



Enva E-Waste England Ltd

ENVIRONMENTAL PERMIT APPLICATION

Supporting Report





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WSP

8 First Street

Manchester

M15 4RP

Phone: +44 161 200 5000

WSP.com



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Prepared by	Claudia Lee	Claudia Lee	Claudia Lee
Signature			<i>C.Lee</i>
Checked by	Stuart Clayton	Stuart Clayton	Stuart Clayton
Signature			<i>S.Clayton</i>
Authorised by	Karen Phillipson	Karen Phillipson	Stuart Clayton
Signature			<i>S.Clayton</i>



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1. NON-TECHNICAL SUMMARY

Enva E-Waste England Ltd (hereinafter “Enva”) is the largest corporate Waste Electrical & Electronic Equipment (WEEE) recycling and reuse business in the UK and are proposing to develop a new WEEE recycling facility in Dartford, Kent, to add to their portfolio of locations. The proposed facility will include the development of a new WEEE treatment facility that has the ability to deconstruct Waste Temperature Exchange Equipment (WTEE), consisting of fridges and freezers only, their constituent parts for recycling, alongside the deconstruction of Small Mixed WEEE (SMW) . The development will be very similar in scale and nature to Enva’s Grantham site, which operates under an environmental permit and has done so since 2009, with a recent variation determined in 2024 (reference EPR/CP3899SD/V006).

Comprising of one large unit and associated external storage, the site is proposed to accept WEEE products that include fridges, freezers, cookers and small domestic appliances (SDA) for recycling. In order to process the WTEE, the initial stage involves degassing, which is known as stage 1 pre-destruction. This is followed by stage 2 destruction, entailing shredding and fraction segregation. For recycling of SMW, a manual dismantling process is required and the removal of components that contain hazardous substances, where necessary. Waste SDA then undergo shredding and separation into fractions for recovery.

The capacity of the proposed facility is 35,000 tonnes per annum of WTEE, with a smaller quantity of mixed WEEE waste (SMW) of approximately 40,000 tonnes.

As part of this environmental permit application, the following requirements have been considered:

- **Management systems:** Enva will operate the Dartford facility in accordance with an Environmental Management System (EMS), certified to ISO14001, as other of Enva’s sites are operated. All processes, procedures and management plans will be implemented in line with the EMS to ensure efficient operation. A summary of the EMS and its compliance with GOV.UK guidance is provided later on in this application supporting report.
- **Energy efficiency:** With electricity as the main source of energy for the site, energy use at the facility will be undertaken with the consideration of energy efficiency measures and the appropriate measures that relate to this aspect. Such measures are outlined within this application.
- **Raw materials and water:** Raw materials and fuels to be used at the facility include diesel, nitrogen and lubricating oil . Usage of raw materials is anticipated to be very similar to that at Enva’s Grantham site, due to the similarities in operations and scale. Water usage is expected to be much less at this facility, compared to Grantham, which carries out re-use activities, as well as recycling activities.
- **Waste Management:** Waste streams on site will consist of general mixed waste, metal waste, waste oil and drums/IBCs. All of these will be in relatively small volumes. Residual materials arising from recycling operations will be dispatched to relevant waste treatment facilities.
- **Emissions to air:** At the facility there will be a total of three point source emissions to as part of the recycling processes to be carried out on site. A H1 assessment for emissions to air was undertaken which demonstrated that the emissions were insignificant and required no further modelling.
- **Emissions to water:** Water will not be used within the activities to be carried out on site and so there will be no process effluent. On site drainage will divert surface water run-off into a holding tank via an oil interceptor. From here, the surface water run-off will be discharged to the ponds to the south and southwest of the site, which outfall into the River Thames via existing infrastructure.

- **Emissions to sewer:** There are no emissions to sewer.
- **Emissions of substances not controlled by emissions limits:** Fugitive emissions to water have been considered in relation to sub-surface structures and sumps, site surfacing, bunds / secondary containment and storage areas. All relevant requirements, in line with relevant appropriate measures, are to be implemented for environmental protection. Further to this, airborne dust particles could be released from recycling and loading processes, which has been considered within the design of the facility and the abatement measures that are to be in place as well as within the fugitive emissions management plan.
- **Odour:** The activities to be undertaken at the site are not inherently odorous, due to the types of waste being handled.
- **Noise and vibration:** The potential for noise emissions can be generated from a number of sources on site, including transportation of waste for treatment, but also the treatment processes themselves. The location of the main processing activities within the main building and the installation of a 4-metre-high acoustic fence bounding the site will be key in mitigating the potential for noise pollution.
- **Environmental risk assessment:** A risk assessment has been produced considering the new facility and its associated activities as well as the risk they pose to the environment, covering land and groundwater contamination, odour, noise, fugitive emissions, and accidents. The risk assessment concludes that risks associated with the proposed development are acceptable when considered in line with the intended risk management techniques, with only two hazards posing a medium-rated risk, and the rest rated low risk.
- **Site Condition Report (SCR):** As part of this environmental permit application, an SCR has been produced for the area of land upon which the WEEE recycling facility is to be developed. It details the historic information in relation to the site and surrounding areas, as well as considering the proposed use and the potential impacts that this may have.
- **Appropriate Measures and Best Available Techniques (BAT):** Throughout the application document, technical descriptions have been provided for all site aspects and operations, including equipment and infrastructure. A full review of operations against the relevant Appropriate Measures from the most recent guidance and the relevant BAT Conclusions from the most BREF for the Waste Treatment sector has been conducted.

2. BACKGROUND AND INTRODUCTION

2.1. ABOUT THE INSTALLATION

This application is for an environmental permit for Enva's new proposed WEEE recycling facility in Dartford, Kent. The site is located approximately on grid reference TQ 57300 75590, spanning an area of 7.43 hectares (18.36 acres), with address:

Former Dartford International Ferry Terminal,
Clipper Boulevard,
Dartford,
Kent,
DA2 6QB.

The location of the site is shown in Figure 2-1 below. The new WEEE recycling facility will be located near Dartford, more specifically on the south bank of the River Thames, to the east of the Dartford River Crossing. The site is within close proximity of the A206, as well as a range of industrial building types, such as open storage, port, distribution warehouse, small storage, and industrial warehouses, offices and a hotel. Figure 2-2 details the site plan and general enhancements of the brownfield site, with the site boundary highlighted in green, the main unit within which recycling activities will be undertaken and associated external storage areas.

Figure 2-1 - Site Location

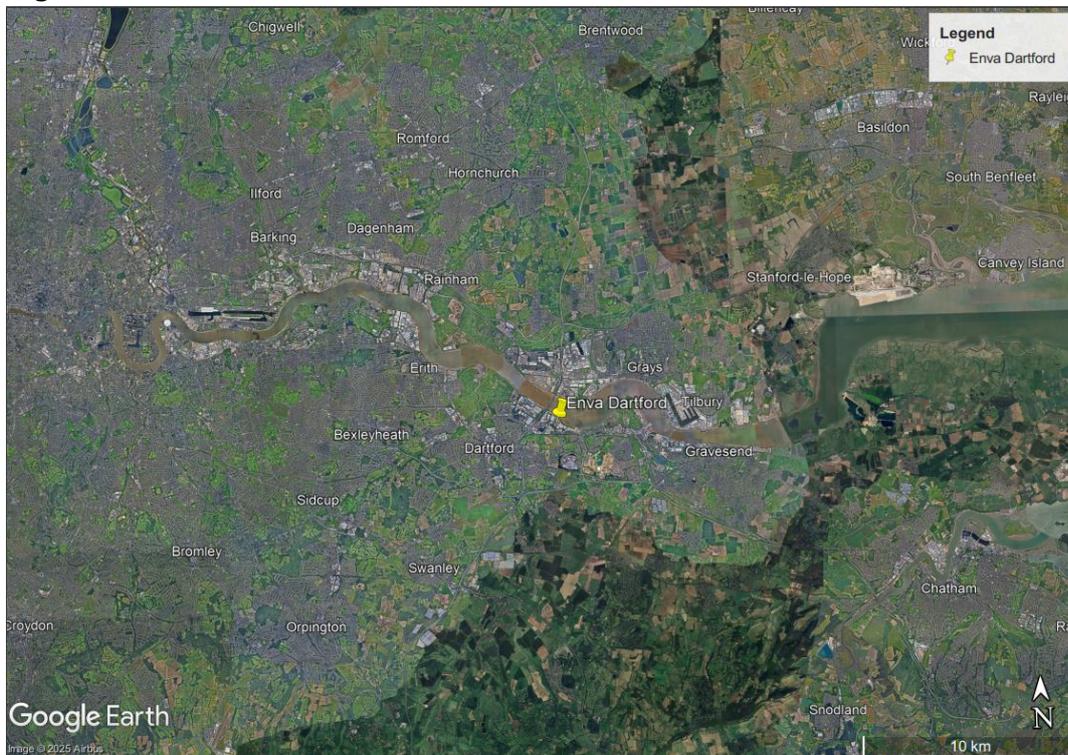
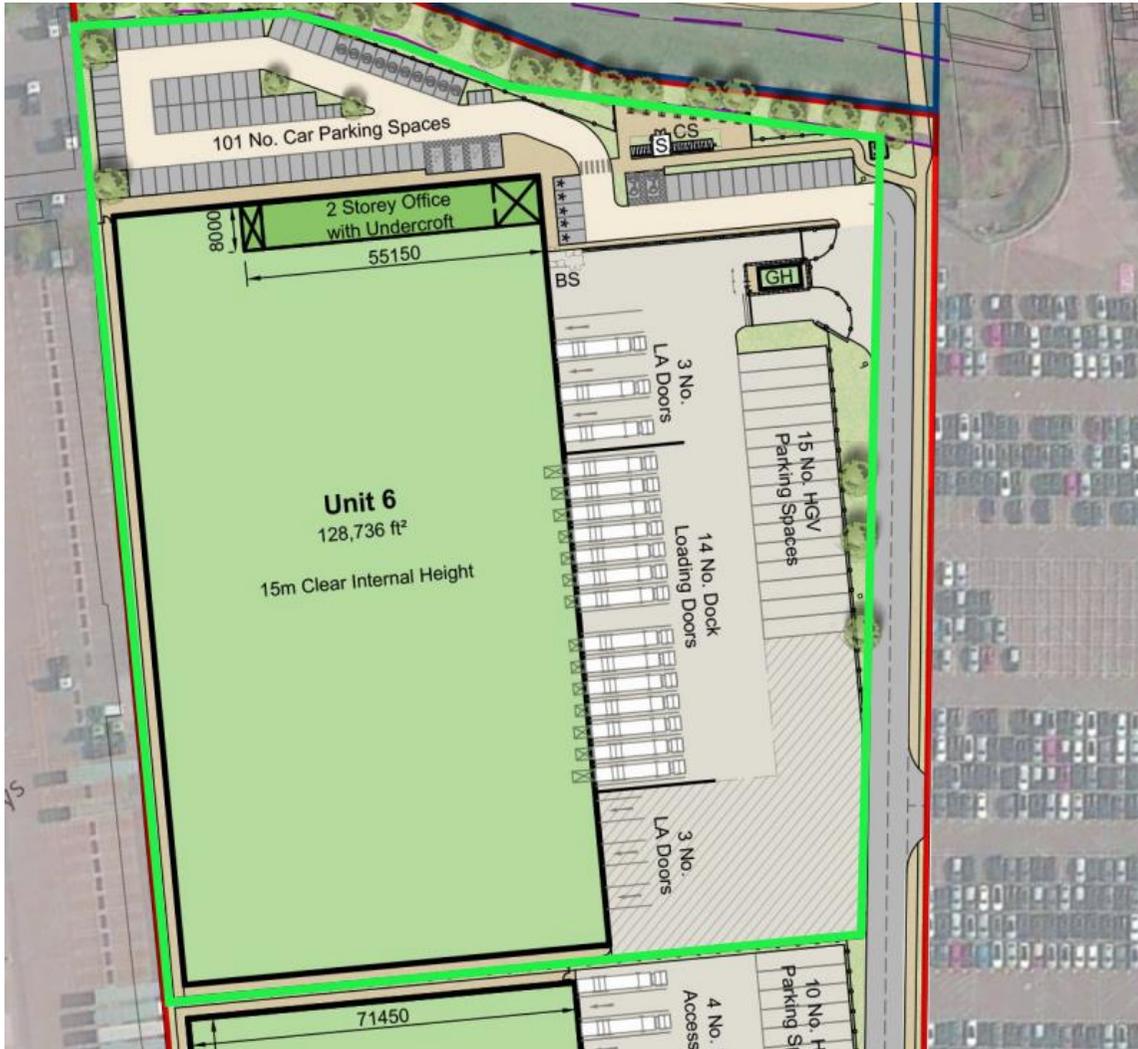


Figure 2-2 - Overall Site Layout Plan



2.1.1. FLOOD RISK

As part of the planning application, a Flood Risk Assessment (FRA) has been conducted. As part of this assessment, it was discovered that the majority of the site area is located within a defended Flood Zone 3. This defence is in the form of the Thames Wall: an embankment that mitigates fluvial and tidal flooding of the Thames. The EA Flood Maps for Planning tool¹ was utilised to gather such information.

Conclusions drawn within the FRA suggested that the development can be occupied safely, subject to the flood risk mitigation outlined in the FRA report.

2.1.2. SITES WITH ECOLOGICAL DESIGNATIONS

In terms of sites with ecological designations, within 10 km of the WEEE treatment facility, there are 16 Sites of Special Scientific Interest (SSSIs) (detailed below). However, there are no Ramsar sites, Special Protection Areas (SPAs) or Special Areas of Conservation (SACs) or ancient woodland.

The SSSIs located within the 10 km buffer include:

- Hangman's Wood & Deneholes;
- Globe Pit;
- Farningham Wood;
- Abbey Wood;
- Lion Pit;
- Ingrebourne Marshes;
- Inner Thames Marshes;
- Grays Thurrock Chalk Pit;
- Purfleet Road Aveley;
- Purfleet Chalk Pits;
- Wansunt Pit;
- Swanscombe Skull Site;
- South Thames Estuary and Marshes;
- West Thurrock Lagoon & Marshes;
- Darenth Wood;
- Swanscombe Peninsula.

