2 Site Description and Proposed Development

2.1 Introduction

2.1.1 This chapter provides a description of the project and forms the basis for the environmental assessment provided in this Environmental Statement (ES). Further information can be found in the appendices to this chapter provided in Volume 3 of the ES.

2.1.2 The effects of the project have been assessed throughout the ES based on what is likely to occur. For example, construction information is presented as the 'likely case'. A number of measures which would reduce or avoid adverse environmental effects arising have been included as part of the project design. Details of these measures are provided in this chapter and set out in each subsequent topic chapter. This chapter, together with the topic chapters, provide the data required to identify and assess the main and likely significant effects of the project in accordance with Regulation 18 and Schedule 4 of the EIA Regulations.

2.1.3 This chapter provides a description of the site and the key components of the project, including an overview of the approach to construction.

2.2 The Site and Surrounding Area

Location

2.2.1 The site is located at the former Wealden Brickworks site off Langhurstwood Road, approximately 900 metres to the north west of Horsham and 1.3 km to the north east of the centre of Warnham. The site lies within the administrative areas of West Sussex County Council and Horsham District Council.

2.2.2 The site location is shown on Figure 1.1, with the site boundary shown on Figure 1.2.

Site Description

2.2.3 The site, as defined by the site boundary, comprises approximately 3.8 hectares (ha) of land within the former Warnham and Wealden Brickworks site, a 24.4 ha site. The planning application boundary includes the proposed access route up to the adopted highway. The site includes a large warehouse building currently in use as a Waste Transfer Station/Materials Recycling Facility, surrounded by hardstanding and several smaller buildings.

2.2.4 The site, based upon its former use as a brickworks, is classified as a brownfield site in the West Sussex Waste Local Plan (West Sussex County Council and South Downs National Park Authority, 2014) and is one of five sites allocated for strategic waste management uses.

Topography

2.2.5 The site is relatively flat and falls from 51.30 metres Above Ordnance Datum (AOD) within the north east corner to 47.50 metres AOD within the south west corner. The surrounding topography is gently rolling, which, together with existing woodland and trees means that the site is well screened from the surrounding areas.

Surrounding Land Uses

2.2.6 The southern boundary of the site is defined by the internal access road, beyond which lies the Weinerberger brickworks factory (also known as Warnham Brickworks). The London-Horsham railway line lies immediately to the west of the site, beyond which there are mature tree belts and open countryside.

2.2.7 The eastern boundary of the site is defined by an internal access road, beyond which lies the Brookhurst Wood Mechanical and Biological Treatment (MBT) Facility, which is operated by Biffa in partnership with West Sussex County Council. The MBT Facility commenced receiving waste in 2014 and covers approximately 5.6 ha of land. To the north of the MBT Facility lies an ecological habitat area, which has been established in accordance with Condition 8 of the planning permission for the MBT Facility.

2.2.8 Two ponds are located within dense scrub to the immediate north of the site, surrounded by grey willow, hawthorn and blackthorn.

2.2.9 The land to the immediate north and beyond the ponds is currently vacant and comprises several derelict former brickworks buildings. A planning application (reference WSCC/080/13/NH) was submitted in 2013 for the construction of a new facility for the compaction and baling of Refuse Derived Fuel (RDF). At the time of writing this ES, the planning application for the proposed facility is undetermined.

2.2.10 Approximately 315 metres to the north of the site boundary is located an Aggregate Treatment and Recycling Facility (ATRF). Further north and east of the ATRF is the active Brookhurst Wood Landfill Site, which covers an area of approximately 34 ha. The landfill had planning permission to receive waste until the end of 2016. However, a further planning application to extend the end date for landfilling by 24 months to December 2018, as well as to extend the date for completion of restoration of the landfill from December 2017 until December 2023 has been approved. A leachate treatment plant and gas management compound, site office, store and car park is located between the ATRF and the landfill.

2.2.11 Further details on the allocation of the site in the Waste Local Plan and the relevant planning history of the site are provided in the Planning Statement, which accompanies the application.

Access and Rights of Way

2.2.12 Access to the site is via a private shared estate road, which connects to the public highway at Langhurstwood Road. Langhurstwood Road links directly to the A264 some 750 metres to the south. The A264 links to the A24 and the M23 after a short distance.

2.2.13 This internal access road also serves the Brookhurst Wood Landfill Site, the Weinerberger brickworks factory and the MBT Facility. It will also serve the proposed facility for the management of RDF, if approved. The internal access road has a 10 mile per hour (mph) speed limit.

2.2.14 There are no public rights of way located within the site.

2.2.15 Further details regarding the proposed site access and details of traffic movements on the public highway are provided in Chapter 6: Traffic and Transport.

Towns and Villages

2.2.16 The site lies approximately 900 metres to the north west of the edge of Horsham. According to the 2011 Census, Horsham town has a population of approximately 49,000 residents.

2.2.17 The land to the north of Horsham is allocated as a major strategic development site in the adopted Horsham District Planning Framework (Horsham District Council, 2015), which post-dates the West Sussex Waste Local Plan 2014.

2.2.18 This urban expansion extends from the land to the east of Langhurstwood Road, north of the A264 between Langhurstwood Road and Wimland Road. The development will include around 2,500 homes, a business park, two primary schools, a retail centre, commercial leisure facilities and a wide range of community facilities. The outline planning application for the land to the north of Horsham was subject to a resolution to grant planning consent (subject to a legal agreement) in 2017.

2.2.19 The site lies approximately 1.3 km to the north east of the centre of Warnham. According to the Warnham Parish Plan (Warnham Parish Plan Steering Group, 2007), Warnham has a population of approximately 1,100 residents.

Residential Properties

2.2.20 There are no residential receptors within the site. Residential properties in closest proximity to the site include:

- Langhurst Moat Cottage and Wealden, Langhurstwood Road lie approximately 210 metres south east of the site and several residential properties on Langhurstwood Road, lie approximately 370 metres south east of the site.
- Grayland's Lodge, on Langhurstwood Road, lies approximately 330 metres to the north east of the site;
- Residential properties on Station Road lie approximately 330 metres south of the site;
- Cox Farm lies approximate 420 metres north west of the site; and
- A proposed residential development at North Horsham lies approximately 450 metres south east of the site.

2.3 Overview of the Proposed Development

2.3.1 The proposed development would comprise a Recycling, Recovery and Renewable Energy (3Rs) Facility to sort, separate and process up to 230,000 tonnes per annum of residual commercial and industrial ("C&I") waste and/or residual municipal solid waste ("MSW").

2.3.2 The processing of waste by the proposed development would generate an estimated 21 megawatts (MW) of electricity per annum. Of this, approximately 18 MW would be available for export to the national grid, with the remainder used by the facility itself. The proposed development would also be capable of supplying heat to suitable external users, subject to a heating network becoming available. The quantity of heat available would depend on the network configuration and the demand.

2.4 Facility Process and Operations

Overview

2.4.1 The 3Rs Facility is designed to accept residual waste streams, which, in the absence of the facility, are likely to be disposed of to landfill, or exported for treatment in similar facilities elsewhere. The facility would comprise a mechanical sorting facility in which inert materials and potentially recyclable materials are extracted, followed by energy recovery of the residual stream where the energy content of the remaining waste stream would be recovered.

2.4.2 The facility would be licensed to accept non-hazardous commercial and industrial wastes but also municipal solid waste should it become available.

