1	0.00096	0.0031	0.0043	0.014
Resident Upper Edmonton 2	0.0011	0.0034	0.0045	0.015
WHO TDI	*1 to 4 pg I-TEQ kg-BW^{-1} d^{-1}*			
Committee on Toxicity (COT) TDI	*2 pg I-TEQ kg-BW^{-1} d^{-1}*			

For the combined exposure to the existing EfW facility and proposed ERF, the contribution to the COT TDI is less than 3.1 per cent for the farmer receptors, 0.4 per cent for the Allotment receptors and less than 0.8 per cent for the residential receptors.

Infant Breast Milk Exposure to Dioxins and Furans

A summary of the ADD for each of the infants of the adult receptors considered for the assessment is presented in *Table 4.10* for combined exposure to the existing EfW facility and proposed ERF.

For the combined exposure, the highest ADDs are calculated for the infants of the farmer receptors and represent at worst less than 1.0 per cent of the US EPA criterion of 50 pg kg^{-1} d^{-1} of 2,3,7,8-TCDD. The calculated ADDs for residential receptors are lower compared to the farmer. Highest residential exposure is predicted for Resident Chingford and is 0.1 per cent of the US EPA criterion.

For the combined exposure, the ADDs for the infants of the farmer receptors are up to 24 per cent of the COT criterion. However, as discussed previously, the duration of exposure is short and the average daily intake over the lifetime of the individual would be substantially less.

TABLE 4.10 ASSESSMENT OF THE COMBINED AVERAGE DAILY DOSE FOR A BREAST-FED INFANT OF AN ADULT RECEPTOR

Receptor Name	Average Daily Dose from Breast Feeding (pg kg^{-1} d^{-1} of 2,3,7,8-TCDD)
Allotment A10	0.023
Farmer North 1	0.48
Farmer North 2	0.45
Resident Chingford	0.047
Resident Chingford Green 1	0.019
Resident Chingford Green 2	0.022
Resident Higham Hill 1	0.010
Resident Higham Hill 2	0.010
Resident Higham Hill 3	0.011
Resident Lower Edmonton	0.024
Resident Ponders End	0.031
Resident Tottenham	0.011
Resident Upper Edmonton 1	0.042
Resident Upper Edmonton 2	0.044
US EPA Criterion	*50*
WHO criterion	*1 to 4*
UK criterion (COT)	*2*

The proposed ERF has a higher contribution (around 67 per cent) compared to the existing EfW facility despite having the same assumed emission concentrations. This is likely due to the poorer dispersion conditions for the proposed ERF due to the worst-case assumptions adopted with regard to the emission temperature and emission velocity.

4.5 ASSESSMENT OF TRANSITION SCENARIO

4.5.1 Introduction

The transition scenario (also referred to as Stage 2 in the EIA) represents the situation where the existing EfW facility is operating at 3/5th and the ERF at 70 per cent. For the air quality assessment this scenario has been modelled. However, for the HHRA it is not appropriate to reduce the emissions for the EfW facility as this will have operated at normal throughput for the previous operational years. Therefore, for the transition scenario it is assumed that the existing EfW facility operates at 100 per cent for 20 years and with the same emissions as assumed for the cumulative assessment. The proposed ERF is assumed to operate for one year with emissions reduced to 70 per cent. This scenario should give lower exposures compared to the cumulative assessment

where the proposed ERF was assumed to operate at 100 per cent emissions and over a period of 30 years.

4.5.2 Assessment of Non-carcinogenic Effects – Transition Scenario

The Hazard Index (HI) calculated by IRAP for the transition scenario for each of the receptors (adult and child) is presented in *Table 4.11* for the transition scenario.

The HIs for the transition scenario are well below unity (1.0) and so it is highly unlikely that emissions of COPCs from the Project would cause an adverse non-carcinogenic health risk when cumulative impacts are considered. The highest HI is predicted for the Farmer North 1 Child and is a factor of around 145 less than unity. The maximum residential HI is 0.0043 for Resident Chingford (child) and is a factor of 232 less than unity. The highest allotment HI occurs at A02, approximately 1.8 km to the east of the Application Site. This is a 454 less than unity. As expected the predicted His are higher than the ERF operating alone due to the additional exposure to the existing EfW facility but lower than the worst-case cumulative assessment of 20 years with the existing EfW facility operating and a further 30 years with the proposed ERF operating.

4.5.3 Cumulative Assessment of Carcinogenic Effects – Transition Scenario

The total lifetime risk calculated by IRAP for each of the receptors (adult and child) is presented in *Table 4.12* for the transition scenario.

