INDAVER

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Consulting Engineers Limited

Rivenhall IWMF

Indaver Rivenhall Limited

EP Variation

ENGINEERING CONSULTING

Document approval

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Non-technical Summary

An Environmental Permit (EP) was granted by the Environment Agency (EA) for the operation of the Rivenhall Integrated Waste Management Facility (Rivenhall IWMF) in September 2017. The EP allowed for the operation of the following waste management facilities:

- CHP plant;
- Anaerobic digestion facility;
- Pulp plant;
- Water treatment plant;
- Mechanical Biological Treatment (MBT) facility; and
- Materials Recovery Facility (MRF).

A variation to the EP was subsequently granted by the EA to reduce the stack height and also to change some of the emission limits for emission to air. In April 2021, the EA granted a Transfer Notice (Ref: CP3906LP) to transfer the EP from Gent Fairhead Limited to Indaver Rivenhall Limited (herein referred to as Indaver).

Due to the complexities associated with the construction of the Rivenhall IWMF, Indaver is constructing the Rivenhall IWMF on a phased basis. The initial earthworks to create the development platform for the Rivenhall IWMF commenced in June 2021, with Phase 1 - construction of the IWMF - commencing in October 2022. Commissioning of the CHP plant is due to commence in September 2025 with handover of the CHP plant, and commercial operation, commencing in March 2026.

Indaver will look to construct the other waste treatment facilities in subsequent phases. At this stage, the future phases of construction have not been fully determined, and will be influenced by the waste treatment facilities being financially viable.

In addition, within the phased construction of the Rivenhall IWMF, Indaver will be reviewing the overall layout to optimise the constructability of the different waste treatment facilities.

For the purposes of this application, the proposed changes are summarised as follows:

- The phased construction and operation of the IWMF.
- Introducing an emission point to water to allow for the discharge of uncontaminated surface water run-off from Upper Lagoon.
- Removing the electricity generation limit as required by Table S1.1, to align with the ongoing application for a Development Consent Order.
- The processing of additional non-hazardous EWC codes within the CHP Plant.

The air quality assessments completed in support of the application indicate that the impact on local air quality would be greater with the phased construction, but overall the air quality impacts can be described as ‘not significant’. On this basis, Indaver understands that the application will be determined as a Substantial Variation.

Contents

1 Introduction

1.1 Background

An Environmental Permit (EP) was granted by the Environment Agency (EA) for the operation of the Rivenhall Integrated Waste Management Facility (Rivenhall IWMF) in September 2017. The EP allowed for the operation of the following waste management facilities:

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- Pulp plant;
- Water treatment plant;
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In April 2021, the EA granted a Transfer Notice (Ref: CP3906LP) to transfer the EP from Gent Fairhead Limited to Indaver Rivenhall Limited (herein referred to as Indaver).

Due to the complexities associated with the construction of the Rivenhall IWMF, Indaver is constructing the Rivenhall IWMF on a phased basis. The initial earthworks to create the development platform for the Rivenhall IWMF commenced in June 2021, with Phase 1 - construction of the IWMF - commencing in October 2022. Commissioning of the CHP plant is due to commence in September 2025 with handover of the CHP Plant, and commercial operation, commencing in March 2026.

Indaver will look to construct the other waste treatment facilities in subsequent phases. At this stage, the latter phases of construction have not been fully determined, and will be influenced by the waste treatment facilities being financially viable.

In addition, within the phased construction of the Rivenhall IWMF, Indaver will be reviewing the overall layout to optimise the constructability of the different waste treatment facilities.

When the EP was originally granted, it was on the basis that all of the waste treatment processes were constructed and operational. Due to the integrated nature of the Rivenhall IWMF all surface water run-off would have been treated in the on-site water treatment plant, to enable it to be utilised within the Pulp Plant. Therefore, the EP was granted on the basis that there would be zero-discharges of water from the IWMF. Due to the phased construction, a new/additional emission point is required to enable the discharge of uncontaminated surface water run-off from Upper Lagoon to the River Blackwater.

