# FORD ENERGY RECOVERY FACILITY AND WASTE SORTING AND TRANSFER FACILITY, FORD CIRCULAR TECHNOLOGY PARK

ENVIRONMENTAL STATEMENT

**CHAPTER 8**

HEALTH

8

# 8 Health

## Introduction

8.1 Fichtner Consulting Engineers Ltd was appointed to undertake a human health risk assessment (HHRA) of the proposed energy recovery facility (ERF). The findings of the HHRA are summarised in this chapter and the full report forms Technical Appendix E to the ES.

## Legislation and policy

8.2 The following documents were examined for policies that relate to health issues associated with waste management, and particularly ERFs:

- National Planning Policy for Waste (2014)
- National Planning Policy Framework (NPPF; 2019)
- National Planning Practice Guidance: Waste (NPPG; 2015)
- Waste Management Plan for England (2013)
- Our Waste, Our Resources: A Strategy for England (2018)
- West Sussex Waste Local Plan (2014)
- Arun Local Plan 2011-2031 (2018)
- Ford Parish Council Neighbourhood Development Plan 2017-2031 (2018)

8.3 Paragraph 5 of the National Planning Policy for Waste states that local planning authorities should take account of the cumulative impact of existing and proposed waste disposal facilities on the well-being of the local community, including any significant adverse impacts on environmental quality, social cohesion and inclusion, or economic potential. Paragraph 7 states that, when determining waste planning applications, waste planning authorities should consider the likely impact on the environment and amenity and the locational implications of any advice on health from the relevant health bodies.

8.4 The NPPF does not set out any specific waste policies, as national waste planning policy is contained in the above document. However, it states that, when determining applications for waste developments, authorities should have regard to the policies of the NPPF where relevant. The NPPF includes policies relating to promoting healthy and safe communities. The NPPG states that local planning authorities can ensure that waste is handled in a manner that protects human health and the environment by:

- Testing the suitability of proposed sites against criteria set out in the National Planning Policy for Waste
- Putting in place suitable planning conditions and adequate enforcement and monitoring
- Working closely with environmental health colleagues
- Consulting with Public Health England (PHE) and the Environment Agency for advice on public health matters and pollution control

8.5 The *Waste Management Plan for England* and *Our Waste, Our Resources: A Strategy for England* do not contain any specific policies relating to the health impacts of waste management. However, the former highlights the need to *"protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use"* and that waste should be managed *"in a way that guarantees a high level of protection of the environment and human health."*

8.6 Policy W19 of the adopted West Sussex Waste Local Plan states that proposals for waste development will be permitted provided that:

- Lighting, noise, dust, odours and other emissions, including those arising from traffic, are controlled to the extent that there will not be an unacceptable impact on public health and amenity
- Where necessary, a site liaison group is established by the operator to address issues arising from the operation of a major waste management site or facility

8.7 The Arun Local Plan and Ford Parish Council Neighbourhood Development Plan do not contain any policies relating to the potential health impacts of waste management facilities.

**Methodology**

8.8 A detailed HHRA was carried out using the Industrial Risk Assessment Program-Human Health, which is based on the US Environmental Protection Agency's (2005) *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities.* The outputs of the modelling were then assessed using the UK's approach, which is set out in the Environment Agency's (2009) *Human Health Toxicological Assessment of Contaminants in Soil.* The following chemicals of potential concern were identified for the purposes of the assessment:

- Dioxins
- Dioxin-like polychlorinated biphenyls (PCBs)

8.9 These substances have a threshold level for toxicity, meaning that a tolerable daily intake can be defined. This is an estimate of the amount of a contaminant, expressed on a body weight basis, which can be ingested daily over a lifetime without appreciable health risk. A mean daily intake is also defined, which is the typical intake from background sources across the UK. In order to assess the impact of the facility, the predicted intake of a substance as a result of emissions from the ERF is added to the mean daily intake and compared with the tolerable daily intake.

8.10 The assessment examined the possible effects on human health at key receptors, where humans are likely to be exposed to the greatest impact from the facility, and at the point of maximum impact of annual mean emissions. The references and data sources used in the assessment are set out in table 8.1. Full details of the assumptions and inputs used in the modelling are provided in Technical Appendix E.