There is 1 Marine Conservation Zone, Swanscombe, 1 National Nature Reserve, Swanscombe Skull Site, and the following Local Nature Reserves including:

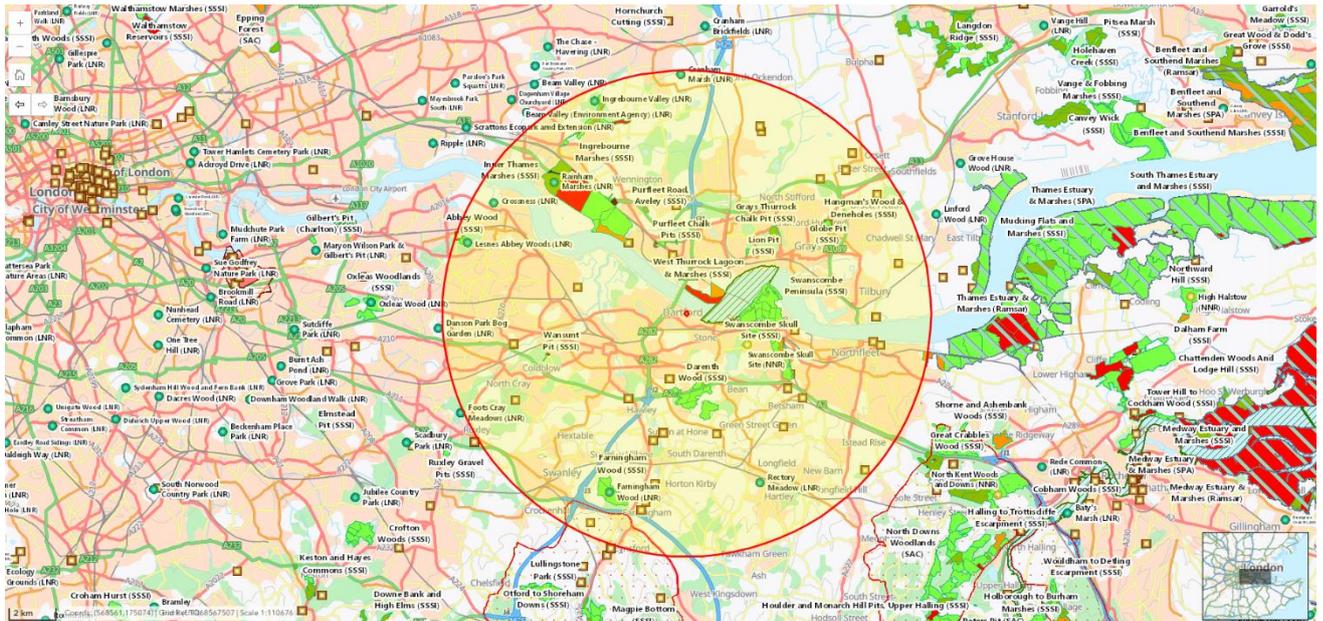
- Crossness;
- Cranham Marsh;
- Farningham Wood,
- Foots Cray Meadows;

¹ [Get flood risk information for planning in England - Flood map for planning - GOV.UK.](#)

- Ingrebourne Valley;
- Lesnes Abbey Woods;
- Rainham Marshes; and
- Rectory Meadow.

Figure 2-3 below highlights the ecological aspects of interest, in relation to a 10 km buffer surrounding the proposed site location.

Figure 2-3 - Screenshot from MAGIC Map



2.2. REGULATORY CONTEXT

As mentioned in earlier sections of this report, this development is very similar in nature to another of Enva’s sites, located in Grantham. The installation boundary would apply only to the WEEE treatment facility itself. Based on the initial design information and above detailed process descriptions, **Table 2-1** below identifies the prescribed and directly associated activities for the WEEE treatment facility under the Environmental Permitting Regulations 2016 (as amended).

Table 2-1 - EPR Prescribed and Directly Associated Activities

Activity listed in Schedule 1 of the EPR	Description of Specified Activity	Limits of Specified Activity
S5.3 A(1)(a)(ii) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment.	Treatment of waste temperature exchange equipment, involving stage 1 degassing and stage 2 destruction processes.	From treatment of waste by degassing and destruction to storage of treated waste. Treatment of waste temperature exchange equipment involving:

Activity listed in Schedule 1 of the EPR	Description of Specified Activity	Limits of Specified Activity
		<ul style="list-style-type: none"> ▪ Degassing of equipment, with collection of oil and refrigerant gas ▪ Mechanical destruction of degassed equipment, including the sorting, separation of plastic, metal and foam fractions, and treatment of foam to remove and capture the blowing agent using carbon beds. <p>Treatment of refrigeration units shall be carried out within a building provided with weatherproof covering.</p>
S5.3 A(1)(a)(ii) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment	Mechanical treatment of small mixed WEEE	From mechanical treatment of waste to storage of treated waste. Treatment limited to sorting, shredding, granulating, and separating for the purpose of recovery of constituent parts and materials.
S5.3 A(1)(a)(ii) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment	Granulation of hazardous electrical and communications cable.	From treatment of waste by granulation to storage of treated waste. Treatment limited to granulation of cable and mechanical separation of metal from insulation material.
S5.6 A(1)(a) - Temporary storage of hazardous waste in a facility with a total capacity exceeding 50 tonnes pending any of the activities listed in Section 5.1, 5.2 and 5.3.	Storage of hazardous waste pending on-site treatment or off-site transfer.	From receipt of hazardous waste on site to its treatment on site or its transfer off-site.
Directly Associated Activities		
Storage of processed materials	Storage of recovered fractions and shredder residue following treatment.	From storage of processed materials to dispatch off site for recovery.
Raw materials storage	Storage of raw materials including nitrogen, lubricating oil and diesel.	From the receipt of raw materials to dispatch for use within the facility.
Abatement systems (for emissions to air)	Bag filters, carbon filters, HEPA filter and wet scrubber serving the treatment plant.	From the input of air to the abatement system to emission to air.

Activity listed in Schedule 1 of the EPR	Description of Specified Activity	Limits of Specified Activity
Surface water discharge from roof and yard areas	Uncontaminated surface water run-off.	
Discharge to sewer under trade effluent consent	Wastewater from welfare facilities only – there will be no process water.	
Waste Operations		
Treatment and storage of non-hazardous WEEE		Storage and treatment of non-hazardous WEEE, baling of cardboard packaging waste generated from site operations, and storage of non-hazardous waste pending dispatch off-site for the purpose of recovery.

2.3. APPLICATION STRUCTURE

The application for an environmental permit consists of Forms A, B2, B3 and F1 as required under the EPR. The completed application forms, provided in Appendix A, are supported by this report which comprises the main application document detailing the proposed development on site and its environmental impact, including consideration of management techniques to avoid and control emissions and design of the process to meet BAT. The report is supported by the following appendices to provide further supporting information and detailed environmental assessments:

- Appendix A - EPR Application Forms;
- Appendix B - Site Plan
- Appendix C - Site Drainage Plan
- Appendix D - Site Condition Report;
- Appendix E - Environmental Risk Assessment;
- Appendix F - H1 Software Assessment;
- Appendix G - Fugitive Emissions Management Plan; and
- Appendix H - Fire Prevention Plan.

This report has been structured and developed in accordance with reference to the relevant technical guidance for the site activities, namely:

- Environmental permit guidance obtained from GOV.UK webpages (replacing previous EPR 1.00 'How to Comply' guidance)²;
- Waste Electrical and Electronic Equipment (WEEE): Appropriate Measures for Permitted Facilities³; and
- Waste Treatment BREF and BAT Conclusions (August 2018)⁴.

² [Environmental permitting guidance: Core guidance - GOV.UK](#)

³ [Waste electrical and electronic equipment \(WEEE\): appropriate measures for permitted facilities - Guidance - GOV.UK](#)

⁴ [Waste Treatment | EU-BRITE](#)

3. MANAGING YOUR ACTIVITIES

3.1. GENERAL MANAGEMENT

The effective management of environmental performance is a key requirement for ensuring that all pollution prevention and control techniques are delivered reliably, monitored and measured appropriately, and on an integrated basis. The Environmental Management System (EMS) helps to maintain compliance with regulatory requirements and to understand and manage all other significant environmental impacts.

The EMS to be implemented by Enva at the Dartford site will be independently certified to ISO 14001:2015 and will therefore be in line with the appropriate measures. Table 3-1, Table 3-2, Table 3-3, Table 3-4 and Table 3-5 below show sector specific BAT standards from the Waste Electrical and Electronic Equipment (WEEE): Appropriate Measures for Permitted Facilities, in relation to accident management and environmental performance. Plant decommissioning considerations are detailed in Table 3-6 in relation to these Appropriate Measures. Further to this, Table 3-7 below provides a summary of the EMS and how it meets the Environment Agency requirements (from GOV.UK guidance).

Table 3-1 - Guidance on Management Systems from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>An up-to-date written management system must be followed. It must incorporate the following features:</p> <ul style="list-style-type: none"> ■ management commitment, including from senior managers ■ an environmental policy that is approved by senior managers and includes the continuous improvement of the facility's environmental performance <p>Plan and establish the resources, procedures, objectives and targets needed for environmental performance alongside financial planning and investment.</p> <p>Implement environmental performance procedures, paying particular attention to:</p> <ul style="list-style-type: none"> ■ staff structure and relevant responsibilities ■ staff recruitment, training, awareness and competence ■ communication (for example, of performance measures and targets) ■ employee involvement ■ documentation and records 	<p>A written management system is to be implemented, complying with the requirements of the suggested appropriate measures as outlined here. The management system that will be implemented at the site will be independently certified to ISO 14001.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ effective process control ▪ maintenance programmes ▪ the management of change (including legislative changes and waste classification changes) ▪ emergency preparedness and response ▪ compliance with environmental legislation <p>Check environmental performance and take corrective action paying particular attention to:</p> <ul style="list-style-type: none"> ▪ monitoring and measurement ▪ learning from incidents, near misses and mistakes, including those of other organisations ▪ records maintenance ▪ independent (where practicable) internal or external auditing of the management system and operations to confirm it has been properly implemented and maintained <p>Senior managers review the management system at least annually to check it is still suitable, adequate and effective.</p> <p>Review the development of cleaner and more efficient technologies and their applicability to site operations.</p> <p>When designing a new plant, ensure that the environmental impacts from the plant's operating life and eventual decommissioning are assessed.</p> <p>Consider the risks a changing climate poses to your operations. Appropriate plans should be in place to assess and manage future risks.</p> <p>Compare site performance against relevant sector guidance and standards on a regular basis, known as sectoral benchmarking.</p> <p>Maintain the following documentation:</p> <ul style="list-style-type: none"> ▪ inventory of emissions to air and water ▪ residues management plan ▪ accident management plan ▪ site infrastructure plan ▪ site condition report ▪ fire prevention plan (FPP) 		

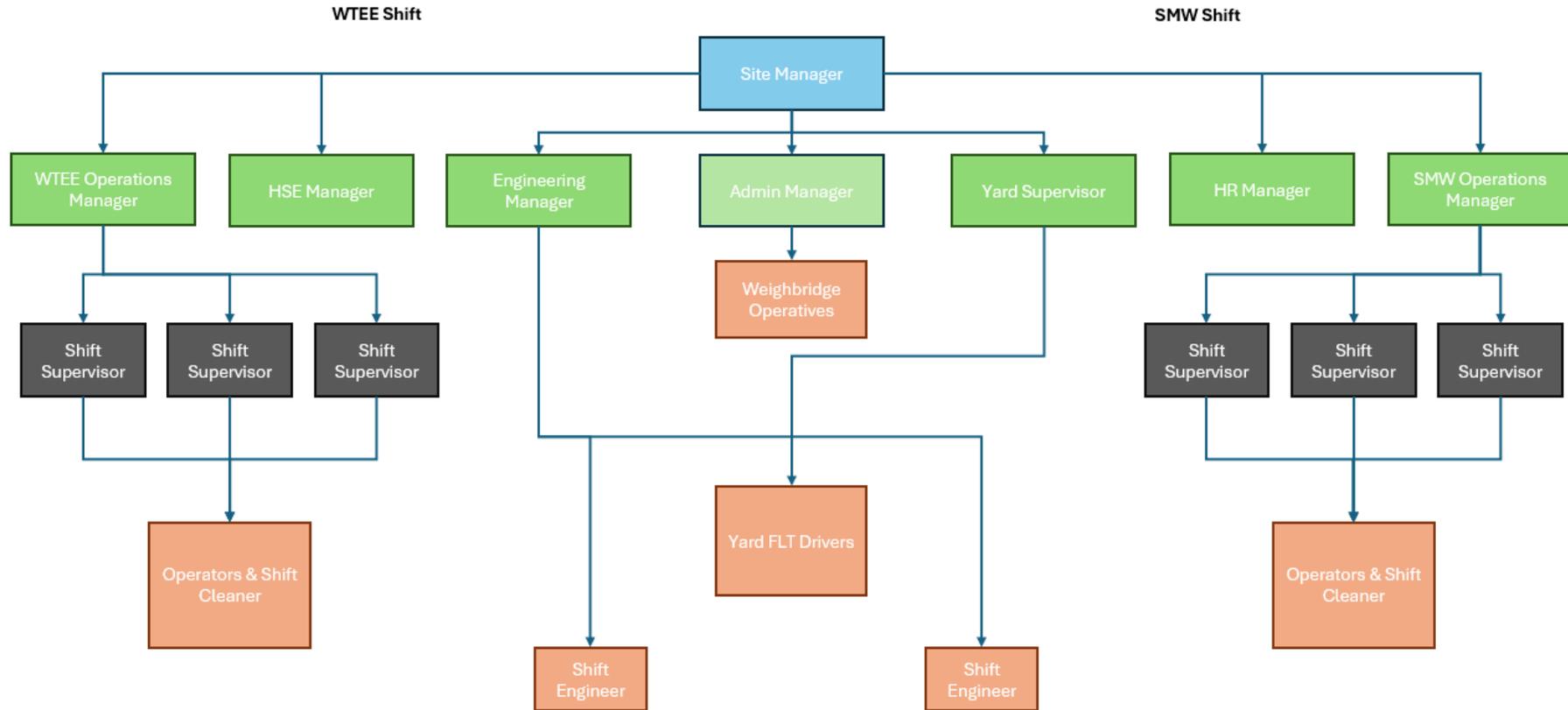
Requirements	Proposed Arrangements	Appropriate Measure?
<p>If required, maintain the following documentation:</p> <ul style="list-style-type: none"> ▪ odour management plan ▪ noise and vibration management plan ▪ dust management plan ▪ pest management plan ▪ climate change risk assessment 		

Enva will ensure that sufficient provisions are made in terms of staffing, so that safe and efficient operation of the site can be carried out. Arrangements are detailed below in Table 3-2 and Figure 3-1 provides information on the organogram structure.

Table 3-2 - Guidance on Staff Competence from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
The site must be operated at all times by an adequate number of staff with appropriate qualifications and competence.	Operations on site will be undertaken by appropriately trained and qualified staff, in adequate numbers. See site organogram below in Figure 3-1.	Yes
The design, installation and maintenance of infrastructure, plant and equipment must be carried out by competent people.	Across the site, any maintenance or developments will be carried out by the most appropriate qualified employees or external contractors.	Yes
Managers of the waste activity must be appropriately qualified who are either: qualified under a technical competence scheme operating under a Competence Management System approved under a technical competence scheme	Details on employees, competency records and other resources are recorded as per the procedures established in the EMS Manual and other site management systems. No staff have currently been employed for the site. However, the Site Manager employed will have qualifications from WAMITAB or other appropriate certification schemes for the type of waste being treated.	Yes
Non-supervisory staff must be reliable and technically skilled in the activities they are responsible for and in emergency response procedures. Their skills may be based on experience and relevant training.	Employees and related competency records are recorded as per the procedures established in the EMS Manual and other site management systems	Yes

Figure 3-1 - Organogram



In the event of an incident that has the potential to cause environmental harm, a response will be coordinated in line with procedures that are detailed in the site's EMS. Such arrangements are discussed in Table 3-3 below.

