Indaver Rivenhall IWMF DCO

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ES CHAPTER 3: PROPOSED DEVELOPMENT AND CONSTRUCTION

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Indaver Rivenhall Ltd

Leading the field in sustainable waste management.

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3 Proposed Development and Construction

3.1 Introduction

3.1.1 This chapter provides a description of the Proposed Development which forms the basis of this ES and has been written by Quod, based on information provided by the principal designer, Hitachi Zosen Inova (HZI), and other members of the project team. This is supported by Appendix 3.1: Works Plan (**ES Volume 2, Doc Ref. 6.2**).

3.1.2 A description of the anticipated construction programme and a description of proposed key construction activities is provided at the end of this chapter.

3.2 Overview of the Proposed Development

3.2.1 The Applicant is applying for development consent to increase the generating capacity of the EfW which forms part of the consented Rivenhall IWMF. At present, the Consented Scheme is restricted to the generation of up to 49.9MW of electricity. Due to improvements in plant design since the grant of the planning permission for the Consented Scheme, it is now possible for more than 49.9MW of electricity to be generated from the same amount of waste with the installation of different plant.

3.2.2 The Proposed Development seeks to extend the generating capacity to more than 50MW by implementing engineering operations to allow a greater proportion of steam to reach the electricity-generating turbine. It is indicatively assumed that the Proposed Development will allow for the EfW plant to operate at a generating capacity between 60MW and 65MW. The Proposed Development will only comprise engineering works carried out internally within the consented IWMF building. There will be no changes to the external appearance of the IWMF, and no additional throughput of waste is required to achieve the uplift. This means that there would be no associated increase in emissions or vehicle movements (associated with the delivery of waste to the IWMF Site).

3.2.3 The engineering operations comprise the implementation of one of two work options. Both options will be consented through the DCO. The work option implemented is dependent on the timing of the granting of the DCO relative to the installation and commissioning phases of the EfW in the Consented Scheme. Work Option No.1 would be used in the event that the EfW's inlet control valves have been installed at the Site under the Consented Scheme before the grant of the DCO. Work Option No.1 would then function to allow the removal at the Site of the mechanical limitation in the installed inlet control valves. In the event that the limited inlet control valves in the consented EfW have not been installed by the date that the DCO has been granted, the limitation would be removed from the valves in the factory and Work Option No.2 would then allow those unlimited valves to be installed at the Site.

3.2.4 The Works Options comprise:

- **Work Option No.1** – an extension to the existing generating station at the Rivenhall Integrated Waste Management Facility (I.e. the EfW plant) with the effect that, once extended, the extended EfW plant would have a gross installed generating capacity above 50MW, comprising the following works:
  - (a) mechanical modifications to the actuated steam turbine inlet control valves to allow steam capacity to be increased.
- **Work Option No.2** – an extension to the existing generating station at the Rivenhall Integrated Waste Management Facility (I.e. the EfW plant) with the effect that, once extended, the extended EfW plant would have a gross installed generating capacity above 50MW, comprising the following works:
  - (a) installation of unrestricted actuated steam turbine inlet control valves with a capacity above 50MW.