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|---|
| Defra, 2004, Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes. Extended Summary |
| Environment Agency, 2009, Human Health Toxicological Assessment of Contaminants in Soil |
| Public Health England, 2019, PHE statement on modern municipal waste incinerators (MWIs) study |
| US Environmental Protection Agency, 2005, Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities |

**Table 8.1: References and data sources**

### Limitations and uncertainties

8.11 The HHRA was based on the following conservative assumptions:

- The proposed development will operate continually at the European emission limits, i.e. at the maximum concentrations that it is expected it will be permitted to operate at
- The hypothetical maximum impacted receptor (an agricultural receptor at the point of maximum impact) only ingests food and drink sourced from the area with the maximum contribution from the facility. This accounts for uncertainty in the modelling. To account for uncertainty in the dietary intake of a person, residential, allotment and agricultural receptors were assessed
- The modelling software does not include any data on individual PCBs, but does include data for take-up and accumulation rates within the food chain for two groups of PCBs, each of which is based on a fixed composition of PCBs. As a worst case assumption, the assessment assumed that the PCBs are released in each of the two compositions and the impact has been based on the maximum
- The modelling software does not include these PCB groups when determining the intake for an infant via a mother's breast milk, so a safety factor of 1.5 has been applied to the dioxin and dioixin-like PCB emission rate when considering the impact of the intake via breast milk

### Background to the human health risk assessment

8.12 Defra undertook a review of the environmental and health effects of waste management in 2004. This found that health effects in people living near waste management facilities were either generally not apparent, or the evidence was not consistent or convincing. Where investigations had been carried out but no health effects found, Defra undertook further investigations in response to public concerns. The review did not find a link between the current generation of municipal solid waste incinerators and health effects. Adverse health effects were observed in populations living around older, more polluting incinerators and industrial areas. However, the current generation of ERFs results in a much lower level of exposure to pollutants.

8.13 The study considered cancers, respiratory diseases and birth defects, but no evidence was found for a link between the incidence of disease and the current generation of facilities. The government's independent expert advisory committee on the Carcinogenicity of Chemicals in Food, Consumer Products and the Environment concluded within the study that *"any potential risk of cancer due to residency (for periods in excess of ten years) near to municipal*

*solid waste incinerators was exceedingly low and probably not measurable by the most modern techniques."*

8.14 To put the effects of managing municipal solid waste into context, Defra reported that its management accounts for less than 2.5% of almost all quantifiable emissions in the UK. The exceptions to this were emissions of methane (nearly 30% of total emissions) and cadmium (10% of the national total). Almost all of the cadmium emitted to air from facilities managing municipal solid waste comes from landfill sites.

8.15 Defra also compared the hazards from municipal solid waste management with other health hazards. Fireworks resulted in over 1,000 hospital admissions in 2002. Traffic accidents result in over 3,000 deaths and over 300,000 hospital admissions every year. In comparison, managing municipal solid waste results in approximately five hospital admissions and one death brought forward per year. Defra concluded that, while the information on health and environmental effects of waste management is incomplete and not ideal, the weight of evidence from studies to date is that present-day practices for managing municipal solid waste have, at most, a minor effect on health and the environment.

8.16 PHE's (2019) *Statement on modern municipal waste incinerators (MWIs) study* reviews the findings of three papers published by the Small Area Health Statistics Unit at Imperial College London. It states that no evidence was found of an increased risk of infant mortality for children living close to municipal waste incinerators. No evidence was found of increased risk of congenital anomalies from exposure to stack emissions, but a small potential increase in the risk of congenital anomalies was recorded for children born within 10 km of municipal waste incinerators. However, PHE emphasises that this may well be down to not fully adjusting the study for factors such as other sources of pollution or deprivation, and states that a causal association between the increased risk of congenital anomalies for children born close to municipal waste incinerators has not been established. The statement concludes that *"PHE's risk assessment remains that modern, well run and regulated municipal waste incinerators are not a significant risk to public health."*

## Assessment of effects

### *Introduction*

8.17 The key issue for consideration in the HHRA is the release of substances from the ERF to the atmosphere that have the potential to harm human health. Some pollutants, particularly dioxins and dioxin-like PCBs, accumulate in the environment. This means that inhalation is only one of the potential exposure routes to these substances and impacts cannot be evaluated in terms of their effects on human health by simple reference to ambient air quality standards. An assessment needs to be made of the overall human exposure to the substances by the local population and the risk that this exposure causes.

8.18 The ground level concentrations resulting from emissions from the proposed ERF will be highest in the vicinity of the plant. To account for this, notional adult and child receptors have been assessed at the point of maximum impact. The HHRA in Technical Appendix E also assessed the potential effects at a range of

existing and future receptors in areas predicted to experience the greatest impacts, and the full modelling results are set out in the technical appendix.