2.4.3 A small amount of the electricity would be used to drive the plant itself and the balance would be exported from the facility to the local distribution network in the form of electricity. The turbine would be configured to be able to export heat as well, but until a distributed energy network is available, it would operate in electricity generation mode.

Waste Acceptance and Handling

2.4.4 Acceptable waste would arrive at the facility and be delivered to the reception hall and materials pre-treatment area for sorting and recovery of the fractions that can be recovered and recycled. These would be inert materials, wood, selected plastics, ferrous metals and non-ferrous metals.

2.4.5 Acceptable waste would be delivered to the facility in covered vehicles or containers. A vehicle entering the site would be received at the weighbridge, where it would be checked to ensure that it holds a Waste Carriers Licence and that the (electronic) Transfer Note is in order. It would then be weighed to Trading Standards requirements, following which it would be allowed to proceed to the reception hall under the control of a traffic light system to maintain safety of the operation. The traffic light system would direct the vehicle into the enclosed hall where it would be directed to a designated unloading bay and its load discharged into the waste processing hall. Loads that are not carrying recyclable material may unload directly into the bunker.

2.4.6 Waste deliveries would only be accepted from authorised carriers and all heavy goods vehicles entering the site would report to the weighbridge gatehouse before being allowed to enter the site. Details of all waste entering the facility would be recorded in a tracking system. In addition, frequent inspections of waste would be undertaken in the reception hall and any non-compliant waste would be quarantined in a contained service area where it would remain until alternative disposal arrangements are in place.

2.4.7 Having been processed by the mechanical pre-treatment plant in the waste processing hall, the feedstock would be deposited in the bunker. Within the bunker, the feedstock would be mixed using a crane grab to create a homogenous waste profile. Mixing would be part of the bunker management to achieve, as far as possible, uniformity in the waste calorific value to aid the combustion process. The waste bunker would have sufficient capacity to store up to three days of feedstock in order to take into account potential interruptions in waste deliveries.

2.4.8 In order to limit environmental nuisances such as vermin, dust, litter and odour all deliveries, handling and storage would be undertaken in a fully closed environment. Access to and from the reception hall and bunker for waste delivery would be via an entrance fitted with a fast acting door which would remain closed during non-delivery periods.

2.4.9 Periodic washing would also be carried out to maintain a clean tipping area.

2.4.10 The reception area and handling equipment would also be designed to allow the facility to operate as a Waste Transfer Station in the event of extended maintenance periods or shutdowns. This would be achieved by enabling the bunker waste to be back-loaded into articulated vehicles.

Waste Processing and Feedstock Preparation

2.4.11 Acceptable waste would be loaded from the storage area in the waste processing hall into a receiving hopper in the waste processing hall by crane for subsequent processing by the mechanical pre-treatment equipment. The following typical process would then take place:

- The waste would be fed from the receiving hopper into a coarse shredder;
- The shredded material would be passed through a trommel or screen to remove fines;
- The oversize material would pass under over-band magnets to recover ferrous metals and an eddy-current separator to remove non-ferrous metals;
- An air separator would segregate heavy and light fractions;

- Near-infrared detection and sorting units would remove PVC and other plastics as required; and
- The material would then pass through a secondary shredder with capability to reduce the particle size down to a minimum of 75 mm.

2.4.12 The residual waste, known as feedstock, would then be moved to the bunker awaiting thermal treatment.

Thermal Treatment

2.4.13 The feedstock would be lifted by crane grab from the bunker into a feed hopper and fed onto a moving grate. The furnace in which the grate is located would be at a temperature in excess of 850 ºC. Air would be fed through the grate from the underside to maintain the combustion process. The grate would be inclined and the grate-bars would move relative to one another. The movement of the grate would cause the feedstock to tumble slowly down the grate, exposing the feedstock to the air and ensuring almost complete burnout of the carbon in the feedstock. The process would be continuous.

2.4.14 Ash (known as Incinerator Bottom Ash or IBA) would fall through the grate and would contain less than 3% carbon. The ash would be recovered through a water bath (for cooling) and removed to a storage area. The ash would then be moved off-site for conversion into an aggregate substitute and recycled.

2.4.15 The hot gases (known as flue gas) from the combustion of the feedstock would pass through a water-tube boiler. The water in the boiler tubes would turn to steam and the steam would be superheated to approximately 430 ºC at a pressure of between 60 – 72 bar (depending on the final design). The superheated steam would then be passed into a steam turbine that expands the steam, causing it to rotate and drive an electrical generator. Tappings would be included in the turbine casing to allow steam extraction in the event a distributed energy network is fitted. Initially, however, these tappings would be blanked off.

Electricity Generation and Parasitic Load

2.4.16 The superheated steam would pass through the turbine and pass under vacuum to an air-cooled condenser (ACC). The ACC would comprise fans blowing air across a radiator-like tube surface with the low pressure steam passing into the tubes. The cooling of the air would condense the steam back to water, following which it would flow to the feedwater tank and be pumped around the boiler circuit again. There would be no discharge of process water into local watercourses.

2.4.17 The turbine-generator would produce approximately 21 MW of electricity. A proportion of this electricity generated would be used by the facility itself to power the on-site consumers, such as electric motors, fans, lighting, HVAC etc. This is known as the parasitic load.

2.4.18 The efficiency of the facility determines the remaining energy available for export. It is not possible at this stage to state what the exact efficiency would be, but it would be more than sufficient to meet the energy efficiency requirement for a recovery facility of 0.65 set out in the Waste Framework Directive (2008/98/EC). In consequence the facility would qualify as "recovery" under Article 3 of the Directive.

2.4.19 The operator would be required by the Environment Agency under the permitting process to minimise the electricity required to operate the facility so as to optimise the amount of energy that is available for export outside of the operation of the plant itself.

Flue Gas Treatment

2.4.20 The flue gas produced by the combustion process would contain mostly carbon dioxide and water, but would produce some nitrogen oxide (NO_x) and trace quantities of pollutants, depending on the composition of the feedstock being combusted.

2.4.21 NO_x is a naturally occurring product of any combustion process. The means of treating it would have to be approved by the Environment Agency, but it is anticipated that selective non-catalytic reduction would be

used. This would be achieved by the injection of ammonia or urea into the raw gas stream. In the case of urea, it would convert to ammonia and in both cases the ammonia would react with the flue gas stream at a location where the temperature is around 850-900 ºC.

2.4.22 Lime and powdered activated carbon would be injected into the gas stream in the flue gas treatment system, which would be deposited on the filters in the downstream bag filter system. The lime would neutralise any acid gases in the flue gas and the powdered activated carbon would attach to organic compounds (including dioxins) and be removed by the filters. The use of dry lime would enable greater energy efficiency to be achieved and reduces the incidence of plumes at the stack exit.

2.4.23 A baghouse filter would be included as the last process prior to the stack. The baghouse filter would consist of hundreds of individual filter bags and would capture particulate in the gas stream, including dust, lime powder and powdered activated carbon. The filters would be vibrated periodically by "rappers", causing the dust to fall off and be captured and placed in a silo. This material is known as air pollution control residue, and is categorised as hazardous due to its alkalinity, but represents only about 3% by weight of the original raw waste input. The air pollution control residue would be emptied from the storage silo by vacuum tanker and removed off-site for further processing. Processes are available that allows the air pollution control residue to be recycled.