Table 3-3 - Guidance on Accident Management Plan from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measures?
As part of your management system a plan for dealing with any incidents or accidents that could result in pollution must be in place.	An Accident Management Plan for the Dartford site will be developed to include details relevant to incidents that may occur, such as spillages or explosions / fires.	Yes
The accident management plan must identify and assess the risks the facility poses to human health and the environment.	Potential incidents that may occur, such as spillages or explosions / fires will be assessed in the Accident Management Plan, for their risks, likelihood and the potential impacts that could arise at the facility, posing risks to human health and the environment.	Yes
<p>Areas to consider may include:</p> <ul style="list-style-type: none"> waste types and the risks they pose robust waste acceptance procedures to avoid receiving unwanted items, such as gas cylinders failure of abatement systems failure of plant and equipment (for example over-pressure of vessels and pipework, blocked drains) failure of containment (for example, bund failure, or drainage sumps overflowing) damaged lithium-ion batteries failure to contain firefighting water making the wrong connections in drains or other systems checking the composition of an effluent before emission vandalism and arson extreme weather conditions, for example flooding or very high winds loss of power 	A variety of potential incidents have been considered throughout the development of the Accident Management Plan. These are also considered within the Environmental Risk Assessment within Appendix E.	Yes
The risk of accidents and their possible consequences must be assessed. Risk is the combination of the likelihood that a hazard will occur and the severity of the impact resulting from that hazard. Having identified the hazards, you can assess the risks by addressing 6 questions: how likely is it that the accident will happen?	<p>The plan will include:</p> <ul style="list-style-type: none"> ■ Description of the accidents which could occur; ■ Likelihood of occurrence; ■ Consequence of occurrence; 	Yes

Requirements	Proposed Arrangements	Appropriate Measures?
<p>what may be emitted and how much? where will the emission go – what are the pathways and receptors? what are the consequences? what is the overall significance of the risk? what can you be done to prevent or reduce the risk?</p>	<ul style="list-style-type: none"> ■ Actions to minimise the likelihood of occurrence; and ■ Actions to be undertaken if the event occurs. 	
<p>Fire risks must be identified that may be caused, for example, by: arson or vandalism self-combustion, for example the finer fractions of shredder residue plant or equipment failure and electrical faults naked lights and discarded smoking materials hot works (for example welding or cutting), industrial heaters and hot exhausts neighbouring site activities sparks from loading buckets hot loads deposited at the site damage to, or shorting of, batteries A fire prevention plan (FPP) must be in place that identifies the risks at the site and meets the requirements of the fire prevention guidance⁵.</p>	<p>A Fire Prevention Plan (FPP) has been drawn up that addresses all the relevant appropriate measures under this condition. This is appended to this report, in Appendix H.</p>	<p>Yes</p>
<p>The depth and type of accident risk assessment to be carried out will depend on the characteristics of the plant and its location. The main factors to consider are the: scale and nature of the accident hazard presented by the plant and its activities risks to areas of population and the environment (the receptors) nature of the plant and complexity of the activities and how difficult it is to decide and justify adequate risk control techniques</p>	<p>The Accident Management Plan has been developed with consideration as to the location of the site, the local receptors, the activities on site and the controls measures that are possible for implementation at the site for the control of identified accidents.</p>	<p>Yes</p>
<p>Through the accident management plan, the roles and responsibilities of the staff involved in managing accidents must be identified. They must be provided with clear guidance on how to manage each accident scenario, for example, whether to use</p>	<p>Details of responsibilities of different roles at the site are included in the Accident Management Plan and the relevant people are aware of the relevant duties.</p>	<p>Yes</p>

⁵ <https://www.gov.uk/government/publications/fire-prevention-plans-environmental-permits>.

Requirements	Proposed Arrangements	Appropriate Measures?
containment or dispersion to extinguish fires, or let them burn.	All matters in relation to fires will be detailed within the FPP (Appendix H).	
One facility employee must be appointed as an emergency co-ordinator who will take lead responsibility for implementing the plan. Employees must be trained so they can perform their duties effectively and safely and know how to respond to an emergency.	An emergency coordinator will be appointed to ensure the plan is actioned when necessary. All employees will have sufficient training to ensure that responsibilities are effectively fulfilled both in terms of general operations and emergency response.	Yes
The following must occur at the facility: establish communication methods with relevant authorities, emergency services and neighbours (as appropriate) both before, during and after an accident have appropriate emergency procedures, including for safe plant shutdown and site evacuation have post-accident procedures that include assessing the harm that may have been caused by an accident and the remediation actions you will take test the plan by carrying out emergency drills and exercises	Across the site, in order to ensure the effective implementation of the Accident Management Plan, communication methods and emergency procedures will be established for before, during and after an incident occurs. Testing of such plan will be conducted to ensure an efficient response to an emergency. The Fire and Rescue Service (FRS) will be provided with a copy of the FPP for their reference. There will also be rehearsals on response to a fire that include the FRS, to ensure their familiarity with the site layout and the risks that are posed.	Yes

In order to protect the environment, various provisions will be in place supporting activities that will be undertaken at the Dartford site. **Table 3-4** provides an outline of these measures that Enva will implement.

Table 3-4 - Guidance on Accident Prevention Measures from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
The following measures must be taken, where appropriate, to prevent events that may lead to an accident.	Effective response measures are outlined in the Accident Management Plan.	Yes
Incompatible wastes must be kept apart.	Storage of wastes on site is considerate of any incompatibilities to prevent any accidents through unwanted reactions. The waste types to be received and processed are not generally incompatible.	Yes
The following must be contained for off-site disposal or route to the sealed drainage system as appropriate: <ul style="list-style-type: none"> ▪ process waters; 	Effective drainage measures are in place on site. These are detailed in the drainage plan. Site drainage collects surface water run-off and, via the use of a penstock valve, in the	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ site drainage waters; ▪ emergency firefighting water; ▪ oil or chemical contaminated waters; and ▪ spillages of oils and chemicals. 	<p>event of an incident or fire on site, harmful water cannot be released to the wider environment from the attenuation tank.</p> <p>It is not anticipated that there will be any fugitive emissions to water, however an oil interceptor will be implemented, which will then be followed by a holding tank. Testing of the run-off can be conducted from this holding tank. In the event that contamination is detected, the drainage system can be shut off.</p>	
<p>Surges and storm water flows must be able to be contained. Enough buffer storage capacity must be provided to ensure that this can be achieved. This capacity can be defined using a risk-based approach, for example, by considering the:</p> <ul style="list-style-type: none"> ▪ nature of the pollutants; ▪ effects of downstream waste-water treatment; and ▪ sensitivity of the receiving environment. 	<p>The capacity of the surface water attenuation tank is 1000 m³. This is sufficient for the site's surface water run-off and an oil interceptor will be installed at the entry into the holding tank to remove any contaminants.</p>	Yes
<p>Wastewater is only to be discharged from this buffer storage after appropriate measures have been taken, for example, to control, treat or reuse the water. Discharges to ground, surface water or sewer must be lawful and must comply with any consents or permissions that are required.</p>	<p>Prior to entry into the tank, the surface water run-off will pass through an oil interceptor to remove any potential contaminants. Penstock valves that support the attenuation tank can be closed in the event of a pollution incident.</p>	Yes
<p>Spill contingency procedures must be in place to minimise the risk of an accidental emission of raw materials, products and waste materials, and to prevent their entry into water.</p>	<p>As detailed in the Environmental Risk Assessment, there are many protocols in place to prevent risks and damage that could arise as a result of any spills. These include:</p> <ul style="list-style-type: none"> ▪ Bunded containers for materials and facilities as necessary; ▪ Spill response equipment stored in relevant areas, containing spill dry granules, spill control absorbent socks and drain covers; ▪ Regular inspections as part of the general housekeeping; and ▪ Appropriate training given to staff in responding to spillages. 	Yes
<p>The facility's emergency firefighting water collection system must take account of additional firefighting water flows or</p>	<p>The aspects of firefighting water collection and potential for contaminated water to</p>	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
<p>firefighting foams. Emergency storage lagoons may be needed to prevent contaminated firefighting water reaching a receiving water body. This should be considered as part of the fire prevention plan.</p>	<p>enter a receiving water body are fully detailed in the FPP.</p>	
<p>Consider and, if appropriate, plan for the possibility that containment or abatement will be required of accidental emissions from:</p> <ul style="list-style-type: none"> ■ Overflows; ■ Vents; <p>Safety relief valves; and</p> <ul style="list-style-type: none"> ■ Bursting discs. <p>If this is not advisable on safety grounds, reducing the probability of the emission must be focussed on.</p>	<p>A variety of containment measures are incorporated into the facility's design, including bunding of various tanks and emission control systems for deconstruction process vents.</p>	<p>Yes</p>
<p>Security measures must be in place (including staff) to prevent:</p> <ul style="list-style-type: none"> ■ entry by vandals and intruders; ■ damage to plant and equipment; ■ theft; ■ fly-tipping; and ■ arson. 	<p>The site will be protected by a range of security-related measures, which include:</p> <ul style="list-style-type: none"> ■ Weighbridge staff will be present 24 hours per day, 7 days per week, monitoring and admitting inbound and outbound loads; ■ CCTV and alarms are to be situated across the site; and ■ A third-party security contractor will be employed in monitoring the (motion-sensor) CCTV 24 hours per day, 7 days per week. 	<p>Yes</p>
<p>Facilities must use an appropriate combination of the following measures:</p> <ul style="list-style-type: none"> ■ security guards; ■ total enclosure (usually with fences); ■ controlled entry points; ■ adequate lighting; ■ warning signs; and ■ 24-hour surveillance, such as closed-circuit television (CCTV). 	<p>As above, the site will be secured via CCTV and alarms, monitored by a third-party security contractor, in operation 24 hours per day, 7 days per week.</p>	<p>Yes</p>
<p>There are 3 fire prevention objectives. Facilities must:</p>	<p>The objectives for fire prevention are explained in the FPP and align with those given here.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ■ minimise the likelihood of a fire happening; ■ aim for a fire to be extinguished within 4 hours; and ■ minimise the spread of fire within the site and to neighbouring sites. 		
<p>A fire prevention plan must be in place that meets the requirements of the fire prevention plan guidance⁵.</p>	<p>An FPP has been developed and supports this application. This is appended in Appendix H.</p>	<p>Yes</p>
<p>Plant control must be maintained in an emergency using one or a combination of:</p> <ul style="list-style-type: none"> ■ alarms; ■ process trips and interlocks; ■ automatic systems; and ■ manual interventions. 	<p>A variety of protocols are in place on site for safety during an emergency, including alarm systems and automatic systems.</p>	<p>Yes</p>
<p>Facilities must:</p> <ul style="list-style-type: none"> ■ make sure all the measurement and control devices needed in an emergency are easy to access and operate in an emergency situation. ■ maintain the plant so it is in a good state through a preventive maintenance programme and a control and testing programme. ■ use techniques such as suitable barriers to prevent moving vehicles damaging equipment. ■ have procedures in place to avoid incidents due to poor communication between operating staff during shift changes and following maintenance or other engineering work. ■ where relevant, use equipment and protective systems designed for use in potentially explosive atmospheres. 	<p>Procedures that form part of the EMS, when developed, will provide details on maintenance plans, testing protocols, communication measures and protection of equipment.</p>	<p>Yes</p>
<p>Facilities must:</p> <ul style="list-style-type: none"> ■ keep an up-to-date record of all accidents, incidents, near misses, changes to procedures, abnormal events, and the findings of maintenance inspections 	<p>In the event of an accident or emergency, procedures are adhered to relating to incident/accident investigation and the records to be kept in relation to these incidents, investigations into incidents that have occurred, maintenance, monitoring</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ carry out investigations into accidents, incidents, near misses and abnormal events and record the steps taken to prevent their reoccurrence ▪ maintain an inventory of substances, which are present (or likely to be) and which could have environmental consequences if they escape – many apparently innocuous substances can damage the environment if they escape ▪ have procedures for checking raw materials and wastes to make sure they are compatible with other substances they may accidentally come into contact with ▪ make sure that any documents that may be needed in the event of an incident are accessible 	<p>and preparation for the event of an accident or emergency.</p>	

Contingency measures will be available in preparation for an accident or incident that requires such a response, outlined in the site’s EMS. Such measures will be key in ensuring that environmental harm will be prevented in the event of an accident. Table 3-5 provides an outline of the arrangements that will be in place at the Dartford facility.

Table 3-5 - Guidance on Contingency Plan and Procedures from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Contingency plans and management procedures must be implemented to make certain that all permit conditions are complied with and operating procedures during maintenance or shutdown at the site.</p>	<p>Compliance with permit conditions will be supported via the implementation of contingency plans and management procedures. Plans include:</p> <ul style="list-style-type: none"> ▪ Business Continuity Threat Plan; ▪ Emergency Disaster Plan; and ▪ Emergency procedures and risk assessments. 	<p>Yes</p>
<p>The contingency plan must also contain provisions and procedures to make sure that:</p> <ul style="list-style-type: none"> ▪ storage limits in the permit are not exceeded and that appropriate measures continue to be applied for storing and handling waste. 	<p>In the event that waste is unable to be accepted to Dartford WEEE waste recycling facility corporate business continuity procedures would be enacted and the waste diverted to other sites within the group that could accept and treat the waste.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ acceptance of waste is stopped unless there is a clearly defined method of recovery or disposal and enough permitted storage capacity. ▪ as far as possible know in advance about any planned shutdowns and waste management facilities where waste is sent. <p>The contingency plan must include plans and procedures for circumstances where wastes cannot be sent to other sites due to their planned or unplanned shutdown.</p>		
<p>If an end-of-waste material is produced at the facility, the contingency plan must consider issues with storage capacity for end-of-waste products.</p>	<p>No end of waste material produced at the site.</p>	<p>N/A</p>
<p>Customers should be made aware of the contingency plan, and of the circumstances in which waste would stop being accepted from them.</p>	<p>In the event that waste is unable to be accepted to Dartford WEEE waste recycling facility corporate business continuity procedures would be enacted and the waste diverted to other sites within the group that could accept and treat the waste.</p> <p>All waste providers would be made aware should this need to be enacted.</p>	<p>Yes</p>
<p>Consider whether the sites or companies being relied on in the contingency plan:</p> <ul style="list-style-type: none"> ▪ can take the waste at short notice. ▪ are authorised to do so in the quantities and types likely to be needed – in addition to carrying out their existing activities. 	<p>The site has multiple sites within the group that can accept and treat the waste without relying on external third parties.</p>	<p>Yes</p>
<p>Where circumstances mean permitted storage limits could be exceeded or storage procedures could be compromised, look for alternative disposal or recovery options. Alternative disposal or recovery options must not be discounted based on extra cost or geographical distance.</p>	<p>Enva has multiple sites within the group that can accept and treat the waste should the permitted limits be reached, without relying on external third parties.</p>	<p>Yes</p>
<p>Unauthorised capacity must not be included in the contingency plan. If the contingency plan includes using temporary storage for additional waste on site, authorisation for this storage must be obtained and ensure the appropriate infrastructure is in place.</p>	<p>No unauthorised capacity will be included within any business continuity plans.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<p>The management procedures and contingency plan must:</p> <ul style="list-style-type: none"> ▪ identify known or predictable malfunctions associated with the technology and the procedures, spare parts, tools and expertise needed to deal with them. ▪ include a record of spare parts held, especially critical spares – or state where you can get them from and how long it would take. ▪ have a defined procedure to identify, review and prioritise items of plant which need a preventative regime. ▪ include all equipment or plant whose failure could directly or indirectly lead to an impact on the environment or human health. ▪ identify ‘non-productive’ or redundant items such as tanks, pipework, retaining walls, bunds, reusable waste containers (for example wheeled carts), ducts, filters and security systems. ▪ make sure there are the spare parts, tools, and competent staff needed before starting maintenance. 	<p>Business continuity is managed at a group level.</p> <p>Any failures related to equipment or other operational matters are dealt with through management techniques including preventative maintenance programmes, including key spares, call off contracts with maintenance providers, inspection and monitoring programmes for key infrastructure such as tanks, pipework, hardstanding and bunds.</p>	N/A
<p>The management system must include procedures for auditing performance against all these contingency measures and for reporting the audit results to the site manager.</p>	<p>The management system will include for audits of all performance related matters and is reported to the Site Manager.</p>	Yes

Even though the site has not yet been developed, decommissioning plans will be considered in the preparation of the site, as discussed below in **Table 3-6**.