3.2.5 The location of either Work Option within the Consented Scheme is illustrated in Figure 3.1.

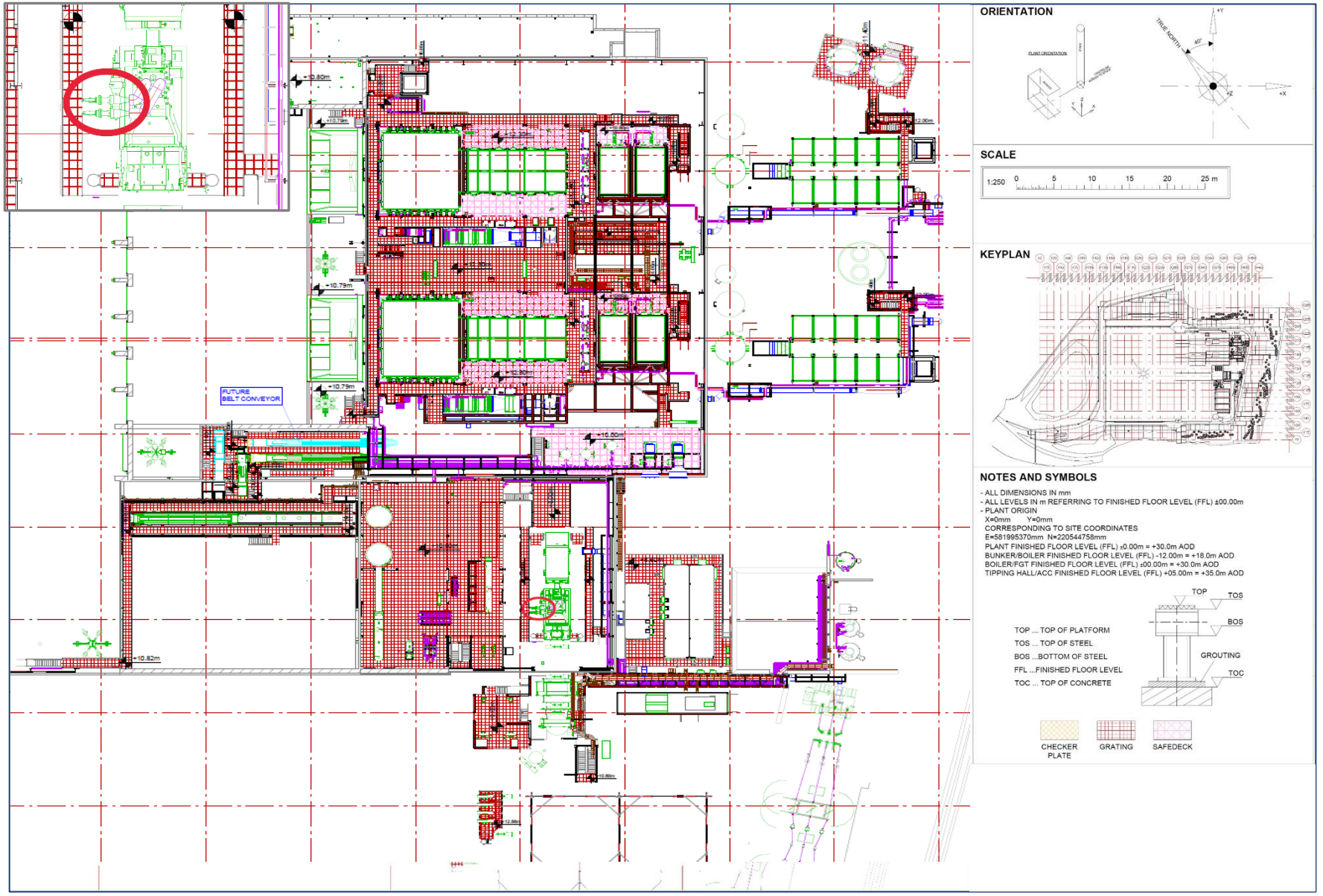
3.2.6 Once the relevant Work Option has been installed and commissioned, it is anticipated that the likely generating capacity of the EfW plant will be approximately 60MW to 65MW.

3.2.7 The works associated with the Proposed Development are located within the extent of the EfW plant as illustrated in Figure 2.1. The Works Plan is provided within **ES Volume 2, Appendix 3.1: Works Plan (Doc Ref. 6.2)**.

3.2.8 The planning permission for the Consented Scheme includes planning conditions that control the construction, commissioning, operation and decommissioning of the Consented Scheme to mitigate its environmental impacts. It is intended that the DCO for the Proposed Development will include requirements that cross-refer to any relevant planning conditions to ensure that these mitigation measures also apply to the Proposed Development.

3.2.9 To the extent that the EIA for the Proposed Development identifies additional mitigation measures required in relation to the Proposed Development, these will be secured through requirements in the DCO or through development consent obligations in an agreement pursuant to Section 106 of the Town and Country Planning Act 1990 (as amended)[1].

Figure 3.1: Location of Proposed Development within Consented Scheme



3.3 Operational Process

3.3.1 The EfW plant in the Consented Scheme produces electricity by feeding steam into a turbine that powers a generator. The steam is generated by passing hot flue gases produced by the combustion of waste through a boiler, which heats water to produce high pressure steam whilst simultaneously cooling the flue gases. The flue gases are sent through a comprehensive flue gas treatment system to reduce the concentration of pollutants to well below the permitted emission levels set out in the Environmental Permit, before they are released to the atmosphere through a stack. This process will remain unchanged as a result of the Proposed Development.

3.3.2 The steam produced by the boiler is either: (i) fed into the turbine, expanded to lower pressure, condensed back into water in an aero-condenser and recirculated into the boiler to be re-heated by the hot flue gases; or (ii) directed via a bypass valve to be cooled and condensed back into water in an aero-condenser and recirculated into the boiler to be re-heated by the hot flue gases without entering the turbine. Electricity can only be generated from steam that is sent to the turbine. The condensation and recirculation of steam back to the boiler does not generate electricity.

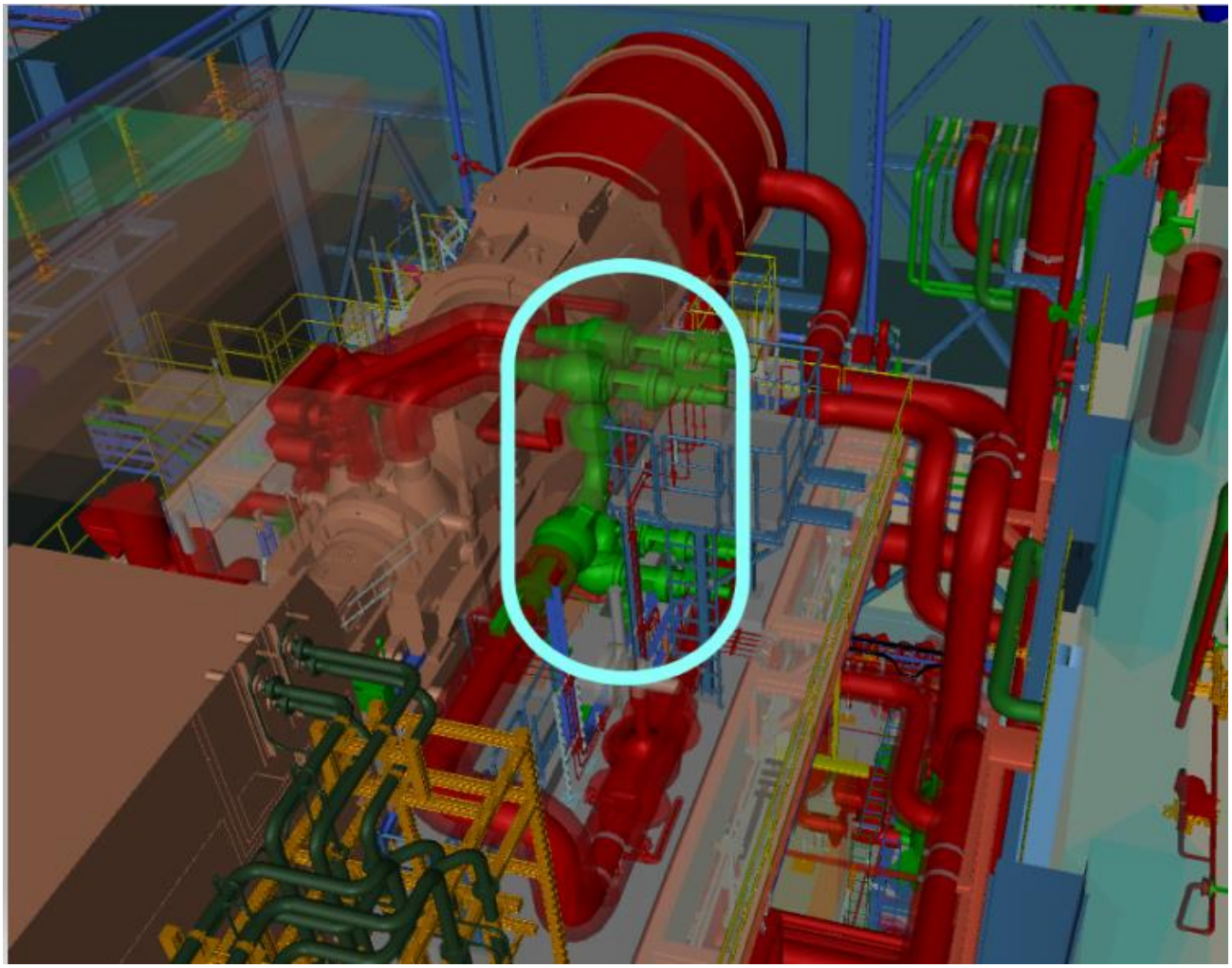
3.3.3 Whether the steam is fed into the turbine or recirculated via the bypass valve is controlled by a set of inlet control valves. These inlet control valves determine the amount of steam fed to the turbine and therefore the amount of electricity produced by the EfW plant. These valves are located immediately upstream of (i.e. before) the first stage of turbine rotating blades. The arrangement of the steam turbine inlet control valves, and the location of the mechanical limitation, is shown in Figure 3.2. The valves are likely to have an approximate bore size of 200mm.

3.3.4 The Consented Scheme includes mechanical stops in the actuators for the inlet control valves to ensure the amount of steam sent to the turbine is physically limited such that the turbine can never generate more than 49.9MW of electricity. As described above, any *'residual'* steam which bypasses the turbine is recondensed and recirculated through the boiler.

3.3.5 The Proposed Development seeks permission to remove the mechanical stops from the actuators for the inlet control valves and/or to install inlet control valves with actuators without a mechanical stop, to allow a greater volume of the steam generated by the boiler to be sent to the turbine than would be allowed under the Consented Scheme. The effect of sending more steam into the turbine is that there is more energy available, which equates to greater mechanical power from the turbine and therefore greater electrical power from the generator. This allows the turbine to run more efficiently and generate over 49.9MW of electricity due to the increased volume of steam being fed into the turbine.

3.3.6 No additional throughput and combustion of waste is required to achieve this uplift in generating capacity. The total amount of steam generated by the EfW plant would not change as a result of the Proposed Development. The Proposed Development would result in a change to where that steam is directed, and the volume of steam allowed to go to the turbine.

Figure 3.2: Inlet Control Valve Arrangement



3.3.7 The Applicant has been liaising with the Environment Agency about the Proposed Development. The Environment Agency has agreed in principle that only a minor variation to the environmental permit would be required to cover the Consented Scheme as amended by the Proposed Development. Any necessary variations to environmental permits and/or consents are outside of the scope of the DCO application and will be sought separately, as set out in the **List of Other Consents and Licenses (Doc Ref. 7.4)**.

3.4 Engineering Works

3.4.1 Under Work Option No.1, the removal of the mechanical stops from the inlet control valves would involve an engineering operation resulting in the extension of the generating station capacity to above 50MW. It would require the following steps:

- Shut down the turbine unit for up to two weeks. Waste could continue to be combusted with all steam bypassing the turbine.
- Remove the mechanical limitation in the installed inlet control valve actuators.
- Adapt the control system to operate without the mechanical limitation.
- Recommission the turbine unit with the higher capacity.

3.4.2 Work Option No. 2 would only be carried out if the DCO for the Proposed Development was granted prior to the installation of the inlet control valves with mechanical stops in accordance with the Consented Scheme and before the turbine unit had commenced operation. Therefore, under Work Option No. 2 the following steps would be undertaken:

- The mechanical limitation in the inlet control valve actuators would be removed prior to the installation of the valves. This would either be done in the factory or in the workshop at the Site.
- The inlet control valves (which are not limited through mechanical stops) would be installed in the turbine unit of the EfW plant by qualified engineers.
- The turbine unit would be commissioned with a generating station capacity of above 49.9MW.

3.4.3 Regardless of whether Work Option No. 1 or Work Option No. 2 was carried out, the engineering operation would be carried out within the consented IWMF building. There would be no change to any component of the external appearance of the Consented Scheme, including the height of the consented stack. Additionally, any landscape planting, tree retention or habitat management that forms part of the Consented Scheme remain unaffected and unchanged by the DCO proposals.

3.5 Grid Connection

3.5.1 The Proposed Development requires a connection to the Local Distribution Network to provide electricity back into the UK power network. As set out in ES Chapter 2, a 132kV grid connection is being implemented to connect the IWMF to the existing UKPN substation at Braintree for connection to the Local Distribution Network. The connection will run along the access road from the IWMF Site as far as Ash Lane and then the route follows various minor roads to the Braintree substation. This is unchanged by the Proposed Development as there is sufficient capacity in this connection to support the increase in electrical output.

3.6 Appearance

3.6.1 The Proposed Development solely comprises an upgrade to internal machinery associated with the EfW plant. As such, it does not necessitate any changes to the external massing or structure of the façade of the Consented Scheme (see **ES Volume 1, Chapter 2: Existing Site Conditions and Consented Scheme (Doc Ref. 6.1)**).

3.7 Waste Inputs, Processing and Residues

3.7.1 No changes to the quantity of the waste being received by the IWMF (i.e. waste inputs), the processing of the waste, nor to the residues from the operation of the IWMF would occur due to the Proposed Development (see **ES Volume 1, Chapter 2: Existing Site Conditions and Consented Scheme (Doc Ref. 6.1)**).

3.8 Water Management

3.8.1 The Proposed Development would utilise the same cooling tower and associated pumps as the Consented Scheme. Water demand and usage would be unchanged to the Consented Scheme (see **ES Volume 1, Chapter 2: Existing Site Conditions and Consented Scheme (Doc Ref. 6.1)**)

3.9 Landscaping

3.9.1 With the Proposed Development solely comprising internal works, there are no changes proposed to the external landscaping scheme defined for the Consented Scheme (see **ES Volume 1, Chapter 2: Existing Site Conditions and Consented Scheme (Doc Ref. 6.1)**).

3.10 Drainage

3.10.1 The Proposed Development has no impact on the consented drainage strategy, with no material impact on water demand and outputs. The lagoons and other aspects of the drainage strategy remain unchanged to that defined by the Consented Scheme (see **ES Volume 1, Chapter 2: Existing Site Conditions and Consented Scheme (Doc Ref. 6.1)**).

3.11 Access and Parking

3.11.1 Operational access and egress would be as per the Consented Scheme (i.e. via the existing Bradwell Quarry access onto the A120). As there are no changes to the quantum of waste input to the IWMF being proposed, the Proposed Development does not necessitate a change to the site access or parking requirements (see **ES Volume 1, Chapter 2: Existing Site Conditions and Consented Scheme (Doc Ref. 6.1)**).

3.12 Traffic Movements and Hours of Operation

3.12.1 There would be no change to the consented hours of operation, or the permitted number of vehicle movements associated with the construction or operation of the Proposed Development to that permitted under the Consented Scheme (see **ES Volume 1, Chapter 2: Existing Site Conditions and Consented Scheme (Doc Ref. 6.1)**).