In addition to the discharge of uncontaminated surface water run-off, Indaver has applied to the Environment Agency for an Environmental Permit for a package treatment plant for the discharge of treated domestic effluent with the treated wastewater being discharged into Upper Lagoon. The treated domestic effluent will also be discharged to the River Blackwater as part of the effluent stream discharged from Upper Lagoon.

Section 1 of this document provides a brief overview of the application, including the proposed changes and type of variation, whilst section 2 describes the proposed changes in further detail. Section 3 includes a review of the Operating Techniques required to facilitate the proposed changes

to the activities set out in this application. Section 0 summarises the environmental impacts associated with the proposed changes.

1.2 Proposed changes

For the purposes of this application, the proposed changes are summarised as follows:

- The phased construction and operation of the IWMF.
- Introducing an emission point to water to allow for the discharge of uncontaminated surface water run-off from Upper Lagoon.
- Removing the electricity generation limit as required by Table S1.1, to align with the ongoing application for a Development Consent Order.
- The processing of additional non-hazardous EWC codes within the CHP Plant.

The proposed changes are explained in more detail in section 2.

1.3 Type of variation

The Environment Agency's guidance on Charging Schemes states that there are four types of variations – administrative, minor technical, normal and substantial.

Indaver acknowledges that the proposed changes will not constitute either an administrative or minor technical variation.

The Environment Agency has published guidance (Regulatory Guidance Note 8 – Substantial Change) which defines a substantial change. It is acknowledged that the guidance has subsequently been withdrawn but any replacement guidance is not as prescriptive. The guidance defined a substantial change as:

> *'… a change in operation of installations or mining waste facilities, which in our opinion may have significant negative effects on human beings or the environment. Certain changes are automatically regarded as substantial, namely:*
>
> > *a. a change in operation of a Part A installation which in itself meets the thresholds, if any, set out in Part 2 of Schedule 1 EPRs; or*
> >
> > *b. a change in operation of an incineration or co-incineration plant for non-hazardous waste which would involve the incineration or co-incineration of hazardous waste.'*

As detailed in section 5.1, the impact on air quality from the phase construction of the Rivenhall IWMF will result in a greater air quality impact, noting that the total impact can be described as 'not significant'. On this basis, it is understood that the application would be classified as a Substantial Variation by the EA.

2 Proposed changes

2.1 Phased construction of Rivenhall IWMF

Due to the phased construction of the Rivenhall IWMF, the buildings for the different waste processing activities will be constructed as required. The original application had assumed that all of the buildings associated with the Rivenhall IWMF were constructed from the outset.

With the phased construction of the Rivenhall IWMF, Indaver is proposing to construct the different areas of the building as they are required. Therefore, the phased construction of the waste treatment and processes and the buildings will influence the dispersion of emissions from the stack.

Taking this into consideration, the impact of emissions from the CHP Plant, and the phased construction of the buildings has been assessed, refer to Appendix C.

2.2 Additional emission point to water

The paper pulp process is a significant consumer of water. To minimise the consumption of mains water it was proposed to harvest rainwater and process effluents from the different waste treatment processes for re-use within the Pulp plant. On this basis, the Rivenhall IWMF was conceived as having zero-discharges to water, with surface water run-off being collected in Upper Lagoon to enable it to be harvested for re-use within the Rivenhall IWMF.

With the phased construction of the Rivenhall IWMF, until the Pulp Plant and associated water treatment plant are commissioned, there will not be a significant demand for water from the IWMF. Taking this into consideration, it will be necessary to discharge uncontaminated surface water run-off from building roofs and areas of hardstanding collected in Upper Lagoon to the River Backwater.