Table 3-6 - Guidance on Plant Decommissioning from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Decommissioning of the plant must be considered at the design stage and suitable plans should be made to minimise risks during later decommissioning.</p>	<p>The plant is a modular based plant and can be easily deconstructed for decommissioning.</p>	Yes
<p>For existing plant, identify potential decommissioning risks and take steps to</p>	<p>The plant is a new build and is not existing.</p>	N/A

Requirements	Proposed Arrangements	Appropriate Measure?
<p>address these. Make changes and design improvements as and when plant is upgraded, or when construction and development works are carried out at the site. Examples of design improvements could include avoiding using underground tanks and pipework. If it is not economically possible to replace them, they must be protected by secondary containment or a suitable monitoring programme.</p>		
<p>A suitable decommissioning plan must be maintained to demonstrate that:</p> <ul style="list-style-type: none"> ▪ plant will be decommissioned without causing pollution. ▪ the site will be returned to a satisfactory condition. 	<p>A decommissioning plan will be developed for the management system prior to the site becoming operational.</p>	<p>Yes</p>
<p>The decommissioning plan should include details on:</p> <ul style="list-style-type: none"> ▪ whether pipelines and vessels will be removed or flushed out and how they will be emptied of any potentially harmful contents. ▪ site plans showing the location of all underground pipes and vessels. ▪ how asbestos or other potentially harmful materials will be removed, unless we have agreed it is reasonable to leave such liabilities to future owners. ▪ methods for dismantling buildings and other structures, and for protecting surface water and groundwater during construction or demolition at the site. ▪ any soil testing needed to check for any pollution caused by the site activities, and information on any remediation needed to return the site to a satisfactory state when you cease activities, as defined by the initial site condition report. ▪ the measures proposed, once activities have definitively stopped, to avoid any pollution risk and to return the site of operation to a satisfactory state (including, where appropriate, measures relating to the design and construction of the plant). 	<p>The decommissioning plan will include all these requirements when developed.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> the clearing of deposited residues, waste and any contamination resulting from the waste treatment activities. 		
<p>Ensure that equipment taken out of use is decontaminated and removed from the site.</p>	<p>All equipment to be removed from site would be isolated, emptied of all solid waste and liquids, such as oils, prior to dismantling. The equipment would then be cleaned out and fully decontaminated prior to off-site removal.</p>	<p>Yes</p>

Alongside Appropriate Measures for WEEE Permitted Facilities³, GOV.UK guidance² has been consulted in Table 3-7 to understand the suitability of the arrangements to be implemented at the facility.

Table 3-7 - Guidance on Environmental Management Systems from GOV.UK.

GOV.UK Requirements	Proposed Arrangements	BAT?
<p>As part of the Environmental Management System guidance available on the GOV.UK website, the following should be incorporated:</p> <p>You must include a Site Infrastructure Plan which highlights where the activities covered by an Environmental Permit are undertaken. Your plan must also include:</p> <ul style="list-style-type: none"> Buildings and other main constructions such as treatment plants, incinerators, storage silos and security fencing; Storage facilities for hazardous materials like oil and fuel tanks, chemical stores, waste materials; Locations of items for use in accidents and emergencies; Entrances and exits to be used by emergency services; Pollution control points, such as inspection and monitoring points; Trade effluent or sewage effluent treatment plants; Effluent discharge points; and Contaminated land, or land you believe is contaminated. <p>The plan must also demonstrate areas which are vulnerable to pollution from the site, such as rivers and streams; groundwater sources;</p>	<p>As part of the EMS, Enva will ensure that all necessary documents for operational planning and control for this site are maintained, including a site infrastructure plan detailing all relevant information.</p> <p>Nearby environmental receptors will be highlighted on the site plan. Drainage plans, as well as utility-related provisions will be included.</p>	<p>Yes</p>

GOV.UK Requirements	Proposed Arrangements	BAT?
<p>residential, commercial or industrial premises; and protected wildlife.</p> <p>Your plan must show foul and combined drainage facilities marked in red and surface water drainage facilities in blue. It must also show:</p> <ul style="list-style-type: none"> ■ The direction of flow of the water in the drain; ■ The location of discharge points to sewer, watercourse or soakaway; ■ The location of manhole covers and drains; and ■ The location of stop and diverter valves and interceptors. <p>Your plan must show the location of mains water, gas and electricity supplies on your site, including:</p> <ul style="list-style-type: none"> ■ The main water stop tap; ■ Gas and electric isolating valves and switches; and ■ The routes for gas, electricity and water supplies around the site. <p>If your permit covers a standalone water discharge activity or point source standalone groundwater activity, your site plan must show:</p> <ul style="list-style-type: none"> ■ Your wastewater treatment plant ■ Monitoring points; ■ The location of emergency equipment; ■ The location of any mitigation measures referred to in your management system; The outlet to surface water; and The infiltration system (standalone groundwater activities only). 		
<p>Site Operations</p> <p>List the operations that will be carried out on your site during start up, normal operation and shut down.</p> <p>For waste, mining waste, and installation, list the wastes that will be produced by each activity or process.</p> <p>List the steps that you will take to prevent or minimise risks to the environment from each activity or process and type of waste.</p> <p>If you are a waste operator, you must include a waste storage plan that states:</p>	<p>Within the EMS, all significant environmental impacts arising as a result of operations to be carried out on site are detailed. Waste management and storage protocols are included throughout Section 4 of this report, alongside the types and quantities of each waste type.</p> <p>An FPP has been developed and will accompany this report as part of the environmental permit application. Within the FPP, measures to minimise the likelihood of</p>	<p>Yes</p>

GOV.UK Requirements	Proposed Arrangements	BAT?
<ul style="list-style-type: none"> ■ The longest amount of time you will store each type of waste; ■ How you will make sure you will not exceed these time limits; ■ The maximum amount of each type of waste you will store in terms of volume; ■ The maximum height of each storage pile on site; ■ How you will identify the specific types of waste you are storing; ■ How you will separate different types of waste if required; and ■ How you will make sure your site only takes waste that your permit allows you to store. <p>Fire Prevention Plans</p> <p>If you need a permit for waste activities and you plan to store combustible waste, you will need to write a fire prevention plan and submit it with your application. This must explain how you would prevent fire at your site or manage risks from fire if one occurs.</p>	<p>a fire happening and reduce the risks if one does occur are described and implemented.</p>	
<p>You will need to produce a Site and Equipment Maintenance Plan, detailing how you will maintain the site infrastructure and any machinery.</p>	<p>Preventative maintenance procedures will be implemented across the site, using a software-based system.</p>	<p>Yes</p>
<p>You will need Contingency Plans to demonstrate how you minimise the impact on the environment of any:</p> <ul style="list-style-type: none"> ■ Breakdowns; ■ Enforced shutdowns; and ■ Any other changes in normal operations. <p>A changing climate and how this could affect your operations should also be considered as part of contingency planning.</p>	<p>Business continuity is managed at a group level.</p> <p>Breakdowns and enforced shutdowns are managed through preventative maintenance programmes</p> <p>Contingency measures incorporated into the EMS, to ensure that the site is prepared for unexpected circumstances, such as those listed, as well as implementation of preparations for a changing climate and associated impacts would include:</p> <ul style="list-style-type: none"> ■ Business Continuity Threat Plans; ■ Emergency and Disaster Plan; and ■ Existing Emergency Procedures 	<p>Yes</p>
<p>You will need an Accident Prevention and Management Plan which details how you would deal with any incidents or events that could result in pollution. This plan must:</p>	<p>An Accident Management Plan will be developed to support this facility, outlining incidents and subsequent response to incidents which could occur on site, such as spillages and fire / explosion.</p>	<p>Yes</p>

GOV.UK Requirements	Proposed Arrangements	BAT?
<ul style="list-style-type: none"> ■ Identify any potential accidents or other unexpected incidents which could cause an unexpected change to normal operations. <p>For each potential incident, the following must be stated:</p> <ul style="list-style-type: none"> ■ Likelihood of the accident happening; ■ Consequences of the accident happening; ■ Measures taken to avoid the accident happening again; ■ Measures to minimise any impact if the accident happens. <p>The plan must also say how you will record, investigate and respond to accidents or breaches of your permit.</p> <p>It must also include:</p> <ul style="list-style-type: none"> ■ Date last reviewed; ■ Date of next review; ■ List of emergency contacts and how to reach them; ■ List of substances stored at your site and storage facilities; and ■ Forms to record accidents on. 	<p>Included in the plan are:</p> <ul style="list-style-type: none"> ■ Description of potential accidents; ■ Likelihood of occurrence; ■ Consequence of occurrence; ■ Actions to minimise the likelihood of occurrence; and ■ Actions to be undertaken if the event does occur. <p>A record of any incidents that occur and the response that is carried out will be logged – details on the way in which this will be conducted are incorporated into the Emergency and Disaster Plan. A software-based systems to support the Investigation and Corrective Action Plan will be implemented and reviewed monthly, in relation to health, safety and the environment.</p> <p>The documents discussed here will form part of the EMS.</p>	
<p>Contact information for the public</p> <p>If you have a waste or installations permit you must display a notice board at or near the site entrance telling the public about the site. It must include:</p> <ul style="list-style-type: none"> ■ The permit holder’s name; ■ An emergency contact name and telephone number; ■ A statement that the site is permitted by the Environment Agency; ■ Environment Agency telephone number and incident hotline. <p>For other permits, a notice board is optional.</p>	<p>Near to the site entrance, required information will be displayed, including relevant names and contact numbers, in order to prepare for the event in which the general public need to contact the operator.</p>	Yes
<p>You need a Complaints Procedure to record:</p> <ul style="list-style-type: none"> ■ Any complaints you receive in relation to activities covered by your permit; ■ How complaints are investigated; and ■ Any actions taken as a result of complaints. 	<p>As part of Enva’s EMS, a complaints procedure is to be implemented. Any complaints will be responded to in accordance with the procedure and will be logged. Any response, outcome or feedback shall be reported to the EA or the complainant, as appropriate.</p>	Yes

GOV.UK Requirements	Proposed Arrangements	BAT?
<p>Include details in the management system for Staff Resources, including;</p> <ul style="list-style-type: none"> ■ An explanation of who is responsible for what procedures; ■ Technical competency records; ■ A list of roles carried out in relation to activities covered in the permit and by whom; and ■ Competency check procedure and training records. 	<p>Established within the EMS, employees and their responsibilities will be detailed, alongside competency checks and training records and the procedures that should be adhered to for this to be maintained.</p> <p>This will include technical competency records and the attendance at site by the technically competent manager.</p>	<p>Yes</p>
<p>Record Keeping</p> <p>Any records required by your permit must be kept.</p> <p>You must keep records to show how your management system is being implemented.</p> <ul style="list-style-type: none"> ■ Records to be kept include; ■ Permits issued to the site; ■ Other legal requirements; ■ Risk assessment; ■ All management system plans; ■ Any other plans required by the application or permit (e.g. noise); ■ All operating procedures; ■ Staff competency and training; ■ Emissions and any other monitoring undertaken; ■ Compliance checks, findings of investigation and actions taken; ■ Management reviews and audits, and changes made to the management system; and ■ Certification audit reports and any actions carried out. <p>Waste Operators must also record the following for each waste delivery to the site:</p> <ul style="list-style-type: none"> ■ Quantity (weight and volume); ■ LoW code; ■ Origin of waste; ■ Producer identity of the waste; ■ Date of arrival of the waste to site; ■ Date when the waste was produced; 	<p>Record keeping protocols are detailed in Enva's EMS.</p> <p>Records and documents relating to environmental aspects are contained in a data capture system, Tegos.</p> <p>Information and records to support regulatory requirements as a WEEE recycling facility are stored and generated in this system.</p> <p>As a Waste Operator, Enva are able to track necessary details and provide necessary reports on the waste being treated on site, as required.</p> <p>A Site Condition Report (SCR) for the Dartford facility has been produced and accompanies this application, covering the relevant areas as detailed here. Enva will regularly update records of incidents and measures taken to protect land and groundwater throughout the operational phase of the site.</p>	<p>Yes</p>

GOV.UK Requirements	Proposed Arrangements	BAT?
<ul style="list-style-type: none"> ■ Quarantined materials as part of the delivery; ■ Duty of Care records; and ■ Compliance with the site record and return requirements for hazardous waste. <p>If you hold a permit for waste, mining waste or installations, a Site Condition Report is required.</p> <p>This must detail the condition of land or quality of groundwater on the site and be kept updated regularly. The following information should be included:</p> <ul style="list-style-type: none"> ■ Details of historic spills or contamination and the response so such incidents; and ■ Evidence of the effectiveness of any measure you have taken to protect land and groundwater. 		
<p>To enable checks to be carried out to ensure that you are complying with your permit, procedures and management systems, a procedure must be in place. Details of the checks carried out, by whom and the action taken all need to be recorded.</p> <p>The management system should be reviewed and updated when:</p> <ul style="list-style-type: none"> ■ Changes are made to the site, operations, or equipment that affect activities covered by your permit; ■ If you apply to change / vary your permit; ■ After an accident, complaint or breach of your permit; and ■ If a new environmental issue is encountered and new control measures are implemented. <p>A record should be kept of changes made to the management system.</p>	<p>Enva will maintain an EMS Manual to detail the approach taken to environmental auditing and Management Reviews.</p> <p>The EMS will be updated as and when required subject to annual management review or when operational changes are made to the site.</p>	<p>Yes</p>

Furthermore, arrangements have been considered against the Waste Treatment BREF guidelines, to ensure robustness of the plans in relation to provisions in the event of an accident. This is detailed below in Table 3-8.

Table 3-8 - BAT Requirements for Accident Management from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangements	BAT?
<p>BAT 1: In order to improve the overall environmental performance BAT is to implement and adhere to an environmental management system (EMS) that incorporates all required features.</p>	<p>An EMS will be implemented on site certified to ISO 14001:2015</p>	<p>Yes</p>
<p>BAT 2: In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques given below: Set up and implement waste characterisation and pre-acceptance procedures; Set up and implement waste acceptance procedures; Set up and implement a waste tracking system and inventory; Set up and implement an output quality management system; Ensure waste segregation; Ensure waste compatibility prior to mixing or blending of waste; and Sort incoming solid waste.</p>	<p>As a WEEE treatment facility, Enva have measures in place to characterise waste and operate a pre-acceptance protocol, acceptance procedures and waste tracking throughout all treatment streams. Output quality management is ensured via a variety of measures embedded in onsite operations, particularly for WEEE streams – these are described in detail in Section 4 of this application document. Waste segregation is effectively undertaken on site, occurring as part of the process determination that follows after waste has been accepted, to supporting sorting of incoming solid waste, but also as part of post-shredding residual material separation, which in turn supports in ensuring waste compatibility.</p>	<p>Yes</p>
<p>BAT 3: In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the EMS, that incorporates all of the required features.</p>	<p>Emissions from the site are detailed in Section 5 and these will be considered to make up the emissions inventory.</p>	<p>Yes</p>
<p>BAT 4: To reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given below: Optimised storage location; Adequate storage capacity; Safe storage operation; and Separate area for storage and handling of packaged hazardous waste.</p>	<p>Adequate capacity for storage has been considered and accounted for in the design of the Dartford facility, as well as well-defined areas for storage of waste at various stages of the treatment process. The site layout plan is included as Figure 2-2 and details the above aspects. Packaged hazardous waste is not proposed to be received.</p>	<p>Yes</p>
<p>BAT 5: In order to reduce the environmental risk associated with the handling and transfer of waste, BAT is to set up and implement handling and transfer procedures.</p>	<p>Unloading and handling of waste will be conducted in such a way so as to minimise damage and risk of emission, maximising reuse opportunities. For example, fridges are to be handled by clamping by their sides. The waste will be off-loaded to a building with designated storage areas prior to treatment such as degassing/battery removal and full deconstruction.</p>	<p>Yes</p>

BREF Requirements	Proposed Arrangements	BAT?
<p>BAT 21: In order to prevent or limit environmental consequences of accidents and incidents, BAT is to use all of the techniques given below, as part of the accident management plan:</p> <p>Protection measures;</p> <p>Management of incidental / accidental emissions; and</p> <p>Incident / accident registration and assessment system.</p>	<p>An Accident Management Plan is to be developed for the facility, which details the potential incidents that could arise, the most appropriate response to potential incidents and the records that will be maintained in regard to the response to an investigation of any incidents that occur.</p> <p>An Environmental Risk Assessment has been included as part of this application which addresses most of these requirements.</p>	<p>Yes</p>

3.2. ENERGY EFFICIENCY

Operations at the proposed WEEE facility will use energy in the most efficient way – measures suggested to achieve this are outlined within this section. A review will be carried out every four years, in accordance with the environmental permit when issued- or sooner where the site operations are subject to significant changes, to ensure that any opportunities for improvement of energy efficiency will be captured and appropriate measures implemented. The energy source that will be predominantly utilised to power the facility will be electricity, however, as the site has not yet been constructed, actual usage figures cannot be provided. It is expected that, energy usage at the Dartford facility is likely to reflect that of other similar Enva facilities, for example, Enva’s Grantham site has a usage of approximately 3774 MWh per year. Solar panel electricity supply will also be available on site - it will make a reasonable contribution to that that is used for recycling operations, with an estimated annual energy production of 1,422 MWh. Energy efficiency measures will be applied where possible at the facility.

Ultra Low Sulphur Gasoil (ULSG) will be used at the facility for fuelling of mobile plant / forklifts, where necessary. If all mobile plant that will be used at the facility is to be fuelled by diesel, the approximate annual usage is anticipated to be 73,000 litres. However, the type and specification of mobile plant, such as forklifts, have not yet been finalised as these will be leased from an external organisation, so if electric mobile plant is opted for, the annual usage of ULSG will be less than this predicted amount.

Guidance has been taken from the GOV.UK website that outlines appropriate measures for WEEE permitted facilities and is outlined in Table 3-9 below:

Table 3-9 - Guidance on Energy Efficiency from WEEE Appropriate Measures for Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>An energy efficiency plan must be created and implemented at the facility that must:</p> <ul style="list-style-type: none"> ■ Define and calculate specific energy consumption of the activities being carried out and waste streams being treated; ■ Set annual key performance indicators (e.g. specific energy consumption in kWh/tonne of waste processed); and ■ Plan period improvement targets and related actions. 	<p>The site is considered to be a very low consumer of energy. Energy consumption on site will be metered via an all-site meter, however, a breakdown of figures will be maintained internally, so as to understand the energy consumption across the facility, within different areas of the process.</p> <p>Energy use will be monitored regularly by site management with regards to any anomalies.</p>	Yes
<p>As part of the facility's management system, the energy efficiency plan must be regularly reviewed and updated.</p>	<p>The site is considered to be a very low consumer of energy. Energy consumption on site will be metered via an all-site meter, however, a breakdown of figures will be maintained internally, so as to understand the energy consumption across the facility, within different areas of the process.</p> <p>Energy use will be monitored regularly by site management with regards to any anomalies.</p>	Yes
<p>An energy balance record must be held and maintained for the facility, providing a breakdown of energy consumption and generation (including any energy or heat exported) by the type of source (electricity, gas, conventional liquid fuels, and waste). Sankey diagrams or energy balances should be provided to show how energy is used in the waste treatment process.</p>	<p>Data on energy consumption will be broken down to understand consumption, as well as generation, in relation to solar panel supply. Information on the energy consumption of each process at the facility will also be available. Internal energy consumption at the facility will be monitored by plant: SMW deconstruction plant and the WTEE deconstruction plant.</p>	Yes
<p>The energy balance record should be regularly reviewed and updated as part of the facility's management system, alongside the energy efficiency plan.</p>	<p>Energy consumption on site will be metered via an all-site meter, however, a breakdown of figures will be maintained internally, so as to understand the energy consumption across the facility, within different areas of the process.</p> <p>Energy use will be monitored regularly by site management with regards to any anomalies.</p>	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
<p>There should be operating, maintenance and housekeeping measures in place in relevant areas, for example, for:</p> <ul style="list-style-type: none"> ■ Air conditioning, process refrigeration, and temperature exchange systems (leaks, seals, temperature control, evaporator or condenser maintenance); ■ The operation of motors and drives; ■ Compressed gas systems (leaks, procedures for use); ■ Steam distribution systems (leaks, traps, insulation); ■ Space heating and hot water systems; ■ Lubrication to avoid high friction losses; ■ Boiler operation and maintenance, e.g. optimising excess air; and ■ Other maintenance relevant to the activities within the facility. 	<p>Enva engineers on site will be supporting the housekeeping measures by following a preventative maintenance schedule across the facility, which will aid in ensuring there are no defects in equipment that could reduce the overall energy efficiency of the facility.</p> <p>The site does not include a boiler system, steam or space heating (apart from offices).</p>	Yes
<p>There should be measures in place to avoid gross energy inefficiencies, including, for example:</p> <ul style="list-style-type: none"> ■ Insulation; ■ Containment methods (e.g. seals and self-closing doors); and ■ Avoiding unnecessary discharge of heated water or air (e.g. by fitting simple control systems such as timers or sensors). 	<p>Recycling processes that will be undertaken at the facility will be contained within a building which will prevent gross energy inefficiencies with measures such as self-closing door systems.</p> <p>The site will not utilise space heating, steam or boiler systems and therefore there is little opportunity for energy wastage.</p> <p>All equipment is to be turned off when not in use.</p>	Yes
<p>Additional energy efficiency measures should be implemented at the facility as appropriate, following guidance on energy efficiency standards for industrial plants⁶.</p>	<p>Operation-related measures that will be implemented for energy efficiency include maintaining the stability and flow of the shredder feed to avoid gaps in feed. This will be explained in further in Table 3-10, below.</p>	Yes

BAT considerations in terms of the Waste Treatment BREF are detailed below (in Table 3-10) for the energy efficiency protocols that are to be employed at the Dartford facility. This allows arrangements to be assessed in relation to general waste facility measures.

⁶ <https://www.gov.uk/guidance/energy-efficiency-standards-for-industrial-plants-to-get-environmental-permits>.

Table 3-10 - BAT Requirements for Energy Efficiency from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangement	BAT?
<p>BAT 23: In order to use energy efficiently, BAT is to use both of the techniques given below: Energy efficiency plan Energy balance record</p>	<p>The site is a very low consumer of energy. Energy consumption on site will be metered via an all-site meter, however, a breakdown of figures will be maintained internally, so as to understand the energy consumption across the facility within different areas of the process.</p>	<p>Yes</p>
<p>BAT 28: In order to use energy efficiently, BAT is to keep the shredder feed stable. The shredder feed is equalised by avoiding disruption or overload of the waste feed which would lead to unwanted shutdowns and start-ups of the shredder.</p>	<p>Enva understands the importance of a steady shredder feed, in relation to energy efficiency. It is therefore considered as part of the mechanical treatment stages of the WTEE recycling plant and the SMW recycling plant. The shredder will not be run if there is insufficient material to be treated, which will be prevented through the plan to develop a buffer stock of WEEE to be recycled. It is anticipated that the rates of shredding, to ensure consistent and stable feeds, is 120 fridges per hour and 8 tonnes hour of SMW. It is a PLC-controlled system that monitors the throughput. A manual switch system will be available for instances where there is insufficient feed for the shredder to be used.</p>	<p>Yes</p>

3.3. EFFICIENT USE OF RAW MATERIALS AND WATER

Raw materials and fuels to be used at the proposed WEEE facility include fuel, nitrogen and various lubrications oils and additives (Table 3-11). These raw materials will be utilised in the various operations to be carried out on site. Storage and usage on site will be supported by containment measures. The raw materials discussed below are the most suitable options that Enva are to use in operations, however equivalent materials that offer the same properties may be incorporated in the future.

Table 3-11 - Raw Materials

Raw Materials and Fuel Description	Use of Material	Risks	Approximate Annual Usage	Environmental Impact (where known)	Suitable Alternative
Ultra Low Sulphur Gasoil, ULSG	Fuel	H226: Flammable liquid and vapour H304: May be fatal if swallowed and enters airways H315: Causes skin irritation H332: Harmful if inhaled H350: May cause cancer H373: May cause damage to organs (Bone Marrow, Hematopoietic System, Immune System, Kidney, Liver, Lungs, Skin, Blood) H410: Very toxic to aquatic life with long lasting effects	73,000 litres (dependent on mobile plant to be used)	Very toxic to aquatic life with long lasting effects. Diesel is considered biodegradable. Hydrocarbons may be degraded under aerobic conditions into metabolites that are less toxic and less bioaccumulative.	No better alternative – most appropriate material for activity.
Nitrogen under a low pressure	To provide an inert atmosphere throughout shredding stages of recycling.	H281: Contains refrigerated gas, may cause cryogenic burns or injury	Minimal	Diesel is considered biodegradable. Hydrocarbons may be degraded under aerobic conditions into metabolites that are less toxic and less bioaccumulative.	No better alternative – most appropriate material for activity.
Carter EP 220	Industrial gear oil	None - not classed as hazardous.	Minimal usage for maintenance purposes.	Harmful to aquatic life. Spills can cause extremely slippery surfaces. Should not be release into the environment.	No better alternative – most appropriate material for activity.



Raw Materials and Fuel Description	Use of Material	Risks	Approximate Annual Usage	Environmental Impact (where known)	Suitable Alternative
Mobil Rarus 425	Air compressor oil	None - not classed as hazardous.	Minimal usage for maintenance purposes.	No significant hazards. Not expected to be harmful to aquatic organisms.	No better alternative – most appropriate material for activity.
Ultramax 46	Hydraulic fluid / additive	None - not classed as hazardous.	Minimal usage for maintenance purposes.	No particular risk identified.	No better alternative – most appropriate material for activity.
Taurus Euro 10W-40	Lubricant / additive	None - not classed as hazardous.	Minimal usage for maintenance purposes.	No particular risk identified.	No better alternative – most appropriate material for activity.

The water consumption on site will be very low for welfare activities or spot washing/cleaning. There is no planned process of water. Water used on site will be supplied via mains supply and the usage is as below, in

Table 3-12. As the site is yet to be developed and there is no data available, this value provided is an estimate of water usage, assuming up to 50 employees on site at any one time, each contributing 60 litres / day. This is taken from British Waters’s Flows and Loads – 4⁷.

Table 3-12 - Water Usage

Source	Expected Use (litres / day)
Mains supply	3000

Table 3-13 and Table 3-14 below are the suggested measures for efficiency raw material use and water use, respectively, are outlined, from GOV.UK guidance and how this compares to the proposed arrangements on site.

Table 3-13 - Guidance on the Raw Material Use from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
A list of raw materials used at the facility and their properties should be maintained. This includes auxiliary materials and other substances that could have an environmental impact.	Table 3-11 outlines the raw materials to be used and stored on site.	Yes
The availability of alternative raw materials must be regularly reviewed, with those that are suitable and less hazardous, or polluting being used. This should include, where possible, substituting raw materials with waste or waste-derived products.	Raw materials would be subject to review every four years as part of the environmental permit when issued.	Yes
There must be justification of continued use of any substance for which there is a less hazardous alternative.	There will be a limited number of raw materials used at site. The main ones of which are ULSG for fuel, nitrogen for inerting in the deconstruction process and oils for lubrication. These are considered appropriate for use and alternatives would present the same hazard risk.	Yes
There must be quality assurance procedures in place to control the content of raw materials.	All raw materials in Table 3-10 are delivered in accordance with an EN specification.	Yes

⁷ [flows and loads bw cop 18..pdf](#)

Table 3-14 - Guidance on Water Use from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Measures to optimise water consumption must be taken to:</p> <ul style="list-style-type: none"> ■ Reduce the volume of water generated; and ■ Prevent or, where that is not practicable, reduce emissions to soil and water. 	<p>Water consumption at the facility will not be required for any recycling processes and water will only be required to supply welfare facilities and spot cleaning on site. Therefore, there are no opportunities for optimisation.</p>	<p>Yes</p>
<p>Measures taken must include:</p> <ul style="list-style-type: none"> ■ Implementing a water saving plan, involving establishing water efficiency objectives, flow diagrams and water mass balances; ■ Optimising the use of washing water, e.g. dry cleaning instead of hosing down, using trigger control on all washing equipment; ■ Recirculating and reusing water streams within the plant or facility, if necessary, after treatment; and ■ The use of water for vacuum generation, where relevant, e.g. using liquid ring pumps with high boiling point liquids. 	<p>No process water will be required for the activities that are to be carried out on site and so water efficiency measures will not be required for consideration as part of the facility development.</p>	<p>N/A</p>
<p>A regular review of water use (a water efficiency audit) must be carried out at least every 4 years.</p>	<p>No process water will be required for the activities that are to be carried out on site. Therefore, it is not considered necessary to undertake a water efficiency audit.</p>	<p>N/A</p>
<p>You must also:</p> <ul style="list-style-type: none"> ■ Produce flow diagrams and water mass balances for activities; ■ Establish water efficiency objectives and identify constraints on reducing water use beyond a certain level (usually this will be site specific); ■ Identify opportunities for maximising reduce and minimising use of water; and ■ Have a timetabled improvement plan for implementing additional water reduction measures. 	<p>No process water will be required for the activities that are to be carried out on site.</p>	<p>N/A</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<p>These general principles should be applied in sequence, in order to reduce water use and associated emissions to water:</p> <ul style="list-style-type: none"> ■ Use water efficient techniques at source, where possible; and ■ Reuse water within the process, by treating it first if necessary – if not practicable, use it in another part of the process or facility that has a lower water quality requirement. 	<p>No process water will be required for the activities that are to be carried out on site.</p>	<p>N/A</p>
<p>If uncontaminated roof and surface water cannot be used in the process, it should be kept separate from other discharge streams, at least until after the contaminated streams have been treated in an effluent treatment system and final monitoring has been carried out.</p>	<p>No process water will be required for the activities that are to be carried out on site.</p>	<p>N/A</p>
<p>Water quality requirements associated with each activity should be established and it should be identified whether water can be substituted from recycled sources. Where it is possible, include it in the improvement plan.</p>	<p>No process water will be required for the activities that are to be carried out on site.</p>	<p>N/A</p>
<p>Where there is scope for reuse (possible after some form of treatment), less contaminated water streams (such as cooling waters) should be kept separate from more contaminated streams.</p>	<p>No process water will be required for the activities that are to be carried out on site.</p>	<p>N/A</p>
<p>The volume of water used for cleaning and washing down should be minimised by:</p> <ul style="list-style-type: none"> ■ Vacuuming, scraping or mopping in preference to hosing down; ■ Reusing wash-water (or recycled water) where practicable; and ■ Using trigger controls on all hoses, hand lances and equipment. 	<p>No process water will be required for the activities that are to be carried out on site.</p>	<p>N/A</p>
<p>Fresh water consumption must be directly measured and recorded regularly at every single usage point, ideally on a daily basis.</p>	<p>No process water will be required for the activities that are to be carried out on site. All water consumption at the facility will be for welfare facilities, and therefore, consumption will be monitored.</p>	<p>N/A</p>

It is important for Waste Treatment BAT to be considered as well as Appropriate Measures for WEEE Permitted Facilities – these are outlined below, in Table 3-15, alongside the anticipated arrangements.

Table 3-15 - BAT Requirements for Consumption Monitoring and Material Efficiency from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangement	BAT?
<p>BAT 11: BAT is to monitor the annual consumption of water, energy and raw materials as well as the annual generation of residues and waste water, with a frequency of at least once per year.</p> <p>Monitoring includes direct measurements, calculation or recording, e.g. using suitable meters or invoices. The monitoring is broken down at the most appropriate level (e.g. at process or plant/installation level) and considers any significant changes in the plant/installation.</p>	<p>Consumption of water on site will be monitored via invoices from supply. No process water will be required for the activities that are to be carried out on site.</p> <p>Energy consumption will be monitored by an all-site meter, however a breakdown of figures will be conducted internally, so as to gain understanding of the energy consumption.</p>	Yes
<p>BAT 22: In order to use materials efficiently, BAT is to substitute materials with waste.</p> <p>Waste is used instead of other materials for the treatment of wastes (e.g. waste alkalis or waste acids are used for pH adjustment, fly ashes are used as binders).</p> <p>Some applicability limitations derive from the risk of contamination posed by the presence of impurities (e.g. heavy metals, POPs, salts, pathogens) in the waste that substitutes other materials. Another limitation is the compatibility of the waste substituting other materials with the waste input (see BAT 2).</p>	<p>This is not applicable to the activities carried out at the facility.</p>	N/A

3.4. AVOIDANCE, RECOVERY AND DISPOSAL OF WASTES

Due to the nature of the processes carried out on site, there will be a range of residual materials that arise from the WTEE and SMW recycling processes that will require further treatment or disposal at an alternative waste treatment facility. These materials will be stored on site, prior to being transferred to relevant external facilities. Such materials will be collected as a result of the destruction of various WEEE carcasses.

Table 3-16 - Residual Materials from Stage 1 and Stage 2 of WTEE Treatment

Residual Materials	Waste Category	Storage Capacity	Storage Timeframe
Compressor Oil	13 02 08*	12 x 350 litre drums	3 months
Refrigerants	14 06 01*	12 x 205 litre drums or one 25,000 litre iso tank	3 months
HC Refrigerants	14 06 03*	12 x 205 litre drums or one 25,000 litre iso tank	3 months

Residual Materials	Waste Category	Storage Capacity	Storage Timeframe
Blowing Agent	14 06 01*	12 x 205 litre drums or one 25,000 litre iso tank	3 months
Polyurethane (PUR) Foam	19 12 04	192 tonnes	6 months
Ferrous Metal	19 10 01	100 stillages	6 months
Non-Ferrous Metal	19 10 02	100 stillages	6 months
Plastic and Rubber	19 12 04	30 stillages	12 months
Mercury Switches	19 10 05*	30 stillages	12 months
Others	19 10 06	30 stillages	12 months

Table 3-17 details the waste generated from the SMW treatment.

Table 3-17 - Residual Materials from Other e-Waste Treatment

Residual Materials	Waste Category	Storage Capacity	Storage Timeframe
Ferrous Metal	19 10 01	N/A as collected by trailers and dispatched	6 months
Non-Ferrous Metal	19 10 02	N/A as collected by trailers and dispatched	6 months
Plastic	19 12 04	30 stillages	12 months
Others	19 10 06	30 stillages	12 months

Table 3-18 details the measures in place at the installation to minimise waste generation where practicable. In accordance with the Waste Hierarchy, Enva aims to recycle as much material as possible. This means that 90% of incoming WEEE will be able to be recycled at the facility, with the remaining 10% being dispatched elsewhere, to other waste treatment facilities, for further treatment or disposal.

Table 3-18 - Guidance on Waste Minimisation, Recovery and Disposal from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>A residues management plan must be implemented that:</p> <ul style="list-style-type: none"> Minimises the generation of residues arising from waste treatment; 	<p>An explicit residues management plan is not necessary for this facility as the recycling processes that will be carried out involve the breakdown of WEEE and subsequent separation of fragments. Such fragments will be transferred to relevant waste treatment facilities for further</p>	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> Optimises the reuse, regeneration, recycling or energy recovery from residues, including packaging; and Makes sure that residues are properly disposed of where recovery is technically or economically impractical. 	treatment or disposal. The Waste Hierarchy is to be applied by Enva, which aligns with the appropriate measures relating to the optimisation of reuse, regeneration or recycling of residues.	
Where waste must be disposed of, a detailed assessment must be carried out, identifying the best environmental options for waste disposal.	Separated fragments of residual material as a result of recycling processes on site are transferred to the relevant waste treatment facilities for appropriate treatment or disposal, where applicable.	Yes
<p>A review of options for recovering and disposing of waste produced at the facility must be carried out on a regular basis. This must be done as part of the management system, to make sure that:</p> <ul style="list-style-type: none"> The best environmental options are still used; and The recovery of waste is promoted where technically and economically viable. 	Separated fragments of residual material as a result of recycling processes on site are transferred to the relevant waste treatment facilities for appropriate recovery in line with the waste hierarchy.	Yes

Table 3-19 details how the site meets the Waste Treatment BAT conclusion requirements for the reuse of packaging. It is not anticipated that Enva will receive large volumes of packaging with incoming WEEE loads, however, the details for handling any packaging that is accepted at the facility are outlined below.

Table 3-19 - BAT Requirements for Reuse of Packaging from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangement	BAT?
<p>BAT 24: In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging, as part of the residues management plan (see BAT 1).</p> <p>Packaging (drums, containers, IBCs, pallets, etc.) is reused for containing waste, when it is in good condition and sufficiently clean, depending on a compatibility check between the substances contained (in consecutive uses). If necessary, packaging is sent for appropriate treatment prior to reuse (e.g. reconditioning, cleaning).</p>	Enva receives packaging from retailers, which often includes cardboard and polystyrene (EPS). This is to be manually sorted into skips before mechanical compaction and recovery off-site	Yes

4. INSTALLATION OPERATIONS

4.1. OVERVIEW OF SECTION

The following Sections provide an overview of the operations and processes that are proposed to be undertaken by Enva at the new WEEE recycling facility in Dartford. As detailed in earlier sections of this report, activities to be carried out on site will be almost identical in scale and nature to the Grantham site operated by Enva.

4.2. OVERVIEW OF OPERATIONS

Comprising one large unit for recycling activities, along with associated storage areas (as identified in Figure 2-2), the site is proposed to accept WEEE products that include fridges, freezers, cookers and small domestic appliances (SDA) for refurbishment and reuse, or recycling where reuse is not possible. In order to process WTEE (consisting only of fridges and freezers), the initial stage involves degassing, which is known as stage 1 pre-destruction. This is followed by stage 2 destruction, entailing shredding and fraction segregation. For recycling of SMW (including display screen equipment), a manual dismantling process is required and the removal of components that contain hazardous substances, where necessary. Waste SMW then undergoes shredding and separation into fractions for recovery.

It is the intention that activities to be carried out on site include the physico-chemical treatment of hazardous waste, as well as the temporary storage of hazardous waste for recovery. Furthermore, it is anticipated that the site will treat and temporarily store, for recovery, non-hazardous WEEE, as part of waste operations.

4.3. OPERATING PROCESSES – RECEIVED WASTE, STORAGE AND PROCESS DETERMINATION

All incoming waste at the facility is to be inspected for conformance with 'permitted waste'. If accepted, the waste will be directed to the appropriate treatment. In accordance with the Hazardous Waste Regulation (2011), Enva will apply the Waste Hierarchy to ensure that recycling is maximised as far as possible and that residual materials that require disposal are minimised.

All recycling operations are to occur inside the warehouse, with any external storage of unprocessed WEEE and recycled materials only allowed on an impermeable surface, with accompanying sealed drainage and where water containment features are in place to prevent the risk of water escaping onto unmade ground. All fractions arising from WTEE recycling can be stored within the main building, however fractions arising from SMW recycling are to be stored externally (within suitable areas), due to the risks that these materials pose.

4.3.1. WASTE PRE-ACCEPTANCE

Prior to waste being received on-site, Waste Pre-Acceptance agreements shall be completed by customers to facilitate the identification of the following information:

- If the waste can be accepted under the permitted waste types;
- The expected quantities of waste, to ensure that there is sufficient capacity, prior to accepting;
- The source of the waste, to ensure reporting to regulatory authorities is accurate and evidence has been allocated correctly;

- Details of the waste in regard to Persistent Organic Pollutants (POPs);
- Verification of the waste holder;
- Confirmation of the customer’s agreement with the General Terms for the acceptance of WEEE; and
- Any supporting documents provided by the customer to demonstrate that they are authorised to enter into the terms of the agreement and be bound by them.

The pre-acceptance process (arrangements for which are discussed in Table 4-1) will be essential in ensuring the efficiency of processes and prevention of issues arising.

Table 4-1 - Guidance on Waste Pre-Acceptance from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Except in the case of small one-off deliveries of WEEE, for example from tradespeople, waste pre-acceptance procedures must be implemented so that enough is known about the waste before it arrives at the facility. This needs to be done to assess and confirm the waste is technically and legally suitable for the facility. The procedures must follow a risk-based approach, considering:</p> <ul style="list-style-type: none"> ■ The source and nature of the waste; ■ Any hazardous properties and persistent organic pollutant (POPs) content; ■ Potential risks to process safety, occupational safety and the environment (e.g. from the presence of hazardous substances that could be dispersed during treatment); ■ Knowledge about the previous waste holder; and ■ The type of containment used for the waste. 	<p>Prior to waste being received on-site, Waste Pre-Acceptance agreements shall be completed by customers to facilitate the identification of the following information:</p> <ul style="list-style-type: none"> ■ If the waste can be accepted under the permitted waste types; ■ The expected quantities of waste, to ensure that there is sufficient capacity, prior to accepting; ■ The source of the waste, to ensure reporting to regulatory authorities is accurate and evidence has been allocated correctly; ■ POPs details of the waste; ■ Verification of the waste holder; ■ Confirmation of the customer’s agreement with the General Terms for the acceptance of WEEE; and ■ Any supporting documents provided by the customer to demonstrate that they are authorised to enter into the terms of the agreement and be bound by them. 	Yes
<p>The following information must be obtained in writing when a customer query is received:</p> <ul style="list-style-type: none"> ■ Details of the waste producer (who the waste is being received from), including organisation name, address and contact details; ■ Where the waste is coming from; ■ Full description of the waste including quantity; 	<p>As detailed above, agreements between customers and Enva shall be carried out prior to waste being received on site. Such agreements will address information in relation to the waste proposed to be sent. If customers wish to bring any additional waste types, a new waste pre-acceptance agreement must be completed.</p> <p>Waste pre-acceptance agreements may relate to multiple loads but are renewed annually.</p>	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ■ The List of Waste cost (European Waste Classification, EWC, code); ■ Any hazardous properties or present of any regulated chemicals, e.g. POPs; ■ If WEEE identified as POPs waste in the guidance on how to classify WEEE⁸ is described as not being a POPs waste, evidence should be requested of the assessment demonstrating this; and ■ With reference to Annex VII of the WEEE Directive⁹, details of any treatment undertaken. <p>Pre-acceptance information can be verified by contacting or visiting the waste producer. Dealing with staff directly involved in waste production can help to fully characterise a waste.</p>	<p>Waste Transfer Notes are received with inbound vehicles, noting the carrier and source of shipment of WEEE. Signing of such documents designates official transfer of waste ownership to Enva. If the inbound load contains hazardous material within the WEEE to be delivered, a Consignment Note is provided instead of a Waste Transfer Note, stating waste type, relevant hazard codes, EWC codes and the origin of WEEE collected. As above, details of the load will be confirmed with the driver.</p> <p>All SMW received is assumed to be POPs waste and is treated as such, in line with the standard.</p>	
<p>It should be considered, with the customer, whether the WEEE is suitable for preparing for reuse. Where that remains a possibility, it should be ensured that the WEEE is handled and transported with care to avoid any damage or loss that could affect reuse.</p>	<p>In line with the Waste Hierarchy, Enva recycle as much of an incoming load as possible (90%) with the remaining (10%) materials being transferred to other waste treatment facilities for further treatment or suitable disposal.</p>	Yes
<p>Confirmation must be obtained that the WEEE does not contain a radioactive source other than domestic smoke detectors and specialist lamps such as xenon lamps. If there is a risk of radioactive contamination (e.g. in certain types of medical equipment) confirmation must be obtained that the waste is not radioactive, unless the facility is permitted to accept such waste.</p>	<p>Details on the types of WEEE being received from customers is to be determined as part of the pre-acceptance agreement, enabling Enva to handle and treat the WEEE appropriately.</p> <p>Any WEEE containing radioactive substances (e.g. ionization smoke detectors) are to be removed prior to mechanical treatment on site. Medical equipment could form part of the waste to be accepted at the facility; however, pre-acceptance agreements will ensure that Enva are fully aware of the inbound waste loads and their contents. Medical equipment will need to be pre-treated before being accepted for treatment at the Dartford facility.</p>	Yes

⁸ <https://www.gov.uk/how-to-classify-different-types-of-waste/electronic-and-electrical-equipment>.

⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02012L0019-20180704&from=EN>.

Requirements	Proposed Arrangements	Appropriate Measure?
<p>It must be considered whether specific wastes, from among those permitted to receive, have properties that can pose unacceptable risks to the site or process. For example, due to:</p> <ul style="list-style-type: none"> ■ A risk of explosion (e.g. from gas or aerosol canisters that may be present); or ■ A risk of fire (e.g. from WEEE containing lithium-ion batteries). <p>Establish a list of such wastes and procedures for managing the risks from them.</p>	<p>Among the wastes that will be received at the facility, wastes such as gas cannisters and ink cartridges pose a risk of explosion or fire.</p> <p>Procedures for managing such risks have been developed and relevant Enva operators will be aware of the protocols. Such procedures include removal of gas cannisters and batteries (along with any other components that cannot be recycled) as part of pre-treatment procedures. Further to this, for all WTEE, doors will be opened for removing shelving, for example, which will ensure that any potential unexpected items or contaminants identified inside the appliance can be removed. Artificial intelligence (AI) cameras also will form part of the built-in system of the recycling plant, trained to identify any potential contaminating items that should have been removed as part of pre-treatment procedures.</p>	<p>Yes</p>
<p>Pre-acceptance records following receipt of the waste must be kept. If an enquiry from a waste producer does not lead to the receipt of waste, records do not need to be kept.</p>	<p>Following agreement of terms, customer details and Waste Pre-Acceptance details will be entered onto the Central ERP system, 'Tegos'.</p>	<p>Yes</p>
<p>Information required at the pre-acceptance must be reassessed if the:</p> <ul style="list-style-type: none"> ■ Waste changes; ■ Process giving rise to the waste changes; or ■ Waste received does not conform to the pre-acceptance information. 	<p>A 'contract' is formulated for the customer, once terms agreements are in place, specifying the material types the customer is authorised to deliver to the site. A new Waste Pre-Acceptance Agreement will need to be completed if the customer wishes to deliver additional waste types.</p>	<p>Yes</p>
<p>In all cases, information required at pre-acceptance must be reassessed on an annual basis.</p>	<p>Waste pre-acceptance agreements may be related to multiple loads but are to be renewed annually.</p>	<p>Yes</p>
<p>The information required, and the assessment made at the pre-acceptance stage is to make sure:</p> <ul style="list-style-type: none"> ■ Only wastes suitable for the site are accepted; ■ Unnecessarily accumulating waste is avoided; and 	<p>Prior to any waste being received from any customers, the Waste Pre-acceptance procedure is to be completed (by customers) in full, to provide information to ensure that:</p> <ul style="list-style-type: none"> ■ The waste can be accepted under the permit; 	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ There is enough storage and treatment capacity available. 	<ul style="list-style-type: none"> ▪ There is sufficient capacity (both in terms of storage and treatment); and ▪ The waste will not be unnecessarily accumulating. 	

4.3.2. WASTE ARRIVAL

Upon arrival at the facility, waste transportation paperwork will be inspected, which will comprise of a Waste Transfer Note for non-hazardous waste, or a Hazardous Waste Consignment Note for inbound loads containing Hazardous Material. This information will be valuable in ensuring that waste is dealt with effectively throughout the processes on-site and enable the correct procedures to be adhered to, in order to maintain environmental protection.

Other documents that will also form part of the arrival process are the Unit Count Sheet and the Weighbridge Slip. These are particularly important for the administrative aspects of the processes but are also key in supporting the process determination procedures and reporting. Weighbridge staff will be responsible for ensuring that the following information is obtained for the completion of the weighbridge slip: the gross weight of the inbound vehicle (including load), the empty weight of the vehicle (once goods have been unloaded), and the net weight calculated by the deduction of the empty weight from the gross weight.

4.3.3. WASTE ACCEPTANCE

Enva will capture data relating to the waste being accepted on-site through a waste acceptance procedure (further details included in Table 4-2), which will enable reporting obligations to be fulfilled. The procedure involves unique barcodes in a tracking system, which is outlined in later sections of this document (Section 4.5).

Unloading and handling of waste must be conducted in such a way so as to minimise damage, and to maximise reuse, particularly when dealing with fridges, which should be handled by clamping them by their sides. This will also minimise the risk of emissions. Any damaged items will be directed to the WTEE processing line immediately, rather than storage, and recycled as soon as possible. Further to this, offloading will be onto an impermeable surface with associated sealed drainage in order to prevent environmental contamination should a leak or spillage occur from the waste being handled – further details regarding the storage of accepted waste is provided below. The types of waste that are to be accepted on site are detailed in the below section (4.4).

Table 4-2 - Guidance on Waste Acceptance from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Waste acceptance procedures must be implemented to check that the characteristics of the waste received matches the information obtained during waste pre-acceptance. If it is not, it must be confirmed that it can be accepted as non-conforming waste, or it must be rejected. If hazardous waste is being rejected, guidance on the procedure for rejecting hazardous waste¹⁰ must be followed. Procedures must be documented and auditable.</p>	<p>Upon arrival of WEEE at the site, protocols will be in place to ensure that the anticipated WEEE matches that received. Backing documents are checked and managed by weighbridge staff for inbound and outbound vehicles from the site. A record of inbound vehicles is maintained, alongside carrier details and source of shipment. A Waste Transfer Note will be signed to verify delivery as well as designating official transfer of waste ownership to Enva. If the inbound load contains hazardous material, a Consignment Note is used (in place of a Waste Transfer Note), stating waste type, relevant hazard codes, EWC codes and the origin of WEEE collected. Drivers delivering loads will verify load details on both a Waste Transfer Note and a Consignment Note.</p> <p>Further details of each load received will be documented during the unloading process and outlined in the unit count sheet, validated against vehicle weight changes measured by the weighbridge. Such additional details are to be logged in Tegos for subsequent reporting and invoicing.</p> <p>Weighbridge slips / tickets are also essential in ensuring that information is filed relating to inbound, outbound and net vehicle weights, categories of waste and their relevant weight and number of units.</p> <p>Waste that does not conform to specified agreements will be segregated and photographed. A procedure for controlling non-conforming wastes will be incorporated into the site's management system.</p>	<p>Yes</p>
<p>Procedures must follow a risk-based approach, considering:</p> <ul style="list-style-type: none"> ■ The source, nature, condition and age of the waste; ■ Any hazardous properties of the waste; ■ Any POPs content in the waste; 	<p>Using the information gathered as part of the pre-acceptance of waste and arrival on site, details of WEEE being accepted will be logged and verified so as to ensure the appropriate handling is carried out. Specific protocols will be employed on site, reliant on count sheets assigned to each</p>	<p>Yes</p>

¹⁰ <https://www.gov.uk/guidance/hazardous-waste-rejected-loads-supplementary-guidance>.

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ■ Potential risks to process safety, occupational safety and the environment (e.g. the presence of lithium-ion batteries); and ■ Knowledge about the previous waste holders. 	<p>consignment, so as to ensure that the correct handling is undertaken.</p> <p>It is to be assumed that the only compartment of WTEE that could contain POPs waste is the compressor, which will be removed. SMW is assumed to contain POPs waste, and so this is embedded in the operations to be undertaken in relation to SMW recycling: SMW plastics are considered to be POPs waste. POPs waste will be dispatched to an alternative waste treatment facility, dedicated to plastics. Storage arrangements will also have consideration for this: SMW plastics will be stored under weatherproof covering, to prevent leachate into surface water run-off.</p>	
<p>If, in the case of small, one-off deliveries of WEEE (e.g. those from tradespeople), pre-acceptance information has not been received, the load must be fully assessed to make sure it is technically and legally suitable for the process.</p>	<p>All incoming loads will require customers to complete pre-acceptance agreements stipulating all inbound materials that can be anticipated.</p>	Yes
<p>Each load of waste should be weighed on arrival to confirm the quantities against the accompanying paperwork, unless alternative reliable systems are available (e.g. based upon volume). The weight must be recorded in the waste tracking system.</p>	<p>Upon arrival of an inbound load, a unit count sheet will be employed to generate additional details (to the Waste Transfer Note or Consignment Note) – this, completed by those unloading the trailer, will be compared to information already obtained in relation to the nature of the load, and validated against vehicle weight changes as measured by the weighbridge. Details will be stored on Tegos, useful in future reporting and invoicing.</p>	Yes
<p>Wastes must be visually checked and verified against pre-acceptance information and transfer documentation before acceptance onto site.</p>	<p>During unloading, those unloading will verify the contents of the inbound trailer in respect to the expected WEEE to be received, based on pre-acceptance agreements and consignment note. Validation against weighbridge changes as part of the unit count sheet completion will support verification of the waste.</p>	Yes
<p>All transfer documentation must be checked and validated, and all discrepancies must be resolved before the waste is accepted. If the incoming waste classification and description is believed to be incorrect or incomplete, this must be addressed with the customer during waste acceptance. Non-conformances must be</p>	<p>Waste Transfer Notes and Consignment Notes (when the inbound load contains hazardous material) will be utilised to designate official transfer of waste ownership to Enva, as well as stating the waste type, hazard codes, EWC codes and origin of WEEE collected, where relevant.</p>	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
<p>recorded. If the waste is assessed as acceptable for on-site storage or treatment, this must be documented.</p>	<p>Quantities and nature of waste being accepted is confirmed by unloaders, during the completion of the unit count sheet. Multiple consignments per load from different task sites require their own count sheets to ensure integrity of the acceptance process and transparency in terms of the WEEE received, against the information obtained prior.</p> <p>Waste which does not conform to specified agreements is to be segregated and photographed, in order to record the non-conformance.</p>	
<p>Clear criteria must be used to reject non-conforming wastes. There must also be a written procedure for recording, reporting and tracking non-conforming wastes, including notifying the relevant customer or waste producer to prevent reoccurrence.</p>	<p>Wastes that do not comply with the EWCs outlined in Section 4.4 of this report will not be accepted on site and will be classed as non-conforming wastes. All non-conforming wastes will be segregated, and the relevant consignor will be contacted to be made aware of the non-conformity. Collection of the non-conforming waste will be arranged with the consignor. Procedures for controlling non-conforming waste at the facility will be embedded into the site's management system.</p>	Yes
<p>The person carrying out waste acceptance checks must be trained to effectively identify and manage any non-conformances in the loads received, complying with this guidance and permit conditions.</p>	<p>Appropriate task-specific training is to be provided.</p>	Yes
<p>If there is a known risk of contamination other than the presence of smoke detectors and certain specialist lamps such as xenon lamps, the waste must be checked to determine that it does not include radioactive material unless the site is permitted to accept that type of radioactive waste.</p>	<p>Inbound waste is checked to ensure that what is received aligns with pre-acceptance agreement information. Enva will be fully aware of all waste arriving and being accepted on to site, enabling removal of radioactive wastes prior to feeding into the shredder. There is therefore no further need for radioactive detection systems to be installed at the weighbridge.</p>	Yes

4.3.4. RECEIVED WASTE STORAGE

As a result of seasonal fluctuations, ad-hoc retailer promotional activity and daily fluctuations driven by vehicles returning to site, volumes of waste received is impacted. In order to account for this, storage of WEEE will be required in instances where inbound flows exceed the process capacity, particularly as there will be limited processing flexibility inherent in the recycling processes at Dartford. Storage will be on a temporary basis, prior to processing, and will be in line with stipulations under the FPP (Appendix H) and HSE requirements, which include:

- No waste shall be stored for a period greater than that outlined above and this will be supported by a programme stock rotation, monitored via photographic evidence;
- Free storage of refrigeration units shall not exceed a maximum of 2.6 m in height (to allow for 1 m freeboard space above the pile);
- Items containing POPs shall be stored under weatherproof covering (SMW contains POPs will be stored externally within bunkers);
- Storage of waste will adhere to agreed maximum pile sizes and a 6 m gap, or a concrete fire wall shall separate piles;
- In order to prevent fire spread, a 60 cm free space is to be accounted for between the top of the waste and the top of the wall;
- Clear labelling of storage bays will be implemented to identify materials and hazards;
- WEEE products containing high quantities of batteries will remain in original packaging until batteries are removed;
- Lead acid batteries will be stored in containers with an impermeable acid-resistant base and a lid to prevent water ingress;
- A bunker will be used to store SMW external to the main building;
- Forklift trucks and road going vehicles will not be permitted to park in storage locations, so as to prevent fire risk;
- No hot works to be undertaken in storage locations, to prevent fire risk;
- Batteries will be stored in leak-proof containers and stored in a designated battery container; and
- Items are to be stored in a way to minimise breakage or damage that could lead to emissions.

Volumes of inbound WEEE will be monitored via the site management team to enable proactive management to prevent volumes exceeding site capability. Unprocessed WTEE will be predominantly stored inside the factory, with associated overflow storage areas designated. All SMW will be stored outside in designated bunkers.

Waste acceptance at the facility and the relevant protocols are outlined below in Table 4-3.

Table 4-3 - Guidance on Waste Acceptance - Storage Areas from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
All relevant storage areas (quarantine, reception and general) and treatment processes in the facility must have the physical capacity needed for the waste received. Wastes must not be received if this capacity is not available. The amount of waste received must also comply with storage limits in the permit.	Volumes of inbound waste are to be monitored under site management responsibilities, reviewed on a weekly basis within meetings involving company directors. This will enable proactive management to ensure that site capabilities will not be exceeded. The Site Manager will be responsible for completing an inventory of stock, enabling control of stock.	Yes
The waste offloading, reception and quarantine areas must be impermeable surfaces with a sealed drainage system. This system must collect all surface water run-off and channel it to a blind sump, unless it can be lawfully discharged.	Waste will be offloaded on an impermeable surface with sealed drainage.	Yes
Materials reception area(s) must be clearly designated. Staff controlling the inspection, reception and validation of materials at the facility must be trained in their respective roles.	Incoming SMW shall be stored in designated storage bays, in a safe way. Incoming WTEE is likely to be directed straight into processing stage, however there will be areas for storage if immediate recycling is not possible. Overflow storage areas will be designated in preparation for peak periods – these are detailed in the site plan.	Yes
Quarantine areas must be established for WEEE materials that are prohibited, awaiting full inspection, or waiting assessment or removal.	The site will have in place a dedicated quarantine area.	Yes
Quarantine storage must be for a maximum of fourteen working days.	All quarantined wastes will be moved off-site within 14 days.	Yes
Written procedures must be in place for dealing with wastes held in quarantine, and a maximum storage volume. For some limited and specific cases (e.g. detection of radioactivity), quarantine storage time can be extended if the EA agrees.	Written procedures will be included the site's management system in relation to handling of wastes held in the quarantine area. Enva will implement such procedures (similar to those used at other Enva facilities) that define the circumstances under which quarantine areas can be used, what is to be stored in these areas, and the actions required for removal from quarantine areas. It is not expected that quarantine areas will be used in any instance other than fire or similar incident, as Enva will be fully aware of the waste arriving on site.	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
Quarantine storage must be separate from all other storage and clearly marked as a quarantine area.	The quarantine area is separate to other waste storage and will be clearly marked as such.	Yes

The arrangements for waste storage, segregation and the handling of waste that will be implemented on site are detailed in Table 4-4 below. WEEE at the facility will be supported by suitable storage areas, so as to reduce the handling required. Residual materials arising from recycling activities will be separated and stored in designated areas, pending dispatch.

Table 4-4 - Guidance on Waste Storage, Segregation and Handling from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
The facility should be designed and operated in a way that minimises the handling of waste. Waste handling must be carried out by competent staff using appropriate equipment.	<p>The design of the facility will account for minimising the handling of waste and ensuring the most efficient processes can occur on-site. The overall process will involve unloading of WEEE, ensuring separation into relevant streams, which will then be followed by the WEEE entering the recycling process. There will be minimal handling required for this procedure as the recycling system is fully automated, so handling of the WEEE is not necessary, once treatment activities have been initiated.</p> <p>In the case of SMW, a pre-sorting process will be undertaken (outside of the building): the purpose of this is to remove batteries and related items that could contaminate waste streams downstream or pose other risks, such as fire or explosion if they were to enter the recycling treatment process. Following this, recycling processes, including shredding, are to be initiated. As WTEE is unlikely to contain such items, this pre-sorting measure is not required as part of their recycling treatment.</p>	Yes
Where possible, storage areas should be located away from watercourses and sensitive perimeters.	Storage areas are away from watercourses and sensitive perimeters.	Yes
All waste must be stored within the security protected area of your facility to prevent unauthorised access and vandalism.	The whole site will be secure from unauthorised access. Weighbridge staff will be in operation at all times, to control access of any vehicles on site. CCTV will be in operation, which is monitored at all	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
	times by an external third-party security contractor, alongside an alarm system.	
Establish the maximum storage capacity of the site and designated storage areas and these maximum capacities must not be exceeded.	The maximum storage capacity of the site and designated storage areas will be detailed on appropriate plan and at the point of storage.	Yes
Capacity must be defined in pile sizes as well as tonnage. The quantity of waste stored within the designated areas must be regularly monitored to check against the allowed maximum capacity. The quantities and pile sizes must also be monitored against those set out in the FPP.	Capacity will be determined both in size and tonnage.	Yes
Where relevant, the Health and Safety Executive (HSE) guidance and standards ¹¹ must be conformed to.	All HSE guidance will be adhered to in accordance with good business practice.	Yes
Waste must not be accumulated unnecessarily. Generally, all wastes must be removed within a maximum of 6 months of receipt. If a shorter time period is given in a permit condition or one is specified in the FPP, that condition must be complied with.	Wastes will be removed from the facility at regular intervals, in line with those outlined above in Section 3.4, to prevent unnecessary accumulation and also ensure that all waste is treated or disposed of in the most appropriate way, which will often involve transfer to an external waste treatment facility. The collection of wastes at regular intervals will align with requirements as outlined in the FPP in particular.	Yes
All waste must be stored in a way that allows easy inspection. Safe access must be maintained between piles of wastes. There must always be pedestrian and vehicular access (e.g. forklift) to the whole of the storage area.	Within the design of the site, accessibility of storage areas has been considered, so as to ensure that vehicular and pedestrian access will always be available.	Yes
Waste must be stored and handled in a way that prevents pests and vermin. Specific measures and procedures must be in place to identify and manage any wastes that are causing pests or vermin at the site.	Due to the nature of the waste to be accepted and stored on site, there should be very little material on site that would be likely to attract pests. Despite this, the factory will be totally covered and enclosed so as to prevent pests. Management of rodent or insect infestation is to be undertaken by a site pest control contractor.	Yes

¹¹ <https://www.hse.gov.uk/waste/index.htm>.

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Waste storage areas and stored equipment must be subject to frequent inspection to make sure that any leaks, spillages of liquids, dust or loose material are identified and managed appropriately, and fire breaks are maintained. Written records of inspections must be kept. Any spillages of waste must be rectified and logged.</p>	<p>Enva engineers follow a preventative maintenance schedule and inspection programme to cover the site, with any inspections and actions documented and recorded. The preventative maintenance schedule works with the operation schedule to prevent the need for shutdown to perform maintenance.</p> <p>Records of any instance of spillage will be documented and maintained.</p> <p>Enva's engineers' preventative maintenance schedule involves inspections on recycling equipment, buildings and site infrastructure, including impermeable surfaces and bunding walls / kerbs. Repairs are also carried out on an ad hoc basis in the event of a breakdown. Inspections, repairs and preventative maintenance will be documented by Enva engineers. As demonstrated in the organogram (in Figure 3-1), a shift engineer will be available for every shift, to carry out preventative maintenance, undertake repairs and respond to breakdowns.</p>	<p>Yes</p>
<p>Activities that represent a clear fire risk must not be carried out within any storage area. Examples include:</p> <ul style="list-style-type: none"> ■ Grinding; ■ Welding or brazing of metalwork; ■ Smoking; ■ Parking of normal road vehicles except while unloading or loading; and ■ Recharging forklift truck or power tool batteries. 	<p>No hot works are to be undertaken in storage locations in order to prevent the risk of fire.</p> <p>Parking of forklift trucks, as well as road-going vehicles, is not to be permitted in locations designated for storage, to prevent fire risk.</p>	<p>Yes</p>
<p>Areas of the site where explosive atmospheres could occur should be assessed. Where appropriate these must be classified into hazardous zones in accordance with the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)¹².</p>	<p>There are not considered to be any areas where explosive atmospheres occur on site. All areas are contained and therefore there should not be explosive atmosphere risks.</p>	<p>N/A</p>

¹² <https://www.hse.gov.uk/fireandexplosion/dsear.htm>.

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Outdoor waste storage areas must have an impermeable surface with a sealed drainage system. It must collect all surface water run-off and channel it to a blind sump unless it may be lawfully discharged.</p>	<p>As the impermeable floor surface will be freshly laid to a high standard, there is a very low risk of any spillage leaching and a low risk of spillage reaching surface water drainage systems.</p>	<p>Yes</p>
<p>Indoor waste storage areas must have an impermeable surface and spillage collection facilities must be provided.</p>	<p>Storage of unprocessed material is primarily expected to remain inside the building.</p>	
<p>Weatherproof covering must be used to store any items that may be reused as whole appliances or may have components recovered from them for reuse. The type of covering will depend on the types and quantities of waste but must ensure the WEEE is protected from the weather. It could be as simple as a lid of cover over a container for small items, but in other cases may require the construction on a roofed building.</p>	<p>Storage of unprocessed material is primarily planned inside the building and materials held externally will be stored in the designated covered bays.</p> <p>Reuse procedures are not to be undertaken at the facility, however, storage areas will be suitable for storage of WEEE prior to initiation of treatment.</p> <p>Upon receipt of incoming WEEE loads, once acceptance procedures have been fulfilled, WTEE is likely to be transferred straight into the recycling process. SMW may be stored in designated areas, under weatherproof covering, pending the pre-treatment picking process (in which potential contaminating components are to be removed). Alternatively, SMW may enter the process straightaway.</p>	<p>Yes</p>
<p>Weatherproof covering must be used in areas for storage of waste containing hazardous material or fluids where this is necessary to avoid contamination of surface water. This includes, but is not necessarily limited to, the storage of:</p> <ul style="list-style-type: none"> ■ Lamps and processed fractions; ■ Flat panel display equipment which may contain cold-cathode fluorescent lamp (CCFL) backlights and where these are processed by shredding, the shredded fractions; ■ Broken cathode ray tubes (CRT) and CRT glass; and ■ Shredded WEEE or plastic containing fractions that may be POPs waste. 	<p>Fractions of material arising from the SMW recycling plant will be stored under weatherproof covering, to prevent harm to the water environment. This is due to the potential that it may contain POPs.</p>	<p>Yes</p>
<p>Covering may still be required even if you have a consent to discharge surface water to sewer or if water is tankered away. For example, to avoid leached chemicals such</p>	<p>Weatherproof covering will be implemented in areas for storage of fragments arising from SMW recycling processes, due to the risk of POPs leaching into the water environment.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
as POPs from WEEE plastic entering the water environment.		
Any spillage or leakage resulting from the storage of WEEE or processed materials must be collected without delay using equipment and procedures appropriate to the type of spillage. The collected residues must be stored in a lidded, leakproof container. Any containers or surfaces affected by the spillage must be cleaned.	Measures will be taken immediately stop any leakage and prevent it from reaching any surface water drainage system. Absorbent materials and spill kits will be readily available for the treatment of any spillage. Instances of spillage will be recorded and records maintained.	Yes
Forklift drivers must be trained in handling of waste, to minimise forklift truck damage to the integrity of containers or individual appliances.	Adequate training will be provided in regard to the handling of waste to prevent damage to the item and also prevent any spills. Staff will be aware of the importance of safe handling via fork lift trucks.	Yes
Any liquids removed from WEEE must be collected and stored in lidded, leakproof containers. Containers must be kept closed when not being filled and must be stored within a bunded area to contain any leakage or spillage.	Drained compressor oil is to be stored in a bunded tank to minimise the risk of leakage. Degassing machinery and equipment, which extracts oil, is all contained within built-up floor enclosure pens, to ensure containment of any leakage.	Yes
<p>The following must be stored separately and securely from other WEEE in leakproof containers to prevent leakage and spillage:</p> <ul style="list-style-type: none"> ■ Batteries, capacitors and other similar components which could leak; and ■ Any components which may contain residual fluids. <p>Containers must be closed or stored under cover to prevent the accumulation of rainwater.</p>	<p>In general, SMW products containing high quantities of batteries are to remain in the original packaging until batteries are removed.</p> <p>Batteries will be stored in plastic, leakproof containers, along with vermiculite. These small containers will then be stored within a designated battery container.</p> <p>Containers with an impermeable, acid-resistance base and a lid that prevents the ingress of water are to be used for the storage of lead acid batteries.</p>	Yes
Containers must be clearly labelled to identify their contents.	Storage bays will be easily identifiable via the use of labelling based on materials and hazards.	Yes
Where lithium-ion batteries are stored (either separately or as mixed batteries) these must be recognised as a fire hazard and marked and stored accordingly.	A specific battery storage unit will be used on site, to offset the risks that could potentially arise, particularly related to damaged batteries. No batteries will be stored within the building. Due to the fire hazard that is posed, an internal suppression system will be fitted within the container, linked to internal heat and flame detection systems, to enable efficient, early detection of any potential fires.	Yes

As the site will handle a variety of different types of WEEE, additional considerations for each category in relation to their storage arrangements, are discussed in Table 4-5.

Table 4-5 - Guidance on Additional Storage Requirements for Specific Categories of WEEE from Appropriate Measures for WEEE Permitted Facilities

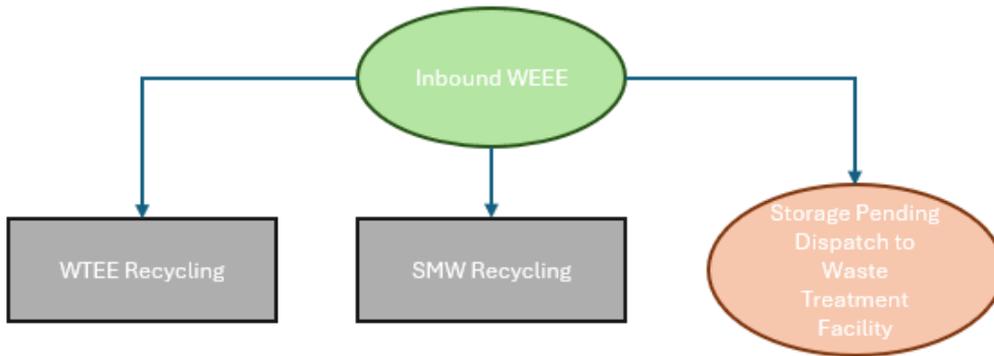
Requirements	Proposed Arrangements	Appropriate Measure?
<p>For flat panel display (FPD) equipment: FPDs which may contain cold-cathode fluorescent lamp (CCFL) backlights must be stored under weatherproof covering.</p>	<p>Enva receive FPD equipment from Household Waste Recycling Centres (HWRF) and retailers. After being manually unloaded and inspected for reuse, failed equipment is to be stored under weatherproof covering in cages, pending dispatch to Cathode Ray Tube (CRT) processor.</p>	<p>Yes</p>
<p>For flat panel display (FPF) equipment: FPDs must be stored in such a way to prevent breakage. They must not be dropped into containers, tipped in bulk or stored loose but should be packed into cages or stillages to minimise movement.</p>	<p>FPF equipment will be handled carefully and by suitably trained Enva staff, from receipt of the item to the beginning of the deconstruction process.</p>	
<p>For flat panel display (FPD) equipment: FPDs can only be stored on pallets if they are stacked and secured to prevent toppling.</p>	<p>Incoming WEEE loads that contain SMW may be stored in designated areas, with suitable covering, or may be immediately transferred into the recycling process. Storage will be so as to prevent unnecessary damage that could lead to environmental pollution.</p>	
<p>For flat panel display (FPD) equipment: Containers of FPDs must only be stored on top of each other where damage to FPDs will be avoided.</p>	<p>Incoming WEEE loads that contain SMW may be stored in designated areas, with suitable covering, or may be immediately transferred into the recycling process. Storage will be so as to prevent unnecessary damage that could lead to environmental pollution.</p>	
<p>For flat panel display (FPD) equipment: Any damaged FPD devices should be prioritised for treatment to minimise any release of mercury vapour.</p>	<p>Incoming WEEE loads that contain SMW may be stored in designated areas, with suitable covering, or may be immediately transferred into the recycling process. Storage will be so as to prevent unnecessary damage that could lead to environmental pollution.</p> <p>If damage to an appliance is recognised, prioritisation for treatment will be considered.</p>	

Requirements	Proposed Arrangements	Appropriate Measure?
<p>For cathode ray tube (CRT) equipment: Display equipment containing CRTs and bare CRTs must be handled carefully and stored in cages, bulk bags or securely on pallets to prevent breakage. They must not be dropped or stacked in an unstable manner.</p>	<p>Enva will receive CRT equipment from Household Waste Recycling Centres (HWRCs). CRT equipment is manually unloaded and stored on a trailer with weatherproof covering, until a full trailer can be dispatched to another waste treatment facility, for suitable treatment.</p>	<p>Yes</p>
<p>For cathode ray tube equipment: Containers of CRT equipment or bare CRTs must not be tipped in bulk unless enclosure, air extraction and abatement are provided to collect all dust generated.</p>	<p>CRT equipment is manually unloaded and stored on a trailer with weatherproof covering, until a full trailer can be dispatched to another waste treatment facility, for suitable treatment.</p>	
<p>For cathode ray tube equipment: Any broken CRTs must be stored under weatherproof covering and prioritised for treatment.</p>	<p>CRT equipment is manually unloaded and stored on a trailer with weatherproof covering, until a full trailer can be dispatched to another waste treatment facility, for suitable treatment.</p>	<p>Yes</p>
<p>For SMW: Untreated and unsorted SMW must not be mechanically compacted or compressed during storage or transport. This is to minimise the dispersion of pollutants and the risk of fires caused by damage to batteries.</p>	<p>SMW will be received from HWRCs predominantly in the form of bulk loads in skips. Alternatively, SMW will be received on site from retailers, and this will be in the form of bags or pallets. It will be stored in a bunker with concrete walls, pending processing. Alternatively, SMW may be transferred into recycling stages immediately after acceptance procedures have been finalised. Prior to any treatment the SMW is subject to sorting activities. There will be no compaction or compression of SMW.</p>	<p>Yes</p>
<p>For Photovoltaic panels: Photovoltaic (PV) panels must be off-loaded, handled and sorted to prevent breakage.</p>	<p>Small volumes of PV panels may be received on site, either incidentally within SMW or as a waste stream of their own. PV panels will be unloaded with care and stored separately and safely, pending dispatch to an external waste treatment facility.</p>	<p>Yes</p>
<p>For Photovoltaic panels: Disconnected photovoltaic panels are still capable of generating electricity which can pose a risk of electrocution or fire. They must be stored glass side down and take other precautions to minimise these risks.</p>	<p>As above.</p>	<p>Yes</p>

4.3.5. PROCESS FLOW

Upon receipt WEEE, the appropriate channel will be determined for specific procedures to be undertaken. This is outlined in Figure 4-1 below.

Figure 4-1 - Process Channels for Incoming WEEE



The main factors to be considered when conducting process determination of procedures to be followed comprise the following:

- Material composition of the component parts of the product to be recycled;
- State of any hazardous waste (solid, liquid or gas) and the neutralisation / disposal procedures required to deal with the specific category of waste;
- Specialised equipment requirement;
- Environmental or health hazards associated with the recycling operation;
- Health and safety of operators;
- Product assessment for reuse potential; and
- Specific treatment activity required.

At the proposed new Dartford WEEE recycling facility, Envva will process specific categories of WEEE, whilst others will be stored and subsequently transferred to external facilities for appropriate treatment. In order to follow the Waste Hierarchy, Envva will aim to recycle as much of the material accepted as possible, as previously mentioned. 90% of the incoming WEEE will be recycled at the Dartford facility, with the remaining 10% being dispatched off site for further treatment or disposal at a designated waste treatment facility.

Based on the specific category of WEEE, different processes will be employed in the recycling process. The categories for recycling are as follows:

- WTEE consisting of fridges and freezers; and
- