Medworth Energy from Waste
Combined Heat and Power Facility

PINS ref. EN010110
Document Reference: Vol 5.4
Revision 2.0
July 2023

List of other Consents and Licences

Regulation reference: The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(q)

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Executive Summary

This document lists the other consents that may be required to enable the construction and/or operation of the Proposed Development.

Regulations 5 and 6 of the APFP Regulations provide the statutory requirement for what must accompany a development consent application. These do not include a requirement to submit this document although the application form guidance at paragraph 45 requires that the Applicant briefly describe and list other consents, licences, permits that it may require to enable the Proposed Development to be constructed and operated where the Secretary of State is not the authorising body.

Paragraph 46 of the same document requires the Applicant to set out whether there are, in principle, any reasons why such consents might not be granted and should include any references received from relevant authorising bodies regarding the likelihood of them being granted.

The Applicant has listed at **Table 2.1 Summary of consents and licences** those consents and licences which will or may be required to construction and/or operate the Proposed Development. It has not submitted applications for these consents and licences but foresees no impediment to their approval.

Contents

1. Introduction

1.1 Background

1.1.1 Medworth CHP Limited (the Applicant) is applying to the Secretary of State for a Development Consent Order (DCO) to construct operate and maintain an Energy from Waste (EfW) Combined Heat and Power (CHP) Facility on the industrial estate, Algores Way, Wisbech, Cambridgeshire. Together with associated Grid Connection, CHP Connection, Water Connections, and Temporary Construction Compound (TCC), these works are the Proposed Development.

1.1.2 The Proposed Development would recover useful energy in the form of electricity and steam from over half a million tonnes of non-recyclable (residual), non-hazardous municipal, commercial and industrial waste each year. The Proposed Development has a generating capacity of over 50 megawatts and the electricity would be exported to the grid. The Proposed Development would also have the capability to export steam and electricity to users on the surrounding industrial estate.

1.1.3 The Proposed Development is a Nationally Significant Infrastructure Project (NSIP) under Part 3 Section 14 of the Planning Act 2008 (2008 Act) by virtue of the fact that the generating station is located in England and has a generating capacity of over 50 megawatts (section 15(2) of the 2008 Act). It, therefore, requires an application for a DCO to be submitted to the Planning Inspectorate (PINS) under the 2008 Act. PINS will examine the application for the Proposed Development and make a recommendation to the Secretary of State (SoS) for Business, Energy and Industrial Strategy (BEIS) to grant or refuse consent. On receipt of the report and recommendation from PINS, the SoS will then make the final decision on whether to grant the Medworth EfW CHP Facility DCO.

1.2 The Applicant and the project team

1.2.1 The Applicant is a wholly owned subsidiary of MVV Environment Limited (MVV). MVV is part of the MVV Energie AG group of companies. MVV Energie AG is one of Germany's leading energy companies, employing approx. 6,500 people with assets of around €5 billion and annual sales of around €4.1 billion. The Proposed Development represents an investment of approximately £450m.

1.2.2 The company has over 50-years' experience in constructing, operating, and maintaining EfW CHP facilities in Germany and the UK. MVV Energie's portfolio includes a 700,000 tonnes per annum residual EfW CHP facility in Mannheim, Germany.

1.2.3 MVV Energie has a growth strategy to be carbon neutral by 2040 and thereafter carbon negative, i.e., climate positive. Specifically, MVV Energie intends to:

- reduce its direct carbon dioxide (CO_2) emissions by over 80% by 2030 compared to 2018;
- reduce its indirect CO_2 emissions by 82% compared to 2018;

- be climate neutral by 2040; and
- be climate positive from 2040.

1.2.4 MVV's UK business retains the overall group ethos of 'belonging' to the communities it serves whilst benefitting from over 50 years' experience gained by its German sister companies.

1.2.5 MVV's largest project in the UK is the Devonport EfW CHP Facility in Plymouth. Since 2015, this modern and efficient facility has been using around 265,000 tonnes of municipal, commercial and industrial residual waste per year to generate electricity and heat, notably for Her Majesty's Naval Base Devonport in Plymouth, and exporting electricity to the grid.

1.2.6 In Dundee, MVV has taken over the existing Baldovie EfW Facility and has developed a new, modern facility alongside the existing facility. Operating from 2021, it uses up to 220,000 tonnes of municipal, commercial and industrial waste each year as fuel for the generation of usable energy.

1.2.7 Biomass is another key focus of MVV's activities in the UK market. The biomass power plant at Ridham Dock, Kent, uses up to 195,000 tonnes of waste and non-recyclable wood per year to generate green electricity and is capable of exporting heat.

1.2.8 To prepare the ES for the Proposed Development, the Applicant engaged Wood Group UK Limited (Wood) now known as WSP. WSP is registered with the Institute of Environmental Management and Assessment (IEMA)'s Environmental Impact Assessment (EIA) Quality Mark scheme. The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed.

1.3 The Proposed Development

1.3.1 The Proposed Development comprises the following key elements:

- The EfW CHP Facility;
- CHP Connection;
- Temporary Construction Compound (TCC);
- Access Improvements;
- Water Connections; and
- Grid Connection.

1.3.2 A summary description of each Proposed Development element is provided below. A more detailed description is provided in **ES Chapter 3: Description of the Proposed Development (Volume 6.2)** of the ES. A list of terms and abbreviations can be found in **Chapter 1 Introduction, Appendix 1F Terms and Abbreviations (Volume 6.4)**.

- EfW CHP Facility Site: A site of approximately 5.3ha located south-west of Wisbech, located within the administrative areas of Fenland District Council and

Cambridgeshire County Council. The main buildings of the EfW CHP Facility would be located in the area to the north of the Hundred of Wisbech Internal Drainage Board (HWIDB) drain bisecting the site and would house many development elements including the tipping hall, waste bunkers, boiler house, turbine hall, air cooled condenser, air pollution control building, chimneys and administration building. The gatehouse, weighbridges, 132kV switching compound and laydown maintenance area would be located in the southern section of the EfW CHP Facility Site.

- CHP Connection: The EfW CHP Facility would be designed to allow the export of steam and electricity from the facility to surrounding business users via dedicated pipelines and private wire cables located along the disused March to Wisbech railway. The pipeline and cables would be located on a raised, steel structure.
- TCC: Located adjacent to the EfW CHP Facility Site, the compound would be used to support the construction of the Proposed Development. The compound would be in place for the duration of construction.
- Access Improvements: includes access improvements on New Bridge Lane (road widening and site access) and Algores Way (relocation of site access 20m to the south).
- Water Connections: A new water main connecting the EfW CHP Facility into the local network will run underground from the EfW CHP Facility Site along New Bridge Lane before crossing underneath the A47 (open cut trenching or horizontal directional drilling (HDD)) to join an existing Anglian Water main. An additional foul sewer connection is required to an existing pumping station operated by Anglian Water located to the northeast of the Algores Way site entrance and into the EfW CHP Facility Site.
- Grid Connection: This comprises a 132kV electrical connection using underground cables. The Grid Connection route begins at the 132kV switching compound in the EfW CHP Facility Site and runs underneath New Bridge Lane, before heading north within the verge of the A47 to the Walsoken Substation on Broadend Road. From this point the cable would be connected underground to the Walsoken DNO Substation.

1.4 Purpose of the document

1.4.1 This document lists other the consents that may be required to enable the construction and/or operation of the Proposed Development.

1.4.2 Regulations 5 and 6 of the APFP Regulations provide the statutory requirement for what must accompany a development consent application. These do not include a requirement to submit this document although the application form guidance at paragraph 45 requires that:

"Where the proposed development will also require other consents, licences, permits, etc, to enable it to be constructed and/or operational, and for which the [SoS] is not the authorising body, then the applicant must list and briefly describe these in ...the application. Reference should be given to any that have already been

applied for, and a copy enclosed of any that the applicant may already be in the possession of."

1.4.3 Paragraph 46 of the same document requires the Applicant to set out whether there are, in principle, any reasons why such consents might not be granted and should include any references received from relevant authorising bodies regarding the likelihood of them being granted.

2. Consents and licences required

2.1.1 The following consents, licences and permits may be required:

Table 2.1 Summary of consents and licences

Interest feature/ activity	Summary of legislative context	Consenting/Licencing body
Environmental Permit	The operation of an Energy from Waste CHP Facility requires an Environmental Permit (EP) under the Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No 1154).	Environment Agency via the EP.
Legally protected and controlled species	Many species of animal and plant are protected by law and works that could affect any of these species require special consent. For species protected under The Conservation of Habitats and Species Regulations 2017 (SI 2017 No. 1012) (e.g., bats, great crested newt or otter), licences are required from Natural England for any activities that would injure or kill an animal of a protected species or damage or destroy its breeding site or resting place. For European protected species of plants a licence is required for an activity which results in cutting, uprooting or destroying a plant of that species. Under the Protection of Badgers Act 1992, a licence is required, from Natural England, for any activity that would disturb badgers or their setts. Works that affect species that are protected solely under the Wildlife & Countryside Act 1981 may require a licence from Natural England. The Wildlife & Countryside Act 1981 also includes controls over specified non-native species.	Natural England via appropriate licence.
Land drainage (ordinary watercourse)	Certain works that may affect an 'ordinary watercourse' (i.e., a watercourse which is not designated as a main river) require consent under the Land Drainage Act 1991 and are to be dealt with via the protective provisions within the draft DCO (Volume 3.1).	Hundred of Wisbech Internal Drainage Board (IDB) and King's Lynn IDB

2.2 Record of discussions with Consenting/Licencing bodies.

Environment Agency

2.2.1 Two formal enhanced pre-application meetings have been held with the Environment Agency (26/02/2020 and 02/03/2022). These are discretionary meetings which have been held to clarify specific aspects of the permit application prior to submission to reduce the probability of the permit application not being duly made. The first meeting was more procedural to clarify aspects such as application charges, technical guidance to follow, assessments and other supporting studies required to support the application etc. The second meeting was to discuss and clarify specific aspects of the technical studies, including the approach to chimney height assessment, noise assessment and approach to odour control.

2.2.2 The Applicant's Environmental Permit application submitted to the National Permitting Service on 5 August 2022 included a request for the application to be prioritised due to the proposed installation being a Nationally Significant Infrastructure Project (NSIP). The permit application was accepted for prioritisation on 2 September 2022 on the basis that it will "*help maintain national resilience, national infrastructure and/or is critical for environmental protection*."

2.2.3 Following administration delays, and a request for further information, the Environment Agency accepted the application as duly made on 23 March 2023.

2.2.4 The Applicant now meets with the Environment Agency on a fortnightly basis. At the meeting on 16 June 2023 the Environment Agency confirmed:

- Due to the level of public interest for the DCO Examination, the Environment Agency propose to hold a six-week public consultation between 21 June and 2 August 2023; a standard approach for high public interest energy from waste applications.
- The Environment Agency's Air Quality Monitoring and Assessment Unit (AQMAU) had completed its audit of the air quality assessment. The audit concludes the Applicant's assessment is suitable for supporting determination and, specific to human health, contributions are unlikely to exceed any environmental standard and risks are well within the screening criteria for the protection of human health. The AQMAU report (Appendix A) is submitted for Deadline 6.

2.2.5 Determination of the EP is subject to the Environment Agency's own process and timescales, however the Applicant is hopeful that a "minded to approve" position could be reached before the Examination closes.

Internal Drainage Boards

2.2.6 The relevant IDBs have been engaged throughout the process of designing the Proposed Development. Prior to the submission of the application the requirement for consent under the Land Drainage Act 1991 was discussed with the Hundred of Wisbech Internal Drainage Board (HWIDB) (14 December 2021) and with the Kings Lynn Internal Drainage Board (KLIDB) (26 November 2021). No in-principle objections were raised. Discussions with the KLIDB and to a lesser extent HWIDB

have continued post submission. KLIDB have commented that rather than disapplying S23 and S66 of LDA the Applicant should rely upon the protective provision, as this will be the instrument through which any consents are issued. This position is applied to both the KLIDB and HWIDB.

Natural England

2.2.7 No legally protected and controlled species have been identified during the course of ecological survey such that it is anticipated that a licence for any activity which might disturb them. Natural England has confirmed within the Statement of Common Ground between the Applicant and Natural England (Volume 9.9) [REP4-011] that that there are currently no protected species constraints (such as bat roosts, water vole burrows or badger setts) identified within the Order Limits and that there is therefore, currently no reason to agree a draft licence application(s) with Natural England or obtain an associated Letter of No Impediment.

Appendix A
The Environment Agency's Air Quality Monitoring and Assessment Unit

Air Quality Modelling & Assessment Unit (AQMAU)

Environment Agency

AQMAU reference: AQMAU-C2456-WD01

Project title: Medworth Energy from Waste CHP Facility

Work title: Audit of air quality impact assessment and HHRA

Date requested: 27/01/2023

AQMAU response date: 07/04/2023 draft
19/04/2023 final

AQMAU recommendation	Conditions / noted
• The consultant's numerical predictions and conclusions regarding human health can be used for permit determination.	• Contributions from the proposed development are unlikely to exceed any Environmental Standard set for the protection of human health. • Predicted risks as a consequence of dioxins and furans emissions are well within the screening criteria for the protection of human health. • The consultant has used the Best Available Techniques Associated Emission Levels (BAT-AELs) from the Reference Document on the Best Available Techniques (BREF) published in 2019, Industrial Emissions Directive (IED) Annex VI Part 3 and MVV Devonport monitoring data to model emissions from the facility.
• The consultant's numerical predictions and conclusions for assessment of ecological receptors against critical levels and critical loads can be used for permit determination.	• Contributions from the proposed EfW CHP are unlikely to exceed any critical levels and critical loads set for the protection of habitats.

Detailed response and evidence starts on Page 2

1. Summary of work request

1.1 The National Permitting Service Installations Team asked the Air Quality Modelling and Assessment Unit (AQMAU) to audit an Air Quality Assessment (AQA)[1] completed by Wood Group UK Limited (the consultant) in support of a new permit application (EPR/ HP3441QA/A001) on behalf of Medworth CHP Limited (the applicant). We have referred to their Environmental Statement[2] as part of our assessment. The applicant intends to operate and maintain an Energy from Waste (EfW) Combined Heat and Power (CHP) Facility on the industrial estate, Algores Way, Wisbech, Cambridgeshire.

1.2 The proposed development would recover useful energy in the form of electricity and steam from over half a million tonnes of non-recyclable (residual), non-hazardous municipal, commercial and industrial waste each year. The facility has a generating capacity of over 50 megawatts and the electricity would be exported to the grid. The facility would also have the capability to export steam and electricity to users on the surrounding industrial estate.

2. Conclusions that lead to AQMAU recommendations

2.1 The assessment includes a review of baseline pollution levels, dispersion modelling of emissions from the proposed development and determination of the significance of the impact of these emissions on local air quality and ecological receptors. The assessment also includes a Human Health Risk Assessment of dioxins and furans, and dioxin-like PCBs intakes.

2.2 In relation to human health and ecology the consultant concludes that:

- For all pollutants, either the process contributions (PCs) are insignificant, or the predicted environmental concentrations (PECs) are well below the environmental standards (ES) for air at human health receptors.
- For all pollutants, impacts at ecological receptors are screened out.
- Abnormal emissions will not give rise to an unacceptable impact on air quality.
- The impacts of dioxins and furans, and dioxin-like PCBs are not significant.

2.3 We have audited the consultant's assessments and have made several observations relating to the validity of their assumptions and the model setup. We have conducted our own check modelling including sensitivity analysis to our observations. As a result, we find that:

- For all pollutants, either PCs screen out as insignificant or PECs are below the ES at relevant human health receptors.
- Abnormal emissions will not have a significant impact on air quality.
- The impact of dioxins and furans and dioxin-like PCBs emissions are not likely to be significant.
- For all pollutants, PCs screen out as insignificant at all relevant ecological sites.

2.4 We therefore agree with the consultant's conclusions with respect to human health and ecological assessment.

[1] Medworth Energy from Waste Combined Heat and Power Facility, PINS ref. EN010110, Document Reference: Vol 6.4, Revision 2.0, February 2023
[2] Environmental Statement Chapter 8: Air Quality, Medworth Energy from Waste Combined Heat and Power Facility, PINS ref. EN010110, Document Reference: Vol 6.2 Revision 1.0, June 2022

3. Evidence for Conclusions

Air Quality Assessment

3.1 The consultant has carried out the air quality impact assessment using air dispersion modelling software ADMS 5 (version 5.2). They have also tested sensitivity using AERMOD to understand potential uncertainty in model predictions. This approach is consistent with our modelling guidance[3].

3.2 They used 5 years of modelled meteorological data from the UK Numerical Weather Prediction (NWP)[4] between 2015 and 2019, extracted at the site location. Observed data is our preferred meteorological data for dispersion models. However, we agree that NWP data is likely to be reasonably representative of the regional meteorology. We have used 5 years of observed data between 2016 and 2020 at Marham RAF. This site is approximately 28 km east of the facility.

3.3 Surface roughness is an input parameter relating to the height of interfering structures that is used in the model to calculate mechanical turbulence affecting atmospheric stability. For all but the unstable categories (where convective turbulence dominates), surface roughness increases the vertical mixing of a plume and changes the wind-speed profile at elevated heights because of the enhanced mechanical turbulence generated as the air moves over the ground. The consultant has used a variable roughness file to reflect the land use in the area surrounding the facility. They have also tested sensitivity to a fixed surface roughness length of 1 m. We have conducted sensitivity to two fixed surface roughness lengths (0.5 m and 1 m) to represent the surface characteristics of the dispersion site. 0.5 m is representative of parkland and open suburbia and 1 m is representative of cities and woodland.

3.4 The proposed EfW CHP facility will have two chimney stacks of 84 m. The consultant has used the combine multiple flues stack option in ADMS to model the two stacks as a single stack. Due to their proximity and similar efflux characteristics, this is likely to be the expected behaviour. However, we have tested sensitivity to separate stacks to consider a more conservative approach.

3.5 The consultant has assessed a scenario in which the EfW CHP operate at maximum capacity for 8760 hours per year with emissions.

3.6 Airflow around buildings may create zones of turbulence and downward mixing on the lee side ('downwash effect'). To account for this, the consultant modelled five onsite structures as shown in Table 8B4.6 of their air quality assessment. The closest receptor is approximately 161 m from the source and therefore downwash effect could influence process contributions at the nearest receptor locations.

3.7 The consultant has identified that the EfW CHP is located in an area where gradients are less than 1 in 10 and hence not included terrain effects. We agree with this approach.

3.8 A total of 338 discrete receptors were used to represent human exposure, they are presented in Annex C. We have checked these locations using our geographical information systems and observe that the consultant has included all receptors that could be susceptible to exposure of emissions from the EfW CHP.

[3] Environmental permitting: air dispersion modelling reports - GOV.UK (www.gov.uk)
[4] A numerical forecast atmospheric model from the UK Met Office based on the deterministic UK forecast model with a resolution of 1.5 km.

3.9 To represent the dispersion site, the consultant modelled a 6 km^2 grid with a 40 m resolution. This resolution is likely to capture relevant maximum gird predictions.

3.10 The consultant has used background data from different air quality networks spread across the UK and Defra background maps for the pollutants considered. We have reviewed the data and can confirm they are reasonably representative. We have however identified some minor differences and have used the most conservative background data for all the pollutants in our check modelling assessments.

3.11 Stack parameters and emission rates are presented in Table 8B4.1 of the AQA. We have several observations:

- The consultant's modelled emissions presented in Table 8B4.1 correspond to the Best Available Techniques Associated Emission Levels (BAT-AELs) from the Reference Document on the Best Available Techniques (BREF) published in 2019[5]. These are lower and therefore more stringent than the Emission Limit Values (ELVs)[6] from the Industrial Emissions Directive (IED)[7], Annex VI, Part 3 for waste incineration plant. We were able to replicate their emission rates for most pollutants. Where we could not replicate the emission rates, we have used the highest calculated emission rates for our sensitivity.
- The consultant has modelled all VOCs as benzene and compared against the benzene environmental standards. The consultant has also assumed all polycyclic aromatic hydrocarbons (PAHs) as Benzo[a]Pyrene (BaP). For BaP, they have used an emission concentration of 0.0047 mg/Nm^3 which is based on measured data from another MVV operated EfW CHP facility in Devonport (Table 8B4.1). We note this and agree that this concentration is reasonably worst-case (Figure 8.121 in 2019 Waste Incineration BREF).
- The consultant has assessed metal emissions as per our Metals Guidance[8]. We agree with this approach.

3.12 The consultant has presented their process contributions (PCs) and predicted environmental concentrations (PECs) to human health for the EfW CHP in Table 8B6.1, to Table 8B6.2 and Table 8B6.3.

- The PCs for pollutants NO_2, PM_{10}, $PM_{2.5}$, and NH_3, is the combined traffic and chimney PCs. For the remaining pollutants the PCs are associated only to the EfW CHP stacks. Traffic emissions are not regulated by the Environment Agency and hence we have not considered them in our assessment.
- Table 8B6.1 of consultant's report presents predictions at the human receptor locations where maximum impact of emissions would occur. We observe that the PCs for annual NO_2, short-term NO_2, hourly SO_2, daily SO_2, 15-minute SO_2, annual VOC as benzene, daily VOC as benzene, short-term HCl, annual Cadmium and annual as B(a)P exceed the respective insignificance criteria. However, the PECs for all pollutants screen out.

[5] Neuwahl, F., Cusano, G., Gómez Benavides, J., Holbrook, S. and Roudier, S. Best Available Techniques (BAT) Reference Document for Waste Incineration: Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control), EUR 29971 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-12993-6 (online), doi:10.2760/761437 (online), JRC118637.

[6] ELVs or any emission concentration mentioned in this report are at reference conditions of 273.15K, 101kPa, 0% moisture and 15% oxygen contents

[7] DIRECTIVE 2010/77/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

[8] Releases from Waste Incinerators – Guidance on assessing group 3 metal stack emissions from incinerators. Version 4. Environment Agency, Jun 2016.

Ecological Assessment

3.13 The consultant has used a screening distance of 15 km for statutory designated areas as per the Environment Agency guidance[9]. With regard to this, they have included Nene Washes Ramsar site, Special Area of Conservation (SAC) and Special Protection Area (SPA) and Ouse Washes Ramsar, SAC and SPA. They have also included River Nene Local Wildlife Sites (LWSs) within 2km of the site. We can confirm that the consultant has included all relevant ecological receptors in their assessment. Our guidance only alludes to 15 km for very large plants or sulphurous combustion activities. Screening distance of 10 km would be applicable for this facility.

3.14 When considering impacts on ecological sites the consultant has used the APIS website[10] to identify the feature habitats, background concentrations and relevant critical levels and critical loads (for nutrient nitrogen and acid deposition). Their acid and nutrient nitrogen deposition predictions have been made following AQTAG06[11] guidelines. The consultant has used the less stringent daily critical level of 200 µg/m^3. They have reviewed that the SO_2 and O_3 concentrations are comfortably below their respective critical levels at the habitat sites. We have checked the critical level and critical load values and are satisfied that they are likely to be representative.

3.15 The consultant has presented their results for long-term and short-term impact on ecological receptors from the EfW CHP in Tables 8B6.4 to Table 8B6.8 of their AQA. Their predictions indicate that;

- PCs for annual and daily NO_X, annual SO_2, daily and weekly HF and annual ammonia are below the insignificance threshold (1% for long-term and 10% for short term) of the relevant critical levels for the say SACs, SPAs, Ramsar sites and SSSIs.
- PCs for annual and daily NO_X, annual SO_2, daily and weekly HF and annual ammonia are below 100% of the relevant critical levels for the local nature sites.
- PCs for nutrient nitrogen deposition and acid deposition are below 1% of the relevant critical loads for the say SACs, SPAs, Ramsar sites and SSSIs.
- PCs for are below 100% of the relevant critical loads for the local nature sites.

Abnormal Emissions Assessment

3.16 In accordance with Article 46 (6) of the IED a plant may be permitted to operate above the ELVs unabated for a period of no more than 4 hours uninterrupted, for up to 60 hours per year. Short-term impacts are of most concern when considering abnormal operations. Emissions during abnormal operation, provided by the consultant are derived from assumptions made to flue gas treatment plant efficiencies. They have presented these in section 4.2.16 of their AQA. Overall, these emissions are consistent with data for abnormal emissions detailed in the Incineration BREF.

3.17 The consultant has reported short term PCs and PECs in Table 8B6.9 of their AQA and they predict that all of the short-term PECs are below the ESs. Note they have assumed

[9] Environment Agency and Department for Environment, Food & Rural Affairs, Environmental management-guidance: Air emissions risk assessment for your environmental permit. 22 March 2023, www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit [Accessed on February 2023]

[10] Air Pollution Information System www.apis.ac.uk [Accessed on February 2023]
[11] AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air, March 2014 (Habitats Directive)

that all abnormal emissions were coincident with the very worst hour in the year for dispersion and are therefore highly conservative.

Human Health Risk Assessment (HHRA)

3.18 The consultant has completed a HHRA of the potential effects on human health due to intake from diet and inhalation of dioxins, furans and dioxin-like PCBs. The HHRA applies approaches to quantify intakes from predicted pollutant concentrations published by the United States Environmental Protection Agency (US EPA) Human Health Risk Assessment Protocol[12] (HHRAP). Tolerable Daily Intake[13] (TDI) value published by the UK Committee on Toxicity (COT) have also been used to assess the predicted health effects at selected receptors. The consultant has assessed 27 residential and 9 farmer receptor locations, presented in Graphic 4.1 and Table 4.1 of their Human Health Risk Assessment[14].

3.19 The consultant disregards the ingestion of fish as a potential pathway stating that "*There are no edible fish farms identified within 5km of the EfW CHP Facility Site… Therefore, the ingestion of locally caught edible fish from an inland closed water source has not been considered as consumption rates are likely to be very small"*. The Environment Agency has an agreed position with UK Health Protection Agency (UKHSA) that intakes from certain metals only need to be assessed if fish consumption is a significant pathway; otherwise, the environmental standards for air emissions are protective for human health. We agree that the ingestion of fish is unlikely to be a significant pathway.

3.20 The consultant has included all relevant pathways in their assessment in accordance with the HHRAP and HMIP 1996. They have considered – inhalation, ingestion of water, soil, vegetation and animals and animal products that become contaminated through the food chain.

3.21 The consultant's congener profile is shown in Table 2.1 of the HHRA report. The mass emissions for each congener in terms of toxic equivalent (I-TEQ) have been based on a standard congener profile for municipal waste incinerators derived by Her Majesty's Inspectorate of Pollution (HMIP)[15]. For dioxin-like PCBs it has been assumed that the entire PCB emissions will comprise of either Aroclor 1016 or Aroclor 1254 depending on which substance gives rise to highest exposure.

3.22 The consultant used proprietary software Lakes IRAP-h View, version 5.1.0 to conduct their HHRA. IRAP-h View implements the US EPA HHRAP. The consultant has used the IRAP tool and the ADMS model output files to calculate intakes at the most sensitive receptors via the inhalation and ingestion pathways.

3.23 We were able to replicate the consultant's emission rates presented in Table 2.2 of their HHRA report. We have conducted our own HHRA screening checks based on the US EPA HHRAP and agree with the consultant's conclusions.

3.24 The COT TDI is 2 pg WHO-TEQ/kg(BW)/day. The TDI is the amount that can be ingested daily over a lifetime without appreciable health risk. The consultant has assessed impacts of dioxins, furans and dioxin-like PCBs against this TDI. Their predicted maximum contribution presented in Table 4.3 is 2.2% of the TDI for an adult, and 6.5%

[12] Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, EPA, 2005.
[13] Committee on toxicity of Chemicals in Food, Consumer Products and the Environment. Tolerable Daily Intake (TDI) of 2 picogrammes toxic equivalent (TEQ) of dioxins and dioxin-like PCBs per kilogramme human body weight per year.
[14] Environmental Statement Chapter 8 Air Quality Appendix 8B, Annex G: Human Health Risk Assessment, June 2022
[15] Table 7.2a DOE (1996) Risk Assessment of Dioxin Releases from Municipal Waste Incineration Processes Contract No. HMIP/CPR2/41/1/181

of the TDI for a child. Since their predictions are below the TDI they conclude that "*It has been demonstrated that for the maximally exposed individual, exposure to dioxins, furans and dioxin-like PCBs is not significant*".". Note that although these predictions are below the UKHSA screening threshold they are overly conservative. They have calculated combined intakes without adjustment for lifetime exposure. Their percentage predictions should therefore not be used to make conclusions against the TDI over a more relevant long term exposure period (e.g. lifetime). We have considered this in our assessment.

3.25 UKHSA (formally Public Health England) have advised that overall, an additional dioxin intake of 10% of the TDI on the consumption by the average or high-level adult consumer is unlikely to result in an exceedance of the TDI, and even if exceedance were to occur, it is unlikely that an additional 10% would result in significant risk. As our checks indicate that the predicted maximum contribution is below 10% of the TDI, we do not regard this as a significant risk to health.

AQMAU Checks

3.26 We carried out check modelling using ADMS 5.2. Our checks included sensitivity of model output and results to the following parameters:

- Sensitivity to AERMOD via the ADMS modelling software
- Our own meteorological data observed at Marham from 2016-2020
- Sensitivity to surface roughness length at the dispersion site of 1 m (corresponding to cities and woodland) and 0.5 m (corresponding to parkland and open suburbia)
- Background data from our own reasonable worst-case analysis.
- The two EfW CHP stacks modelled separately and as a combined stack.
- Lifetime exposure of dioxins, furans and dioxin-like PCBs.

3.27 With regard to sensitive human receptors, our checks indicate that the worst-case PCs for most pollutants are likely to be "insignificant". The PCs are 'not insignificant' for long term NO_2, VOCs as Benzene, PAH as B(a)P, chromium (VI) and cadmium. PCs are 'not insignificant' for short term NO_2, daily SO_2, 1-hour SO_2, 15-minute SO_2, VOCs as Benzene and Vanadium. However, exceedance of the environmental standards are unlikely.

3.28 Although we do not necessarily agree with the consultant's absolute numerical predictions considering expected modelling uncertainties, we agree with their conclusions with respect to normal operation and abnormal operation that the EfW CHP will not cause a breach of any environmental standards.

3.29 With regard to ecological sites, our checks of the designated SACs, SPAs, Ramsar sites and SSSIs (within 10 km) and local nature sites (ancient woods, local wildlife sites and national and local nature reserves) (within 2 km) habitat sites indicate insignificant impacts.

3.30 Our HHRA check modelling indicates that the intakes predicted by the consultant are likely to be well below the 10% insignificance criterion agreed with UKHSA. This also applies to any increased emissions of dioxin, furans and dioxin-like PCB during worst-case abnormal operations. Taking lifetime exposure into account to enable comparisons with the COT-TDI, worst-case predictions are significantly lower than those presented by the consultant.