***Assessment against the tolerable daily intake at the point of maximum impact***

8.19 Table 8.2 sets out the impact of emissions from the ERF at the point of maximum impact for agricultural, allotment and residential receptors (both adult and child). The agricultural receptor assumes direct inhalation and ingestion from soil, drinking water and home-grown eggs, produce, meat and milk. The allotment receptor assumes direct inhalation and ingestion from soil, drinking water and home grown eggs, produce and poultry. The residential receptor assumes that the person lives at the point of maximum impact and consumes home-grown produce.

| Receptor type | Mean daily intake (% of tolerable daily intake) | Process contribution (% of tolerable daily intake) | Overall (% of tolerable daily intake) |
|---|---|---|---|
| | | ***Adult*** | |
| Agricultural | 35.00% | 2.25% | 37.25% |
| Allotment | 35.00% | 0.07% | 35.07% |
| Residential | 35.00% | 0.05% | 35.05% |
| | | ***Child*** | |
| Agricultural | 90.65% | 3.18% | 93.86% |
| Allotment | 90.65% | 0.20% | 90.85% |
| Residential | 90.65% | 0.16% | 90.81% |

**Table 8.2: Impact analysis – tolerable daily intake at point of maximum impact**

8.20 Table 8.2 shows that the overall impact on both a notional adult receptor and a notional child receptor at the point of maximum exposure (including the contribution from existing dietary intakes) is predicted to be below the tolerable daily exposure for dioxins and dioxin-like PCBs. There will therefore not be an appreciable health risk to either adults or children from the proposed development.

8.21 The total accumulation of dioxins in an infant via breast milk (the only ingestion pathway for an infant receptor), based on an adult agricultural receptor at the point of maximum impact feeding an infant, is predicted to be 0.382 pg WHO-TEQ(1) / kg body weight / day, which is 12.75% of the tolerable daily intake. For allotment and residential receptors, it is only predicted to be 0.39% and 0.24% of the tolerable daily intake respectively. As the process contribution is well below the tolerable daily intake, it is considered that the proposed ERF will not significantly increase health risks from the accumulation of dioxins in infants.

***Assessment against the tolerable daily intake – maximum impact at a receptor***

8.22 Table 8.3 sets out the impact of emissions from the proposed ERF at the most affected receptor (i.e. the receptor with the greatest impact from ingestion and

[1] World Health Organization Toxic Equivalent – a universally accepted system for expressing the toxicity of dioxins, furans and PCBs.

inhalation of emissions from the proposed development). This is receptor R2: Ford Lane 2. This has been conservatively classified as an agricultural receptor.

| Receptor type | Mean daily intake (% of tolerable daily intake) | Process contribution (% of tolerable daily intake) | Overall (% of tolerable daily intake) |
|---|---|---|---|
| | | ***Adult*** | |
| Agricultural | 35.00% | 0.54% | 35.54% |
| | | ***Child*** | |
| Agricultural | 90.65% | 0.76% | 91.41% |

**Table 8.3: Impact analysis – tolerable daily intake at the maximum impacted receptor**

8.23 As shown, the overall impact is below the tolerable daily intake for dioxins and dioxin-like PCBs. There will therefore not be an appreciable health risk to either adults or children from the proposed development at the most affected receptor.

8.24 The total accumulation of dioxins in an infant, based on an agricultural receptor at R2 feeding an infant, is predicted to be 0.092 pg WHO-TEQ / kg body weight / day, which is 3.06% of the tolerable daily intake. As the process contribution is well below the tolerable daily intake, it is considered that the proposed ERF will not significantly increase health risks from the accumulation of dioxins in infants.

8.25 In conclusion, the HHRA found that the operation of the proposed ERF will not result in significant adverse effects on human health at any of the receptors considered, including farms, allotments, residential properties (existing and future) and schools (existing and future).

### Mitigation and monitoring

8.26 As no significant adverse effects are predicted, mitigation and monitoring are not required.

### Residual effects

8.27 No significant residual health effects are predicted as a result of the proposed development.

### Cumulative effects

8.28 There are no locally approved or proposed schemes that have been identified as having the potential for cumulative effects with the stack emissions from the ERF. However, a number of receptor points have been included in the conceptual site model to represent the proposed or allocated residential developments identified as being within the modelling domain. The impact at these receptor points has been incorporated and assessed within the main assessment.

### Fall-back position

8.29 In 2015, Grundon Waste Management Ltd secured planning permission for an energy from waste facility and a materials recovery facility (application reference: WSCC/096/13/F). The application was subject to EIA and was accompanied by a Human Health Risk Assessment written in September 2013. The 2013 Human

Health Risk Assessment stated that the impact of emissions of dioxins and dioxin-like PCBs on human health was predicted to be '*not significant*'. Therefore, the conclusions of the extant permission are consistent with those for the proposed development as presented within the HHRA assessment.