Flue Stack

2.4.24 The facility would have a single flue stack with a proposed height of 95 metres located to the east of the main buildings. The height has been determined through computer dispersion modelling of emissions and evaluation of the resulting dispersion plumes so that ground level concentrations of key pollutants are kept well within acceptable levels under all operating conditions (See Appendix 7.2).

2.4.25 Dispersion of pollutants is dependent on a number of factors including local land topography, emission rates and pollutant concentrations and the height of the facility buildings. The air quality and plume dispersion modelling used to identify the stack height necessary for optimum dispersion is described in detail in Chapter 7: Air Quality and Odour.

2.4.26 The stack has been designed to meet all predicted climatic conditions. A separate windshield has been avoided, thereby minimising visual impact. Continuous emissions monitoring would be included in the stack with 100% redundancy so that in the event of a breakdown the standby equipment would continue to monitor the emissions. The sampling would be brought down to a low level, hence avoiding the necessity for galleries around the stack at height and enabling it to have a smooth profile. The outer surfaces of the stack would be grey-coloured and non-reflective, further minimising visual effects.

2.4.27 The applicant has undertaken consultation with the Aerodrome Safeguarding representatives for Gatwick Airport. This consultation has confirmed that, as the building and stack height proposed are under the Outer Horizontal Surface level, which lies at 204.35 metres AOD, there would be no infringement of this surface and no impact with regard to radar or navigational aids. It was, however recommended that medium intensity red steady obstacle lights be placed around 1.5 metres from the top of the stack to ensure that the stack is clearly visible to helicopters and other aviation traffic at all times. The recommended obstacle lighting is therefore included within the design.

Residues Management

Incinerator Bottom Ash (IBA)

2.4.28 The primary residual material from the combustion process is IBA, which consists of the non-combustible fractions of the feedstock. IBA is continually discharged from the combustion chamber. The volume of IBA generated would be dependent on the composition of the feedstock processed. However, it is estimated that the yearly quantity of IBA generated at the proposed facility would be approximately 40,000 tonnes.

2.4.29 IBA from the furnace would be quenched with water prior to transfer to the bottom ash area bunker. This process would involve the use of a drag conveyor to recover the IBA to a water bath before final transfer to the ash bunker. Storage for approximately four days of IBA has been provided. The Environmental Services Association (ESA) protocol for IBA agreed with the Environment Agency would be followed. This would lead to the IBA being categorised as non-hazardous and capable of being recycled into an aggregate substitute.

2.4.30 Due to the mechanical pre-treatment plant in the waste processing hall, the incidence of metals in the feedstock would be small. Any metals finding their way into the feedstock, however, may be recovered from the ash during its subsequent processing. It is also possible that a metal separator (over-band rotating magnet), located on the last conveyor before the bottom ash bunker, would remove ferrous metal and transfer it to a separate compartment of the ash bunker for storage pending off site transport.

2.4.31 Transfer of IBA from the bunker to collection trucks would be either by crane and hydraulic grab or by front-end loader. The transfer would take place in an enclosed loading bay in order to limit fugitive emissions. All trucks leaving the facility would be securely covered.

Boiler Ash

2.4.32 Boiler ash residues would be removed from the tube surfaces of the boiler by an enclosed conveyor system and transferred to a silo located within the facility. The silo would have the capacity to store approximately ten days of boiler ash residue, and would be transported off site but may be mixed with IBA prior to transport off site, depending on its composition.

Flue Gas Cleaning Residues

2.4.33 Flue gas cleaning residues would be removed from the baghouse filter by an enclosed conveyor system and transferred to two dedicated storage silo located within the facility. The storage silos have the capacity to store approximately seven days of flue gas cleaning residues. The residues would be transported off-site either for recycling or to landfill.

2.5 General Layout

2.5.1 The total site area is 3.8 ha as shown on Figure 1.2. This includes the external site road up to the point at which is connects with the public highway. The proposed development would be contained within the land under the applicant's ownership.

2.5.2 The overall layout of the proposed development is shown on Figure 2.1, with key dimensions shown on Figure 2.2 and in Table 2.1 below. Further details of the dimensions and elevations for the main buildings are provided in Appendix 2.1.

Table 2.1: Approximate Dimensions of Buildings and Structures

Building	Maximum Height (m)	Width (m)	Length (m)	Area (GIA) (m^2)
Waste Processing Hall	12.85	67.50	30.46	1,821
Tipping Hall	12.85	51.87	36.11	1,873
Workshop	13.20	20.51	16.98	348
Bunker	32.43	59.30	24.15	1,432
Offices	13.20	32.00	29.00	448 (per floor x 3)
Control Room	18.69	12.80	8.50	272
Boiler Hall	35.92	29.58	59.43	1,757
Bottom Ash	17.00	11.70	14.85	174
Water Treatment Hall	9.45	17.92	16.52	296
Compressed Air and Electrical	9.45	17.92	13.36	239
Turbine Hall	25.90	24.64	37.17	916
Flue Gas Cleaning	23.00	30.96	10.99	258
Air Cooled Condenser	25.90	33.75	22.30	753
Transformer Enclosure	6.15	18.22	10.25	187
Storage/Recycling Area	8.60	18.74	43.85	822
Gatehouse	4.90	3.91	12.02	44
Flue Stack	95.00	2.5 dia	2.5 dia	n/a
Security Fencing	1.80	n/a	n/a	n/a
Total Gross Internal Area (GIA)				12,536
Total Gross External Area (GEA)				13,160

2.6 Water Usage, Drainage, Treatment and Disposal

Water Usage/Process Waters

2.6.1 The thermal treatment process is designed as a net consumer of water and, therefore, there is no requirement for regular disposal of any waste water from the combustion process. However, waste water would be created from the process in the following areas:

- Water from the boiler drains;
- Back-flushing water from the de-mineralisation plant;
- Ash discharge occasional overflow; and
- De-aerator occasional overflow.

2.6.2 It is also expected that a liquid runoff would result from the normal washdown operation of the tipping hall and bunker areas and from surface water on potentially contaminated areas (roads and hardstanding). This would be routed to a waste water pit designed to allow for the waste water to be recycled within the process. If there is excess process water, it would be tankered off-site.

2.6.3 During construction of the bunker, the integrity of the walls and floor would be verified to ensure water-tightness. Further routine visual checks of the bunker would be undertaken following clearance of wastes to ensure the integrity is maintained.

2.6.4 The operation of the facility would not require discharge of process effluents to watercourses or the foul sewer. The bottom ash quench system would lead to a net use of water within the process.

Site Drainage

2.6.5 Details of the proposed drainage strategy are provided in Appendix 10.4 and Chapter 10: Hydrology and Flood Risk. The details are summarised below.

Surface Water

2.6.6 A drainage strategy has been prepared for the proposed development, which seeks to replicate the existing catchment areas as far as practically possible and also seeks to maintain surface discharge rates and volumes.

2.6.7 The proposed arrangements, which would use existing outfall pipes, are as follows:

- Catchment A: This includes the west and south west external pavements, which would be discharged through a swale prior to discharge into Culvert A (located below the adjacent Network Rail northern line to the west of the site);
- Catchment B: This includes the main building roof, runoff from which would be discharged into Pond B to the north of the site;
- Catchment C: This includes the external pavement areas to the east, which would be drained through a swale prior to discharge into Pond A; and
- Catchment D: This includes the shared access road to the public highway. As the proposed development does not directly pertain to Catchment D; no changes to the existing shared access road drainage are planned as part of this application.

Foul Water

2.6.8 The proposed foul water scheme would address domestic flows from the office and welfare facilities and also include connections from the storage/recycling area, gatehouse and transformer.

2.6.9 Wastewater would discharge to surface water; a Bio-disc package treatment plant has been specified to improve the quality of the effluent prior to discharge via the Catchment A outfall into a tributary of Boldings Brook in line with the current sewage effluent discharge consent.

2.6.10 Based on a population of up to 50 staff per day, the peak rate of foul discharge is estimated at 0.2l/s, with a daily discharge no higher than 2,500 litres per day.

2.7 Waste Types, Inputs, Sources and Facility Outputs

Waste Types

2.7.1 The facility would treat commercial, industrial, household and solid waste and selected combustible waste, complying with the European Waste Codes shown in Table 2.2 below.

Table 2.2: Waste Types to be accepted

Waste code	Description
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing
02 01	wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
02 01 03	plant-tissue waste
02 01 04	waste plastics (except packaging)

Waste code	Description
02 01 10	Waste metal
02 06	wastes from the baking and confectionery industry
02 06 01	materials unsuitable for consumption or processing
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard
03 01	wastes from wood processing and the production of panels and furniture
03 01 01	waste bark and cork
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03	wastes from pulp, paper and cardboard production and processing
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	Wastes from the leather, fur and textile industries
04 02	wastes from the textile industry
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	Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified
15 01	packaging (including separately collected municipal packaging waste)
15 01 01	paper and cardboard packaging
15 01 03	wooden packaging
15 01 04	metallic packaging
15 01 05	composite packaging
15 01 06	mixed packaging
15 01 09	textile packaging
17	Construction and demolition wastes (including excavated soil from contaminated sites)
17 02	wood, glass and plastic
17 02 01	Wood
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 02	wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)
19 02 03	premixed wastes composed only of non-hazardous wastes
19 05	wastes from aerobic treatment of solid wastes
19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable waste
Waste code	Description
19 05 03	off-specification compost
19 06	wastes from anaerobic treatment of waste
19 06 04	digestate from anaerobic treatment of municipal waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01	paper and cardboard
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	Textiles
19 12 10	combustible waste (refuse derived fuel)
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions

Waste code	Description
20 01	separately collected fractions (except 15 01)
20 01 01	paper and cardboard
20 01 10	Clothes
20 01 11	Textiles
20 01 38	wood other than that mentioned in 20 01 37
20 01 39	Plastics
20 02	garden and park wastes (including cemetery waste)
20 02 01	biodegradable waste
20 03	other municipal wastes
20 03 01	mixed municipal waste
20 03 02	waste from markets
15 01 09	textile packaging
17	Construction and demolition wastes (including excavated soil from contaminated sites)
17 02	wood, glass and plastic
17 02 01	Wood
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 02	wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)
19 02 03	premixed wastes composed only of non-hazardous wastes
19 05	wastes from aerobic treatment of solid wastes
19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable waste
19 05 03	off-specification compost
19 06	wastes from anaerobic treatment of waste
19 06 04	digestate from anaerobic treatment of municipal waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01	paper and cardboard
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	Textiles
19 12 10	combustible waste (refuse derived fuel)
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions
Waste code	Description
20 01	separately collected fractions (except 15 01)
20 01 01	paper and cardboard
20 01 10	Clothes
20 01 11	Textiles
20 01 38	wood other than that mentioned in 20 01 37
20 01 39	Plastics
20 02	garden and park wastes (including cemetery waste)
20 02 01	biodegradable waste
20 03	other municipal wastes
20 03 01	mixed municipal waste
20 03 02	waste from markets

Fuel Oil for standby generator	< 0.1% sulphur content

Inputs/Capacity

2.7.2 Overall, the facility would have a capacity to receive 230,000 tonnes of waste per annum. This is the same as is currently approved for the Waste Transfer Station operations.

2.7.3 The thermal treatment plant would have a nominal capacity of 180,000 tonnes per annum.

Waste Sources

2.7.4 It is currently anticipated that all waste arriving at the facility would be primarily from locations within West Sussex, but some may also derive from East Sussex, Surrey and possibly Hampshire.

Other Inputs/Process Consumables

2.7.5 The following chemicals and process consumables would be imported for use by the plant:

- Lime: approximately 4,000 tonnes per annum;
- Activated Carbon: approximately 150 tonnes per annum;
- Hydrochloric Acid: approximately 55,000 litres per annum;
- Caustic Soda: approximately 70,000 litres per annum;
- Fuel Oil: approximately 350,000 litres per annum;
- Ammonia: approximately 400,000 litres per annum (diluted), which may be supplied in the form of urea; and
- Residuals: Outputs.

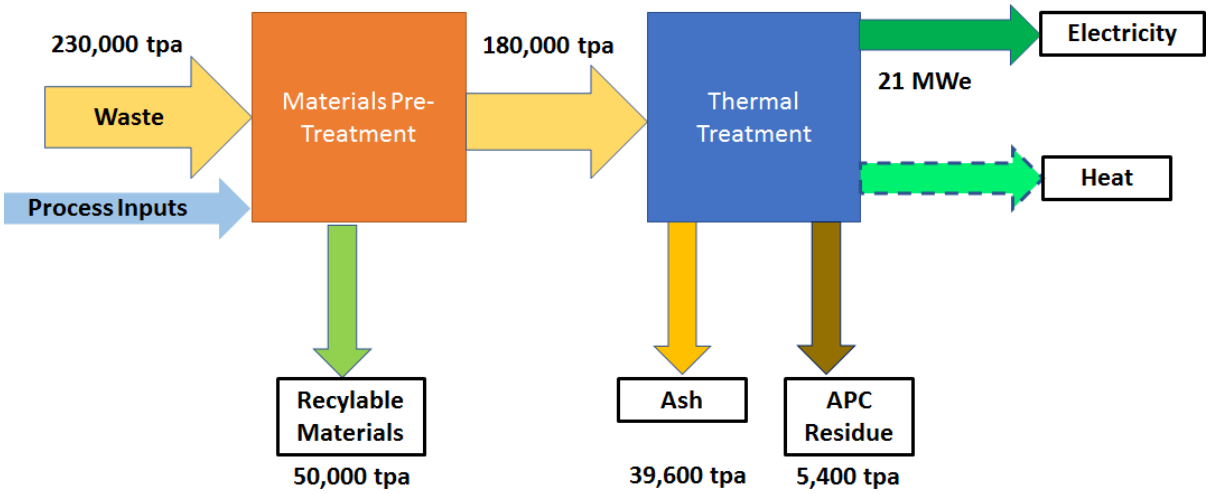
2.7.6 The following outputs would result from the facility:

- Electricity: 21 MW;
- Glass and Inert Aggregates: Approx. 23,500 tonnes per annum;
- Ferrous Metals: Approx. 14,000 tonnes per annum;
- Non-Ferrous Metals: Approx. 5,400 tonnes per annum;
- Air pollution Control Residues (APCr): Approx. 15,000 tonnes per annum; and
- Rejects: Approx. 10,000 tonnes per annum.

Summary

2.7.7 A summary of the materials balance for the facility is provided in Diagram 2.1 below.

Diagram 2.1: Materials Flow Diagram



2.8 Utilities

Mains Water Supply

2.8.1 A potable mains water water supply would be connected to the site. The highest demand would be during the intial fill when the boiler and tanks would be filled. Following that, only make-up water would be required. Arrangements would be made with Southern Water for the supply.

Foul Sewer Connection

2.8.2 An application would be made to the sewerage undertaker for connection to foul sewer. Discharge to sewer would be confined to foul drainage from the on-site amenities (toilets, shower, kitchens etc).

Electrical Power Import/Export Connection

2.8.3 Electrical power would be imported and exported through a connection with the Distribution Network Organisation, UK Power Networks.

2.9 Monitoring

2.9.1 The proposed monitoring arrangements are summarised below. These would be agreed in detail through the Environmental Permitting process administered by the Environment Agency.

Bottom Ash Sampling

2.9.2 Ash samples would be analysed for carbon in ash, heavy metals, dioxins and other prescribed substances with the aim of ensuring that these are at acceptable levels and that the combustion process is operating correctly. Samples would be taken and tested by an independent National Accreditation of Measuring and Sampling (NAMAS) accredited laboratory. The IBA Testing Protocol agreed between the Environment Agency and the Environmental Services Association would be followed and it is expected that the IBA would be deemed non-hazardous.

Flue Gases

2.9.3 The monitoring of exit flue gases would be accomplished through the use of a continuous emissions monitoring system essentially comprising a sample handling system, analyser unit and logging/reporting equipment. These systems use various analytical technologies to determine the gas composition on a continuous basis.

2.9.4 The components measured would, as a minimum, be those stipulated within the Environmental Permit issued by the Environment Agency. The Environment Agency currently states that at least particulate, HCl, SO_2, NO, NO_2, VOC, NH_3, CO and O_2 shall be measured continuously. All the species to be identified and monitored would be specified in the permit and data would be made available to the Environment Agency. The CEMS would have an emergency electrical supply with sufficient capacity to maintain the system for at least 30 minutes in the event of a power failure. All monitoring instruments would be regularly calibrated.

2.9.5 A standby continuous emission monitoring system would also be provided that can be switched into operation on either line in the event of a problem with the duty system or whilst maintenance is taking place.

2.9.6 Dioxin/furan and heavy metal sampling would be undertaken in accordance with the Environmental Permit. The sampling would be carried out by an independent company/laboratory and is expected to be supplemented by tests carried out by the Environment Agency.

Process Control

2.9.7 The processes taking place throughout the plant would be monitored by an integrated computer control system, typically comprising Programmable Logic Controllers (PLC) for the furnace and grate, refuse crane operation, gas cleaning system, bag filter, water treatment plant and turbine generator system. These would be integrated into a distributed control system (DCS) operated from a central control room.

2.10 Access

2.10.1 Access to the facility would be taken from the existing entrance point to the site. All vehicles would proceed to the gatehouse and pass over the weighbridge before proceeding into the site. No vehicles would be permitted onto the operational site without passing over the weighbridge or receiving formal authorisation to bypass it. Vehicles would then circulate around the perimeter of the facility in a one way clockwise system. All waste vehicles would pass over the second weighbridge before exiting the site.

On-Site Circulation and Parking

2.10.2 Staff and visitors would enter the site and turn right before reaching the weighbridge to enter the car park.

2.10.3 All other vehicles would first proceed to the gatehouse where they would pass over the weighbridge before following the route appropriate to their purpose and then pass over a second weighbridge before exiting.

2.10.4 An impermeable surface would provide access for use by Heavy Goods Vehicles (HGVs) around the main building, with a parking area for six HGVs provided to the front of the site. Separate parking is also proposed to the front of the site for 31 cars for staff and visitors (plus two disabled spaces). A coach parking space and a covered bike shelter would also be provided for staff and visitors.

Traffic Management

2.10.5 The capacity of the proposed facility would match the capacity of waste already permitted to be managed at the site, i.e. 230,000 tpa. The facility would not therefore result in any increase in vehicles coming to the site

above those already permitted. There would, therefore, be no requirement for any additional waste related HGV movements to transport waste to the site over and above the sites extant consent.

2.10.6 Total HGV movements at the site would be managed so as to not exceed the numbers permitted by the extant permission. The applicant would be willing to accept a planning condition in this respect.

2.11 External Lighting

2.11.1 Details of the proposed site lighting are provided in Appendix 2.2. Illumination levels would accord with SLL Lighting Guide 1: The Industrial Environment (CIBSE, 2012).

2.11.2 The lighting design has been based on the use of appropriate lighting to provide safe working conditions in all areas of the site, whilst minimising light pollution and the visual effect on the local environment. This would be achieved by the use of luminaries that eliminate the upward escape of light.

2.11.3 Within the internal process areas, outside of normal working hours, operators would be in the control room and thus lighting would generally remain switched off, with the exception of emergency and escape route lighting. The lighting would be controlled with movement detection locally and from the control room and lighting groups would be switched on only as and when necessary.

2.11.4 Lighting would generally be installed along the walkways and stairways around the process equipment to provide illumination for safe access and operational tasks, and at night would only be switched on when operators need access to a specific level.

2.11.5 The waste processing hall and bunker area lighting would be switched on permanently as feeding of waste from the bunker to the hopper is essential for the 24-hour operation of the facility. Maintenance on the pre-treatment plant would be carried out overnight and visual spectrum smoke detection would be used as part of the fire protection. These buildings would be covered with solid cladding, which would minimise fugitive light emissions from this area.

2.11.6 For the administration/visitors' building, lighting would generally be switched off out of normal working hours, unless nightshift operators need specific access to the offices or mess facilities.

2.11.7 A dimmable lighting scheme is proposed to facilitate lower levels of lighting in the evening to suit low level site activity.

2.11.8 Aviation warning lights fitted to the stack and the boiler building would be medium intensity red steady obstacle lights and would be positioned to be visible from the air.

2.12 Appearance and Materials

2.12.1 The facility would include a curved roof, referred to as 'curvilinear', incorporating a large sweeping curve across the facility. The curve would start at the bunker hall, cross the bunker and boiler halls and then cover the air cooled condensers and flue gas treatment area. The purpose of the curve is to visually bring all of the separate elements of the facility together as one structure and to visually reduce the building's height. The design builds on the reduction in height achieved from sinking the building into the ground.

2.12.2 The external colours would also aid the visual reduction in height by having the higher elements in lighter greys with a darker grey plinth at a lower level.

2.12.3 The design has taken into account the "Guidance on the selection and use of colour in development" (High Weald AONB, 2017). The Western High Weald Woodland and Heath Sub Palette has been selected as the

most appropriate for the proposed development. Muted greys, greens and browns are proposed, as described in the Design and Access Statement accompanying the planning application. This would enable the building to be more readily absorbed, in visual terms, into the landscape.

2.13 Landscape Strategy

2.13.1 The landscape proposals (Figure 5.38) are also designed to assist in screening low level clutter, such as vehicles in the car park, giving a simplicity to the front of the facility and providing as much screening of as much 'human-scale' activity as possible.

2.13.2 The planting at the front of the building would be a simple palette of predominantly evergreen trees in hedgerows or ground cover. At the internal roundabout, a line of trees within a curved hedgerow would help to screen direct views along the access road from Langhurstwood Road. Trees and hedgerows would provide a softening element to the building in views from the Biffa waste management facility and the Weinerberger Brickworks. To the north of the facility areas of native woodland containing both evergreen and deciduous species would complement the existing, retained woodland.

2.13.3 The use of a simple wildflower mix would provide an additional ecological habitat within the site.

2.13.4 The landscape proposals are shown on Figure 5.38 of this ES.

2.14 Hours of Operation

Waste Preparation, Processing and Energy Generation

2.14.1 The proposed development would operate 24 hours per day, 7 days a week except during shutdowns for maintenance activities.

Receipt of Waste

2.14.2 The hours for waste delivery would remain the same as those currently approved for the Waste Transfer Station operations i.e. 07:00 to 18:00 on Monday to Saturday

2.14.3 Deliveries/collections would be scheduled to avoid movements on Sundays, Bank Holidays or Public Holidays. With the prior approval of the local planning authority, occasional waste deliveries and/or collections may take place outside these hours to avoid peak hour traffic flows or to prevent waste being stored within vehicles overnight, at weekends or during holiday periods.

Plant Maintenance and Shutdown

2.14.4 Procedures for checking the efficiency and safety of the plant would be applied during commissioning of the plant, at which time it would be fully tested.

2.14.5 Regular maintenance would ensure high performance from the plant. A comprehensive programme of preventative maintenance would be implemented based on modern condition monitoring techniques. A computerised maintenance management system would be deployed with scheduled maintenance routines with appropriate priority on a daily basis. The plant would shut down for maintenance for around two week each year.

Staffing

2.14.6 It is estimated that the operation of the site would be undertaken by up to 50 people. Operational staff would include one site manager, six support staff (weighbridge, administration and security), five shift teams for the energy plant of four persons per team, together with a waste operational team of 14 persons. The five shifts would be needed to cover 24-hour operation, 7 days per week, using a rotating shift pattern and a spare shift to cover holidays and absences.

2.14.7 Maintenance would be covered by two shifts of 12 hours per day with a total complement of six persons.

2.14.8 During the course of any one day the number of people on site would be:

- Site manager: 1;
- Support staff: 6;
- Plant shift operations: 8;
- Maintenance: 6;
- Materials recovery and preparation: 12;
- Total: 32 staff members.

2.15 Resilience of the Design to Climate Change

2.15.1 Regulation 18(3) of the EIA Regulations requires consideration of the vulnerability of the project to climate change.

2.15.2 Resilience to future climate change has been considered during the design process. The design has taken into account, for example, future flood risk and resilience to extreme weather events. The project would be built and designed in accordance with relevant buildings regulations and would therefore be able to withstand climatic changes anticipated to occur within the project's lifetime. This philosophy would provide a significant betterment when considered against the existing drainage system in terms of flow rate and volume.

2.15.3 The proposed drainage strategy would incorporate appropriate measures to manage surface water runoff to greenfield runoff rates using sustainable drainage systems (SuDS) and would take into account the 1 in 100 year risk event, with an allowance for future climate change. Further details of the proposed drainage strategy are provided in Chapter 10 (Hydrology and Flood Risk) and Appendix 10.2 (Flood Risk Assessment).

2.16 Vulnerability to Accidents and Disasters

2.16.1 The EIA Regulations require consideration of the effects on the environment deriving from the vulnerability of the project to risks from major accidents and/or disasters, where these are relevant to the project concerned.

2.16.2 This section considers the potential accidents and disasters that could affect the proposed development or the environment. However, it is stressed that such events are not considered likely.

Substances Used on Site and Storage of Hazardous Materials

2.16.3 A range of chemical substances and some hazardous materials would be stored on site associated with the thermal treatment process, including lime, activated carbon, hydrochloric acid, caustic soda, boiler water treatment chemicals, fuel oil and ammonia or urea. These materials would be stored in accordance with Environment Agency and Health and Safety Executive guidance.

2.16.4 The selective non-catalytic reduction system would use either ammonia or urea as the reagent. The reagent and boiler water treatment chemicals would be stored in suitable containers or if diluted, stainless steel bunded storage tanks provided with a pressure relief valve and vent scrubber system, as appropriate. In the event of a spillage, the bunds would retain the liquid. The drainage from waste storage areas would be routed to the wastewater pit.

2.16.5 Lime and activated carbon would also be used within the flue gas treatment process. Storage would be in dedicated steel silos with equipment for filling from a tanker through a sealed pipe work system. Delivery to the site would be by bulk powder tanker.

2.16.6 Boiler water treatment chemicals would be used to de-mineralise the boiler water and control water hardness, pH and scaling and would be delivered in sealed containers and stored in the water treatment room.

2.16.7 Diesel fuel would be used on site for the auxiliary burners and mobile plant and equipment. The fuel would be stored in an underground storage tank. The auxiliary fuel would only be used to start-up the thermal treatment plant and bring it to temperature prior to injection of feedstock.

2.16.8 There would also be portable bottles of oxygen and acetylene gas stored on site for welding purposes. The gas bottles would be kept secure in a separate compound adjacent to the workshop and only used as necessary.

Hazard Prevention and Environmental Controls

Fire

2.16.9 A Fire Prevention Plan would be submitted to the Environment Agency along with the permit application and insurers would require close scrutiny of fire protection measures. Comprehensive fire protection and detection systems would be installed within the facility to prevent fires occurring. In addition to these systems, standard health and safety procedures would be put in place. These would include measures such as the prohibition of smoking. Flammable liquids and chemicals would be kept in sealed containers/tanks within bunded storage areas.

Accidental Discharges of Water from Circulation System

2.16.10 The facility has been designed as a zero water discharge facility and is set on an impermeable concrete mat. Therefore, no spillages or accidental discharges from the plant are anticipated. However, in the event of such an incident occurring, contaminated water would be diverted to a wastewater pit where it can be held and either reused in the process, treated and discharged to the sewer under a discharge consent or tankered off site for disposal if necessary.

Spillages of Additives

2.16.11 Liquid additives and chemicals would be stored in sealed tanks within bunded storage areas or equivalent with a capability of containing up to 110% of the capacity of the storage tank. Additives including lime and activated carbon would be fed into the process automatically and there should be no requirement for human intervention in this process. The delivery of all additives would follow standard health and safety and Control

of Substances Hazardous to Health (COSHH) procedures. In the event of a spillage, the bunds would retain all liquids, these will then be pumped into tankers and removed from the site.

Emissions to Air, Odour and Dust Suppression

2.16.12 The potential impacts of the facility's emissions to the atmosphere are discussed in detail in Chapter 7: Air Quality and Odour.

2.16.13 Odour, dust and other environmental effects from the facility would be controlled in accordance with the requirements of the Environment Agency guidance.

2.16.14 Air from the reception hall has the potential to be odorous because of the presence of raw waste. However, containment of dust and odour within this area would be achieved through the maintenance of negative pressure in the hall with odours drawn into the thermal treatment plant and destroyed.

2.16.15 To achieve this, combustion air fans would draw feed air for the combustion process from the waste reception hall into the furnace to feed the combustion process. As a result, any dust or odour from the tipping, mixing, shredding and furnace loading operations would be retained within the waste reception hall or drawn into the furnace where the odour-carrying gases would be destroyed by combustion, virtually eliminating the possibility of odour detection outside the facility.

2.16.16 Doors would be fitted with automatic door closures, where required.

Vermin Control

2.16.17 The main area where vermin could potentially be attracted is the tipping and bunker hall. Waste would not be allowed to accumulate within the tipping hall and the floors would be kept clean through the use of loaders which would collect any spilled waste and deposit it into the waste bunker. In addition to these measures, standard pest control methods would be implemented as part of the Environment Agency permitting procedures.

Plant Maintenance and Shutdown

2.16.18 Regular maintenance of the facility would be carried out on a daily basis by a permanent team of qualified maintenance engineers. Most maintenance work would be carried out during normal daytime working hours and would conform to a planned maintenance program. For approximately two weeks per year the thermal treatment plant would need to be shutdown and allowed to cool to allow personnel access for maintenance and repair, particularly to the furnace and boiler. Every ten years or so it may be necessary to carry out an extended outage to maintain the steam turbine. All maintenance would be carried out to written procedures and recorded in the CMMS. A stock of spares would be held in store within the facility for a rapid replacement of parts that wear out or fail.

Abnormal Operating Conditions

Start Up

2.16.19 This would take place during commissioning of the facility and after each maintenance shutdown period. Prior to start up all systems and equipment would be checked to ensure they are ready for use. Prior to combustion, auxiliary burners would be used to bring the furnace up to its minimum operating temperature where the combustion gases are at least 850 ºC. It would also be necessary for the flue gas treatment system to be brought up to its operating temperature before it would be fully effective. Once the appropriate temperatures have been achieved, the feed hopper and grate would be activated and waste fed into the furnace.

2.16.20 Generation of electricity can only begin when sufficient steam at the correct pressure and temperature has been produced. There would be a period of delay between start up and the export of electricity to the local public electricity supply network. During this period the plant would import electrical power through the same cables that are used for export of generated power.

Fire Protection

2.16.21 The facility would be equipped with a comprehensive fire protection and detection system and would conform to the required health and safety regulations including procedures in the event of a fire.

2.16.22 In the bunker hall, remotely operated water cannons would be installed, which are capable of covering the entire bunker and feed hoppers. Both an electrical fire pump and a reciprocating engine-driven fire pump would ensure that fire systems are available at all times. The operation of the fire pump would set off an audible alarm in the control room. The firewater tank would be sufficient to provide enough water for at least 2 hour's capacity of the pump, giving time for the emergency services to respond.

2.16.23 Fire detection and protection systems would be installed in other areas of the plant, the type of which would be dependent on the nature of the process(es) taking place in any given location. Smoke extractors would also be fitted in the boiler house. Fire detection and protection systems would be installed in all electrical and instrument rooms, and would be tested to current standards.

Failure of a Bag Filter

2.16.24 Failure of a filter bag is an irregular event, which would be detected by monitoring equipment, which sends a warning to the operators in the control room. The failed bag filter would be located by a loss of pressure across the filter bag and the faulty bag isolated, and the bag replaced either on-line or during an outage. Individual bag failure would not result in an exceedance of the Environmental Permit limits.

Failure of FGT Equipment

2.16.25 There are various standby items, which can readily be installed to enable the plant to remain operational. If a lime injection system failure were to occur then unspent lime on the filer bags would ensure that the combustion conditions and emissions comply with the Environmental Permit during an emergency shutdown.

Failure of Other Equipment

2.16.26 The plant would be designed with stand-by systems and redundancy in equipment and this, together with a comprehensive planned maintenance programme to ensure the plant remains operational and in compliance with the Environmental Permit.

Electrical Failure

2.16.27 In the event of a failure of the power supply connection to the local public supply network, the facility would operate in island mode, during which the turbine generator would directly supply the required power to sustain operation of the facility until the supply connection is restored. In the event that operation in island mode is not possible, the facility would switch to an uninterruptible power supply and import power from the power supply network, allowing the facility to maintain all critical systems. Under these conditions, a controlled safe shut down of the facility would be initiated. During this period, all emissions would be monitored and kept within the permitted limits.

Emergency Shutdown

2.16.28 If any incident endangers or is likely to endanger personnel, or there is a risk of serious damage to the facility, an emergency shutdown would be necessary. Prior to the plant becoming operational, precise operating

procedures for the various possible scenarios according to the likelihood of incidents in the facility, taking into account the safety of personnel and the equipment would be in place.

2.16.29 In order to rapidly extinguish combustion in an emergency, an emergency shutdown would be initiated or the induced draft fan would be switched off. This would result in the immediate stopping of the combustion air fan, the grate feed and the burner. Staff would ensure that the above actions have been completed, and that the fan intake louvres and dampers are closed (to prevent any natural draught which could leave a fire smouldering on the grate), the air dampers under the grate are closed, and the burner fuel oil safety valves are closed.

2.17 Construction

Construction Programme

2.17.1 It is anticipated that construction of the proposed facility would commence within three years of being granted planning permission, depending upon financing and procurement lead times. The construction of the proposed development is estimated to take approximately 34 months, including commissioning and testing. A provisional schedule is outlined below:

Phase 1 – Site Preparation

2.17.2 The first phase would comprise site preparation and construction of the site roads to sub-base level, main drainage runs, temporary car parking and staff facilities. Site preparation works would include site clearance, fencing, bulk excavation, regrading, advance landscape berming and planting. It is estimated that Phase 1 would take approximately 2 to 3 months.

Phase 2 – Construction Works

2.17.3 The second phase would comprise the construction works and installation of major process plant. Construction works would include the construction of buildings, roads completion, drainage and infrastructural works completion. Subject to lead times for plant delivery, the duration of Phase 2 is estimated at approximately 23 months.

Phase 3 – M&E and Final Works

2.17.4 The third phase would comprise ongoing installation and testing of mechanical and electrical equipment and any final completion and finishing works. The duration of Phase 3 is estimated at approximately 8 months.

Commissioning and Testing

2.17.5 Commissioning and testing activities would comprise the certification of various components of the facility by a number of work groups. The commissioning of the facility should be scheduled to begin at least 12 weeks prior to start-up of operations.

Construction Working Hours

2.17.6 Normal hours of working during construction would be:

- Monday to Friday 07.30 to 19.00 hours; and
- Saturday 08.00 to 16.00 hours.

2.17.7 No construction works would take place on Sundays or Public Holidays. In the event that construction would be required outside of these hours consent would be agreed in advance with the local planning authority. Non-intrusive activities (such as electrical installations and commissioning operations etc) would be

undertaken outside of these hours in order to minimise overall construction time. HGV movements associated with such activities would be minimal.

Employment

2.17.8 The level of staff employed during the construction phase would vary throughout the construction period but it is estimated that there would be an average of 50 workers on site at any one time.

2.17.9 The level of work is anticipated to fluctuate over the course of the construction programme but the peak level of workers is likely to be in months 7 to 9 and would peak at around 182 people.

Plant

2.17.10 Plant to be used during the construction phase would typically include:

- Tracked excavators (excavation and loading);
- Articulated dump trucks;
- Wheeled back hoe loaders;
- Wagons;
- Telescopic handlers;
- Rollers;
- Water pumps;
- Concrete pump;
- Generators;
- Cement mixer truck;
- Cranes; and
- Vibratory sheet piling rig(s).

Construction Access

2.17.11 Access during the construction phase would be via the existing site access.

Environmental Management

2.17.12 A site specific Construction Environmental Management Plan (CEMP) will be prepared for the proposed development in consultation with the local planning authority. The CEMP will include all of the construction phase mitigation measures identified in this ES.

2.17.13 The purpose of the CEMP will be to:

- Provide a mechanism to ensure that measures to prevent, reduce and where possible offset potentially adverse construction phase environmental effects identified in the ES are implemented.
- Ensure that good construction practices are adopted and maintained throughout the construction of the proposed development.
- Provide a framework for mitigating unexpected impacts during construction of the proposed development.
- Provide the necessary assurances to third parties that their requirements with respect to environmental performance will be met.

- Provide a mechanism for ensuring compliance with environmental legislation and statutory consents.
- Provide a framework against which to monitor and audit environmental performance.

2.17.14 Depending upon the conditions attached to the planning permission for the proposed development it is proposed that either relevant parts of the CEMP or the whole of the CEMP will be submitted to the local planning authority prior to commencement of works for approval and to demonstrate compliance with any pre-commencement planning condition requirements.

2.17.15 The approved CEMP will be adhered to and implemented throughout the construction period strictly in accordance with the approved details, unless otherwise agreed in writing by the local planning authority.

2.18 Decommissioning

2.18.1 Planning permission is sought for permanent development on the site and therefore it is not considered necessary to consider the effects of the decommissioning phase within this ES.

2.18.2 However, in the event of decommissioning becoming necessary, the techniques followed would be controlled having regard to relevant legislation and good practice guidance at that time and would be subject to a decommissioning environmental management plan.

2.19 Residues and Emissions

2.19.1 The following section provides a summary of estimates, by type and quantity, of expected residues and emissions associated with the proposed development. The basis for these estimates, as well as an assessment of their effects, is discussed in more detail within the topic chapters of this ES. Chapters 6 (Traffic and Transport), 7 (Air Quality and Odour) and 8 (Noise and Vibration) are relevant in this regard.

Construction Phase

Emissions to Air

2.19.2 There is the potential for dust generation during the construction phase due to earthworks, and movements of mobile plant accessing and operating on the site.

2.19.3 Contractors would be required to use good engineering practices and follow good practice guidance to minimise dust emissions during the construction phase.

Traffic

2.19.4 Full details of construction traffic are provided in Chapter 6. Contractors would be required to use good engineering practices and follow good practice guidance to minimise dust emissions during the construction phase.

Noise

2.19.5 Noise emissions are likely to be highest at the early stages of works i.e. during site preparation and civil works, and decrease during the plant erection and fit-out stages. Noise emissions during the fit-out as buildings are completed would be very low as work is undertaken mostly with hand-tools within the completed structures.

2.19.6 For the majority of the construction period, plant on-site would comprise various diesel mechanised construction plant including excavators (with various tool attachments depending upon the task being undertaken), dump trucks, fork-lift trucks, concrete wagons and pumps, mobile cranes and delivery lorries.

2.19.7 It is anticipated that the most noise generating activity on site would be piling of foundations. As building foundation loadings are not high for the majority of the development, the need for driven piling is expected to be limited and alternative methods would be employed where possible.

2.19.8 Details of noise associated with construction traffic are provided in ES Chapter 8: Noise and Vibration.

Vibration

2.19.9 Depending upon the method used, piling has the potential to cause vibration that would be noticeable on-site. However, the propagation of ground-borne vibration is subject to significant losses due to the distances between the site and receptors and the varying densities of the subsurface geology.

Operational Phase

Emissions to Air

2.19.10 The plant would be designed and operated in accordance with the requirements of the Industrial Emissions Directive (2010/75/EU), known as the IED, which requires adherence to emission limits for a range of pollutants. The table below shows the current Industrial Emissions Standards.

2.19.11 More detailed information regarding emissions to air including short- and long-term Waste Incineration Directive (WID) Emission Limits is provided in Chapter 7: Air Quality and Odour and associated appendices.

Table 2.3: Relevant Industrial Emission Directive Limit Values

Pollutant	Scenario 1 Short-Term Emission Limits ($mg.Nm^{-3}$)	Scenario 2 Daily-Mean Emission Limits ($mg.Nm^{-3}$)
Particles	30	10
TOC	20	10
HCl	60	10
HF	4	1
SO_2	200	50
NO_x	400	200
CO	-	50
Group 1 metals [(a)]	-	0.05 [(d)]
Group 2 metals [(b)]	-	0.05 [(d)]
Group 3 metals [(c)]	-	0.5 [(d)]
Dioxins and furans	-	0.0000001 [(e)]

Notes: All concentrations referenced to temperature 273 K, pressure 101.3 kPa, 11% oxygen, dry gas.

(a) Cadmium (Cd) and thallium (Tl).
(b) Mercury (Hg).
(c) Antimony (Sb), arsenic (As), lead (Pb), chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn), nickel (Ni), and vanadium (V).
(d) All average values over a sample period of a minimum of 30 minutes and a maximum of 8 hours.
(e) Average values over a sample period of a minimum of 6 hours and a maximum of 8 hours. The emission limit value refers to the total concentration of dioxins and furans calculated using the concept of toxic equivalence (TEQ).

2.20 Greenhouse Gases/Carbon Footprint

2.20.1 A greenhouse gas assessment of the proposed thermal treatment facility, based on an estimate of its operational carbon footprint has been undertaken and is included at Appendix 2.3. The assessment takes

into account process emissions (considering the scenarios of the facility operating in electricity-only mode and potential combined heat and power (CHP) mode), avoided emissions and vehicle emissions associated with the transportation of waste.

2.20.2 The assessment of the potential carbon footprint for the facility shows that it performs well, providing an estimated reduction in greenhouse gas (GHG) emissions of approximately 242,700 tonnes of CO_2 equivalent per annum operated in electricity-only generation mode, and 310,800 tonnes of CO_2 equivalent per annum if it is able to be extended to run in CHP mode. This saving with electricity generation alone is equivalent to the annual emissions from approximately 39,700 homes.

2.20.3 Emissions savings from avoided landfilling of waste amount to approximately 76,500 t CO_2 equivalent per annum, and further savings of 38,000 t CO_2 equivalent per annum are achieved through recovery and recycling of metals from combustion residue (bottom ash).

2.20.4 Whilst combustion of waste in the thermal treatment facility produces emissions of 51,000 tCO_2 equivalent per annum, these are balanced by emissions savings from displaced electricity generation from the grid mix of mainly conventional power stations of between 69,200 t CO_2 equivalent per annum.

2.20.5 Over the expected lifetime of the proposed facility (assumed to be 25 years) total GHG emissions savings from the thermal treatment facility amount to at least 6.06 million tonnes of CO_2 equivalent compared to the current landfilling of the waste, and over 7 million tonnes of CO_2 equivalent if CHP is developed early in its operational life.

2.20.6 In summary, the proposed facility is anticipated to have a significant positive effect in terms of greenhouse gas emissions within West Sussex compared to the existing commercial and industrial waste management arrangements.

2.21 References

Legislation

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions

The Construction (Design and Management) Regulations 2015 (2015 SI No 51)

The Environmental Permitting (England and Wales) Regulations 2016 (2016 SI No 1154)

Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (2017 SI No. 571)

Publications

CIBSE (2012) LG01 Lighting Guide 01: The Industrial Environment – LG1.

High Weald AONB (2017) High Weald AONB Guidance on the Selection and Use of Colour in Development.

Horsham District Council (2015) Horsham District Planning Framework (excluding South Downs National Park).

Warnham Parish Plan Steering group (2007) Warnham Parish Plan – A Parish Plan for a Planned Parish.

West Sussex County Council and South Downs National Park Authority (2014) West Sussex Waste Local Plan. April 2014.