TABLE 4.11 HAZARD INDEX FOR RESIDENT AND FARMER RECEPTORS – TRANSITION SCENARIO

Receptor Name	Hazard Index (HI)	
	Adult	Child
Allotment A02	0.0013	0.0022
Farmer North 1	0.0053	0.0069
Farmer North 2	0.0049	0.0065
Resident Chingford	0.0025	0.0043
Resident Chingford Green 1	0.0011	0.0018
Resident Chingford Green 2	0.0010	0.0019
Resident Higham Hill 1	0.00048	0.00089
Resident Higham Hill 2	0.00048	0.00090
Resident Higham Hill 3	0.00049	0.00090
Resident Lower Edmonton	0.0011	0.0019
Resident Ponders End	0.0011	0.0021
Resident Tottenham	0.00048	0.00090
Resident Upper Edmonton 1	0.0016	0.0030
Resident Upper Edmonton 2	0.0015	0.0029
Criterion	*1.0*	

TABLE 4.12 TOTAL LIFETIME RISK FOR ALLOTMENT, FARMER AND RESIDENT RECEPTORS – TRANSITION SCENARIO

Receptor Name	Lifetime Risk (HI)	
	Adult	Child
Allotment A10	1.0×10^{-7}	4.4×10^{-8}
Farmer North 1	2.9×10^{-6}	6.2×10^{-7}
Farmer North 2	2.7×10^{-6}	5.7×10^{-7}
Resident Chingford	2.0×10^{-7}	8.5×10^{-8}
Resident Chingford Green 1	8.4×10^{-8}	3.6×10^{-8}
Resident Chingford Green 2	8.9×10^{-8}	4.0×10^{-8}
Resident Higham Hill 1	4.2×10^{-8}	1.9×10^{-8}
Resident Higham Hill 2	4.2×10^{-8}	1.9×10^{-8}
Resident Higham Hill 3	4.2×10^{-8}	1.9×10^{-8}
Resident Lower Edmonton	9.1×10^{-8}	3.9×10^{-8}
Resident Ponders End	1.0×10^{-7}	4.7×10^{-8}
Resident Tottenham	4.2×10^{-8}	1.9×10^{-8}
Resident Upper Edmonton 1	1.4×10^{-7}	6.1×10^{-8}
Resident Upper Edmonton 2	1.3×10^{-7}	6.2×10^{-8}
Criterion	7.0×10^{-5}	

The highest carcinogenic risk for the transition scenario is predicted for Farmer North 1 (adult) and Resident Chingford (adult). The additional, total, **lifetime** risks to these receptors are 2.9 x 10^{-6}, (1 in 344,800) and 2.0 x 10^{-7} (1 in 5,000,000), respectively. Expressed as an **annual** risk, these risk estimates become 1 in 24,136,000 for Farmer North 1 and 1 in 350,000,000 for Resident Chingford, assuming a lifetime of 70 years. Such risks are well within an annual risk of 1 x 10^{-6} (1 in 1 million), conventionally considered to be acceptable for industrial regulation in the UK [9].

Compared to the cumulative assessment the predicted risk for the transition scenario is lower as the proposed ERF has only been assumed to be operating for one year. However, compared to the proposed ERF alone for some receptors the impact is comparable (e.g. Resident Chingford), higher for the transition scenario (e.g. Farmer North 1) or lower for the transition scenario (e.g. Resident Upper Edmonton 1). This is likely due to the different contributions the existing EfW facility and proposed ERF make at each receptor location since for the transition scenario the greatest impact is due to the 20 year operation of the existing EfW facility.

4.5.4 Combined Exposure to Dioxins, Furans and Dioxin-like PCBs – Transition Scenario

Comparison of Dioxin/Furan Exposure with WHO and UK Guidance

For the transition scenario, the average (lifetime) daily intake of dioxins/furans is presented in *Table 4.13*. These are also compared to the Committee on Toxicity (COT) TDI of 2 pg I-TEQ kg-BW^{-1} d^{-1} for dioxins, furans and dioxin-like PCBs.

9 Risk Assessment for Environmental Professionals, CIWEM Publication (December 2001)

TABLE 4.13 AVERAGE DAILY INTAKES AS A FRACTION OF THE UK AND WHO'S TDI FOR DIOXINS/FURANS (pg I-TEQ kg-BW^{-1} d^{-1}) – TRANSITION SCENARIO

Receptor Name	20 years EfW facility and 1 year Proposed ERF	
	Adult	Child
Allotment A10	0.0010	0.0031
Farmer North 1	0.030	0.043
Farmer North 2	0.028	0.041
Resident Chingford	0.0023	0.0068
Resident Chingford Green 1	0.0010	0.0029
Resident Chingford Green 2	0.0011	0.0034
Resident Higham Hill 1	0.00062	0.0019
Resident Higham Hill 2	0.00063	0.0020
Resident Higham Hill 3	0.00059	0.0018
Resident Lower Edmonton	0.0011	0.0032
Resident Ponders End	0.0014	0.0043
Resident Tottenham	0.00060	0.0018
Resident Upper Edmonton 1	0.0017	0.0049
Resident Upper Edmonton 2	0.0018	0.0053
WHO TDI	*1 to 4 pg I-TEQ kg-BW^{-1} d^{-1}*	
Committee on Toxicity (COT) TDI	*2 pg I-TEQ kg-BW^{-1} d^{-1}*	

As for the assessment of risk, the predicted intakes are lower than for the cumulative assessment but variable when compared to the proposed ERF operating alone.

For the transition scenario, the contribution to the COT TDI is less than 2.2 per cent for the farmer receptors, 0.2 per cent for the Allotment receptors and less than 0.3 per cent for the residential receptors.

Infant Breast Milk Exposure to Dioxins and Furans

A summary of the ADD for each of the infants of the adult receptors considered for the assessment is presented in *Table 4.14* for the transition scenario.

For the combined exposure, the highest ADDs are calculated for the infants of the farmer receptors and represent at worst less than 0.7 per cent of the US EPA criterion of 50 pg kg^{-1} d^{-1} of 2,3,7,8-TCDD. The calculated ADDs for residential receptors are lower compared to the farmer. Highest residential exposure is predicted for Resident Chingford and is less than 0.1 per cent of the US EPA criterion.

For the transition scenario, the ADDs for the infants of the farmer receptors are up to 18 per cent of the COT criterion. However, as discussed previously,

the duration of exposure is short and the average daily intake over the lifetime of the individual would be substantially less.

TABLE 4.14 ASSESSMENT OF THE AVERAGE DAILY DOSE FOR A BREAST-FED INFANT OF AN ADULT RECEPTOR – TRANSITION SCENARIO

Receptor Name	**Average Daily Dose from Breast Feeding (pg kg^{-1} d^{-1} of 2,3,7,8-TCDD)**
Allotment A10	0.010
Farmer North 1	0.35
Farmer North 2	0.32
Resident Chingford	0.023
Resident Chingford Green 1	0.010
Resident Chingford Green 2	0.011
Resident Higham Hill 1	0.0055
Resident Higham Hill 2	0.0055
Resident Higham Hill 3	0.0056
Resident Lower Edmonton	0.011
Resident Ponders End	0.014
Resident Tottenham	0.0056
Resident Upper Edmonton 1	0.017
Resident Upper Edmonton 2	0.018
US EPA Criterion	*50*
WHO criterion	*1 to 4*
UK criterion (COT)	*2*

5 SUMMARY AND CONCLUSIONS

5.1 SUMMARY

5.1.1 Scope of the Assessment

The possible impacts on human health arising from dioxins and furans (PCDD/F), dioxin-like PCBs and trace metals emitted from the proposed ERF have been assessed under the very worst-case scenario, namely that of an individual exposed for a lifetime to the effects of the highest airborne concentrations and consuming mostly locally grown food. This equates to a hypothetical farmer consuming food grown on limited rural areas within the locality. Therefore, this builds a high degree of conservatism into the assessment. The assessment has also identified more plausible pathways of exposure for the individuals considered (e.g. residents). Deposition and subsequent uptake of the compounds of potential concern (COPCs) into the food chain is likely to be the more numerically significant pathway over direct inhalation.

The purpose of the assessment is to determine the impact on human health of the proposed ERF. In addition, consideration has been given to the cumulative impacts arising from the previous operation of the existing EfW facility which will have resulted in the deposition of COPCs to soils which may still be present during the operation of the proposed ERF. Furthermore, a transition stage has been considered where the proposed ERF and existing EfW facility operate together. This is expected to occur for a period of six months but it is assumed that this transition stage occurs for a period of one year.

5.1.2 Non-carcinogenic Health Risks for the Proposed ERF

The Hazard Index (HI) calculated by IRAP are all well below unity (1.0) and so it is highly unlikely that emissions of COPCs from the proposed ERF would cause an adverse non-carcinogenic health risk. For the ERF, the highest HI is predicted for the Farmer North 1 (child) this is a factor of around 200 less than unity. The maximum residential HI is 0.0035 for Resident Chingford (child) and is a factor of 286 less than unity. The highest allotment HI occurs at A10, approximately 950 m to the west-northwest of the proposed ERF. This is a factor of 556 less than unity. Therefore, the exposure to non-carcinogens is assessed as negligible.

5.1.3 Carcinogenic Health Risks for the Proposed ERF

The additional, **lifetime** carcinogenic risk arising from inhalation and ingestion of COPCs was assessed using US EPA cancer potency factors and

unit risk factors, resulting in a worst case estimates for the future operational throughput as follows:

- 2.3×10^{-6} (1 in 434,800) for the farmer;
- 2.0×10^{-7} (1 in 5,000,000) for the resident; and
- 1.0×10^{-7} (1 in 10,000,000) for the allotment.

The assessment of health effects arising from exposure to COPCs indicates that emissions from the proposed ERF do not pose a significant risk to health, given what is considered to be an acceptable level of lifetime risk in the UK, i.e. 1 in 14,300 (i.e. equivalent to an annual risk of 1 in 1,000,000 over a lifetime of 70 years).

5.1.4 Exposure to Dioxins, Furans and Dioxin-like PCBs for the Proposed ERF

For the proposed future operational throughput, the contribution of the ERF to the COT TDI (2 pg I-TEQ kg-BW^{-1} d^{-1}) is less than 2.0 per cent for the farmer receptors, less than 0.3 per cent for the residential receptors and less than 0.6 per cent for the allotment receptors.

5.1.5 Cumulative Impacts of the Existing EfW Facility and the Proposed ERF

The cumulative assessment arising from the previous operation of the existing EfW facility and the future operation of the proposed ERF is considered to represent worst-case conditions with respect to emission concentrations and the accumulation of COPCs in soils.

The HIs for combined exposure to the existing EfW facility and proposed ERF are also well below unity (1.0) and so it is highly unlikely that emissions of COPCs from the Project would cause an adverse non-carcinogenic health risk when cumulative impacts are considered. For the combined exposure, the highest HI is predicted for the Farmer North 1 Child and is a factor of around 100 less than unity.

The highest carcinogenic risk for combined exposure to the existing EfW facility and proposed ERF is predicted for Farmer North 1 (adult) and Resident Chingford (adult). The additional, total, **lifetime** risks to these receptors are 3.8×10^{-6}, (1 in 263,200) and 3.1×10^{-7} (1 in 3,225,800), respectively. Expressed as an **annual** risk, these risk estimates become 1 in 18,424,000 for Farmer North 1 and 1 in 225,800,000 for Resident Chingford, assuming a lifetime of 70 years. Such risks are well within an annual risk of 1×10^{-6} (1 in 1 million),

For the combined exposure to the existing EfW facility and proposed ERF, the contribution to the COT TDI is less than 3.1 per cent for the farmer receptors, 0.4 per cent for the Allotment receptors and less than 0.8 per cent for the

residential receptors. For the farmer receptor, this is approximately 50 per cent higher than for the proposed ERF operating alone.

5.1.6 Assessment of the Transition Scenario

The HIs for the transition scenario are also well below unity (1.0) and so it is highly unlikely that emissions of COPCs from the Project would cause an adverse non-carcinogenic health risk when cumulative impacts are considered. The highest HI is predicted for the Farmer North 1 Child and is a factor of around 145 less than unity.

The highest carcinogenic risk for the transition scenario is predicted for Farmer North 1 (adult) and Resident Chingford (adult). The additional, total, **lifetime** risks to these receptors are 2.9×10^{-6}, (1 in 344,800) and 2.0×10^{-7} (1 in 5,000,000), respectively. Expressed as an **annual** risk, these risk estimates become 1 in 24,136,000 for Farmer North 1 and 1 in 350,000,000 for Resident Chingford, assuming a lifetime of 70 years. Such risks are well within an annual risk of 1×10^{-6} (1 in 1 million).

For the transition scenario, the contribution to the COT TDI is less than 2.2 per cent for the farmer receptors, 0.2 per cent for the Allotment receptors and less than 0.3 per cent for the residential receptors. For the farmer receptor, this is approximately 10 per cent higher than for the proposed ERF operating alone.

5.2 CONCLUSIONS

The risk assessment methodology used in this assessment has been structured so as to create 'realistic' worst case estimates of risk for residents. A number of features in the methodology give rise to this degree of conservatism, most obviously through the assumption that the exposed individual and consumes most of his/her above ground vegetable products derived from this area where deposition would occur. For farmer receptors, the ingestion of home-reared meat and animal products are also considered. This assumes that both arable and pasture land are present within the locality.

For the proposed ERF and the cumulative impacts of the proposed ERF and existing EfW facility, it has been demonstrated that the maximally exposed individual is not subject to a significant carcinogenic risk or non-carcinogenic hazard, arising from exposures via both inhalation and the ingestion of foods.

Series 06 Environmental Statement

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