Taking this into consideration, the information contained in the original EP application, and referenced as the Operating Techniques within Tabel S1.2 of the EP, relating to emissions to water from the Rivenhall IWMF have been reviewed and updated to reflect the interim position prior to construction of the Pulp plant and associated water treatment plant, refer to section 3.

2.3 Removing electricity generation constraints

Activity AR7 within Table S1.1 of the EP includes the following 'limit' on electricity and steam generation from the CHP plant:

> *Generation of electrical power (49 MWe) and heat (35 MW) using a steam turbine from energy recovered from the flue gases.*

Indaver has recently applied for a Development Consent Order (DCO) to enable the CHP plant to increase the electricity generation to more than 50MWe.

At the design point, the CHP plant will be designed to generate up to 62.37 MWe. However, the electricity generation can fluctuate for short periods depending on the NCV of the waste being processed and the local climatic conditions.

The increase in electrical generating capacity will be accommodated by a more efficient energy recovery system and steam turbine, and would not change any of the Operating Techniques associate with the operation of the CHP Plant of the IWMF.

The proposed increase in electricity generation capacity will enable Indaver to maximise the energy recovery from the CHP plant and ensure that the IWMF can achieve the highest level of energy efficiency available.

2.4 CHP Plant - Additional EWC Codes

Indaver would propose to incorporate the following EWC codes within the EP for the CHP Plant. The waste pre-acceptance and acceptance procedures would be updated to incorporate any additional checks on the incoming waste associated with any additional risks associated with the additional EWC codes.

The additional EWC codes would be received and processed as per all existing EWC codes. Therefore, the additional EWC codes would not require any additional storage or handling arrangements.

Table 1: Additional EWC codes to be processed in the CHP plant

EWC code	Description of waste
03 03 01	Waste bark and wood
03 03 07	Mechanically separated rejects from pulping of waste paper and cardboard
03 03 08	Wastes from sorting of paper and cardboard destined for recycling
04 02 09	Wastes from composite materials (impregnated textile, elastomer, plastomer)
04 02 10	Organic matter from natural products (for example grease, wax)
04 02 21	Wastes from unprocessed textile fibres
04 02 22	Wastes from processed textile fibres
15 01 01	Paper and cardboard packaging
15 01 02	Plastic packaging
15 01 03	Wooden packaging
15 01 05	Composite packaging
15 01 06	Mixed packaging
15 01 09	Textile packaging
15 02 03	Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
17 02 01	Wood
17 02 03	Plastic
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
18 01 04	Wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)
18 01 09	Medicines other than those mentioned in 18 01 08
19 08 01	Screenings
19 08 14	Sludges from other treatment of industrial waste water other than those mentioned in 19 08 13
20 01 08	Biodegradable kitchen and canteen waste

EWC code	Description of waste
20 01 10	Clothes
20 01 11	Textiles
20 01 25	Edible oil and fat
20 01 28	Paint, inks, adhesives and resins other than those mentioned in 20 01 27
20 01 30	Detergents other than those mentioned in 20 01 29
20 01 32	Medicines other than those mentioned in 20 01 31
20 01 36	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35
20 01 38	Wood other than that mentioned in 20 01 37
20 01 39	Plastics
20 02 01	Biodegradable waste

Indaver would only accept waste materials which would otherwise be suitable for recycling, such as plastics, paper/carboard or wood, where it is contaminated, and therefore, not suitable to be processed for recycling.

3 Review of Operating Techniques

A Review of Operating Techniques (refer to Appendix B), as referenced within the Table S1.2 of the EP has been undertaken to identify any modifications required to facilitate the proposed changes as set out in this application, so that they can be reflected as the 'interim' Operating Techniques for the Facility to allow for the phased construction as explained within this application.

4 Waste Incineration BREF

Indaver understands that the Rivenhall IWMF will be classed as an 'existing facility' for Waste Incineration BREF compliance purposes. In accordance with the requirements of the Environmental Permitting Regulations, Indaver understands that it is required to demonstrate how it will comply with the requirements of the Waste Incineration BREF prior to commencement of operation.

Whilst Indaver has not provided any details on how it will comply with the requirements of the Waste Incineration BREF within this application, it is committed to making a separate submission to the Environment Agency setting out how the CHP plant will comply with the relevant BAT Conclusions.

5 Environmental Assessments

5.1 Emissions to Air

Revised air quality assessments have been undertaken to determine the air quality impacts associated with the proposed phased construction of the Rivenhall IWMF, refer to Appendix C.

As explained within the assessments, of the regulated activities there are emissions to air from the CHP Plant, the Pulp Plant, the AD gas engines, and AD biofilter, noting that the emissions from the Pulp Plant just contain moisture from the drying process and not any combustion products, and the emissions from the AD biofilter do not contain any combustion products. These all vent to atmosphere via a common stack containing a flue from each source. Therefore, the dispersion of emissions from the stack will depend upon the sourcing operating.

As the presence of buildings can affect the dispersion of the emissions from the stack, the assessment has considered the effect of the phased construction as set out within this application to take into account the changes the size of the building and the sources venting to atmosphere via the common stack.

In relation to the impact on human health, the assessment has shown that:

1. The greatest impact on local air quality would occur if only the CHP Plant was operational and only the building constructed to allow for the CHP Plant.
2. There would generally be a lower impact with the full IWMF operating compared to the CHP Plant due to increased dispersion as a result of combining the emissions from the Pulp Plant, AD gas engines and biofilter.
3. Although the impact on local air quality would be greater with the phased approach emissions will not cause a breach of any AQAL and the total impact can be described as ‘not significant’.
4. There is no risk of exceeding an AQAL for any metal either on a long or short term basis.

In relation to the impact on ecologically sensitive sites, the assessment has shown that:

1. No European or UK designated receptors have been identified as requiring assessment, only six local wildlife sites.
2. At all local ecological sites, the contribution from the IWMF either when fully operational, or with a partial build out, can be screened out ‘insignificant’ as it is less than the Critical Levels and Critical Loads.

In summary, the assessment has shown that whilst the development of only the CHP Plant would result in a slightly greater impact on local air quality the impact would not be significant.

5.2 Emissions to Water

The overall drainage systems for CHP plant will be installed for the Rivenhall IWMF as set out in the original EP application. However, as explained in section 2.2, surface water run-off which is collected within the surface water drainage systems which will be collected in the Upper Lagoon will be pumped to the River Blackwater.

Therefore, the only emission to water from the Rivenhall IWMF will be of uncontaminated surface water run-off which will be collected in Upper Lagoon prior to being pumped to the River Blackwater. The proposed emission point for emissions to water is identified as W1 within the emission point drawing provided in Appendix A.

As the only water which will be discharged into Upper Lagoon is uncontaminated surface water run-off, there will be pollutants/contaminants being released to the aquatic environment from this discharge; therefore, it will not impact on the water quality of the water in the River Blackwater.

5.3 Noise

A noise assessment was submitted in support of the original EP application. The assessment was undertaken in accordance with the requirements of BS: 4142, and included for the operation of all of the permitted activities at the Rivenhall IWMF. The assessment concluded that the operation of the Rivenhall IWMF would not have a significant impact on sensitive noise receptors.

As concluded in the noise assessment the Rivenhall IWMF will not result in unacceptable noise impacts. In constructing the Rivenhall IWMF on a phased basis, the potential sources of noise will be added as/when each waste management activity is commissioned. On this basis, the noise assessment submitted in support of the original EP application is considered to be a conservative assessment of noise impacts allowing for the phased construction of the Rivenhall IWMF.

Furthermore, in accordance with the requirements of Pre-operational Condition 11 within the EP, Indaver is required to submit a programme of proposed noise monitoring to the EA which will cover the commissioning and operational phase of the IWMF to verify the predicted noise impacts set out within the original EP application.

5.4 Odour

The proposed phased construction of the Rivenhall IWMF will not result in any additional odour risks. Pre-operational Condition PO9, requires the submission of an updated Odour Management Plan at least six months prior to commencement of commissioning of each activity listed in the EP.

Taking this into consideration, following completion of design of the CHP plant, Indaver proposes to submit an updated Odour Management Plan to the EA for approval by March 2025. The updated Odour Management Plan will take into consideration, the odour abatement systems incorporated into the design and operation of the CHP plant.

Furthermore, in accordance with the requirements of the PO9, Indaver will be required to update and submit the Odour Management Plan to the EA, at least six months prior to commissioning, of the waste treatment activities which are installed after the CHP Plant has been commissioned.

This was discussed with the EA during pre-application discussions, and it was agreed that it would not be necessary for the updated Odour Management Plan within this application as the control for odour abatement from the CHP Plant will not be changing from the phased construction.

On this basis, Indaver proposes to submit an updated Odour Management Plan following completion of detailed design of the CHP plant and at least six months prior to commissioning of the CHP plant.

5.5 Energy Efficiency

Due to the phased construction of the Rivenhall IWMF, the CHP plant will not be able to export heat to the other waste treatment processes – the Pulp plant and the Water treatment plant – until these on-site heat users become ‘available’ for the export of heat.

Taking this into consideration, the energy efficiency of the CHP plant has been considered on the basis that it was only to operate in condensing more, i.e. electricity only. Furthermore, Indaver has recently applied for a DCO to increase the electricity generation capacity of the CHP plant.

Therefore, the assumed implementation of the DCO has also been considered within this application.

A Sankey Diagram to allow for the CHP plant operating at the design-case electrical output as applied for within the DCO is presented in Figure 1. A larger version is provided in Appendix A.

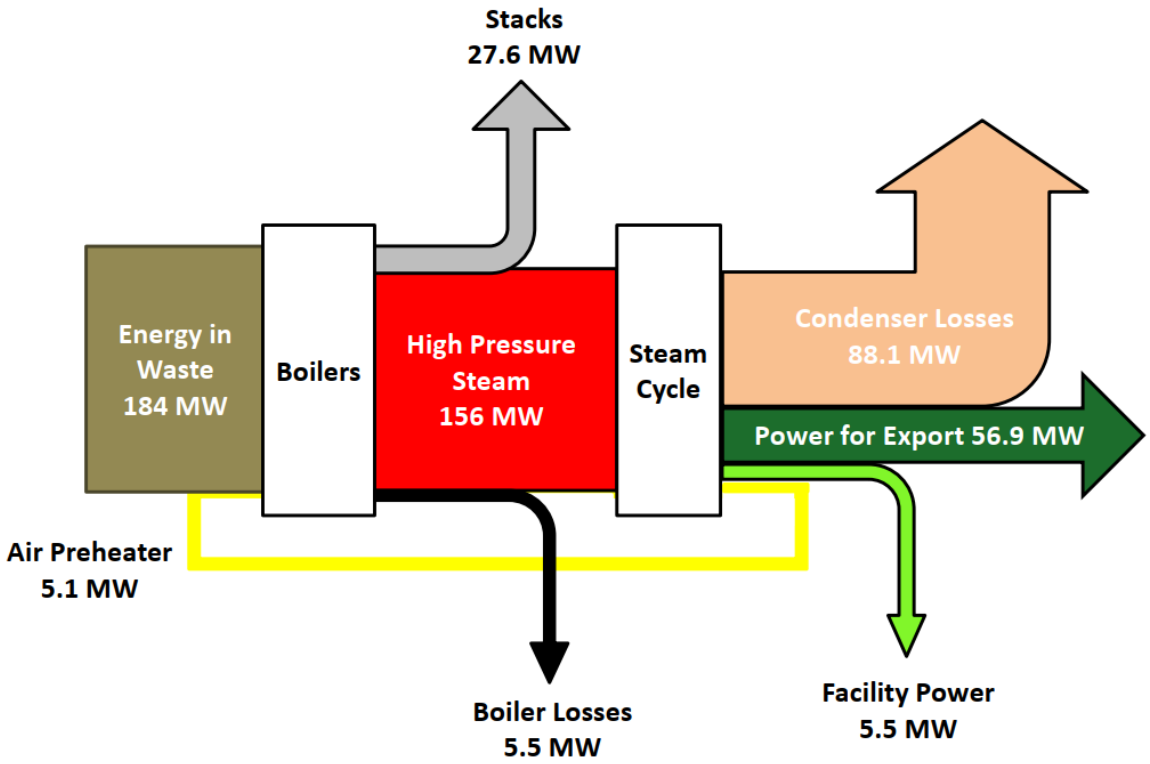

Figure 1- Indicative Sankey Diagram - No heat export case

Therefore, based on an assumed availability of 8,000 hours per annum, the CHP plant will generate up to 498,960 MWh per annum and export up to 455,200 MWh per annum.

As presented in Table 2, the design figures are compared with the benchmark data for MSW incineration plants, given in the Environment Agency Sector Guidance Note EPR5.01 and in the BREF for Waste Incineration (WI BREF). As can be seen, the allowing for the increase in electricity generation being applied for within the DCO, the design of the CHP plant is in accordance with the benchmark values provided in the BREF and EPR5.01.

Table 2: Facility design parameters comparison table

Parameter	Unit	DCO electricity generation	Benchmark	Source
Net power generation, design capacity (595,000 tpa)	MWh/t waste	0.83	0.6 – 0.9	BREF
Internal power consumption, design capacity (595,000 tpa)	MWh/t waste	0.074	0.06 – 0.19	BREF

Parameter	Unit	DCO electricity generation	Benchmark	Source
Power generation (assumed gross) for 100,000 tpa of waste (595,000 tpa)	MWe	9.56	5 – 9	EPR5.01

On this basis, when operating in a 'No heat export' case, the CHP plant will operate in accordance with the benchmark values provided in the BREF and EPR5.01.

Finally, the CHP plant will be classed as an 'existing' plant in accordance with the BREF as an EP was granted prior to the publication of the Waste Incineration BREF and construction of the IWMF commenced prior to the publication of the 'UK Interpretation Document for the 2019 Waste incineration BAT Conclusions'. When operating in a 'No heat export' case, the CHP plant will achieve a gross electrical efficiency of 33.9% which is in excess of the bottom end of the BAT-AEEL range for 'existing plants' as defined in the Waste Incineration BREF.

5.6 Fire Prevention

The proposed phased construction of the Rivenhall IWMF will not result in any additional fire risk. Pre-operational Condition PO10, requires the submission of an updated Fire Prevention Plan at least six months prior to commencement of commissioning of each activity listed in the EP.

Taking this into consideration, following completion of design of the CHP plant, Indaver proposes to submit an updated Fire Prevention Plan to the EA for approval by March 2025. The updated Fire Prevention Plan will take into consideration, the odour abatement systems incorporated into the design and operation of the CHP plant.

Furthermore, in accordance with the requirements of the P10, Indaver will be required to update and submit the Fire Prevention Plan to the EA, at least six months prior to commissioning of the waste treatment activities which are installed after the CHP Plant has been commissioned.

This was discussed with the EA during pre-application discussions, and it was agreed that it would not be necessary for the updated Fire Prevention Plan within this application as the controls for fire prevention from the CHP Plant or the MRF will not be changing from the phased construction.

On this basis, Indaver proposes to submit an updated Fire Prevention Plan following completion of detailed design of the CHP plant and at least six months prior to commissioning of the CHP plant.

Appendices

A Plans and drawings

B Review of Operating Techniques

C Air Quality Assessments

D EU skills certificate

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