3.13 Construction

Construction Programme

3.13.1 The selection of Work Option No. 1 or Work Option No. 2 would be dependent on the timing of the DCO. If the DCO were to be granted prior to circa July 2024, Work Option No. 2 would be implemented. Otherwise, Work Option No. 1 would be implemented. If the DCO were to be granted before circa November 2025, this

would be before the turbine was operational and so the first step set out in Paragraph 3.4.1 for Work Option No. 1 would not be necessary.

3.13.2 At this stage, construction works associated with integrating the Proposed Development into the Consented Scheme are expected to take approximately one to two weeks to complete.

Construction Environmental Management

3.13.3 The Applicant has committed to undertaking construction works in line with industry best practice standards as a means of avoiding, reducing or mitigating potential adverse effects of construction on the environment and local community. Where there are controls on construction activities set out in conditions attached to the planning permission for the Consented Scheme, these will be adhered to and replicated in the DCO.

3.14 Operational Activities

3.14.1 The EfW plant, once amended through the Proposed Development, would utilise the same waste types and throughput approved for the Consented Scheme. It is envisaged that the operation would be a continuous process unchanged from the Consented Scheme, operating twenty-four hours per day, seven days per week, with permitted hours for the receipt of incoming waste and departure of outgoing recyclate, composted materials, ash and residues in line with those stipulated by Condition 3 of the planning permission for the Consented Scheme as follows:

- 404 HGV movements (202 in and 202 out) per day (Monday to Friday);
- 202 HGV movements (101 in and 101 out) per day (Saturdays); and
- no movements on Sundays, Public or Bank Holidays, except for clearances from Household Waste Recycling Centres between 10:00 and 16:00 hours as required by the Waste Disposal Authority and previously approved in writing by the Waste Planning Authority.

3.14.2 Once operational, the Proposed Development would not result in a change in staffing demand for operation and monitoring relative to that required for the operation of this element of the Consented Scheme. Any relevant controls associated with the operational activities of the Consented Scheme will be replicated by the DCO.

3.15 Decommissioning

3.15.1 At the end of its operating life, the most likely scenario is that the plant and all equipment would be shut down and removed from the Site.

3.15.2 Prior to removing the plant and equipment, all residues and operating chemicals would be cleaned out from the plant and disposed of in an appropriate manner. The amount of such chemicals would be restricted to the normal plant residues and any remaining operating chemicals. The bulk of the plant and equipment is likely to have some limited residual value as scrap or recyclable materials.

3.15.3 Once the plant and equipment have been removed to ground level, it is expected that the hardstanding and sealed concrete areas would be left in place. Any areas of the plant which are below ground level are likely to be backfilled to ground level to leave a levelled area. It is considered highly unlikely that the Proposed Development would create any new areas of ground contamination.

3.15.4 The planning permission for the Consented Scheme does not contain any controls on decommissioning.

3.15.5 An environmental permit has been approved for the Consented Scheme. Some decommissioning activities for the Consented Scheme are subject to regulatory control through the Environmental Permit which requires the operator to prepare and comply with a Closure Plan. The Closure Plan will be prepared after the EfW plant has been commissioned in line with the following general requirements:

- underground tanks and pipework to be avoided except for supply and discharge utilities such as towns water, sewerage lines and gas supply;
- safe removal of all chemical and hazardous materials;
- adequate provision for drainage, vessel cleaning and dismantling of pipework;
- disassembly and containment procedures for insulation, materials handling equipment, material extraction equipment, fabric filters and other filtration equipment without significant leakage, spillage, dust or hazard;
- the use of recyclable materials where possible;
- methodology for the removal/decommissioning of components and structures to minimise the exposure of noise, disturbance, dust and odours and for the protection of surface and groundwater; and
- soil sampling and testing of sensitive areas to ensure the minimum disturbance (sensitive areas to be selected with reference to the site condition report).

3.15.6 The proposed minor variation to the environmental permit to be sought as a result of the Proposed Development will not amend the controls on decommissioning that would apply to the Consented Scheme. This will be sought outside of the scope of the DCO.

References

[1] HMSO, (1990). Town and Country Planning Act 1990. United Kingdom: Central Government.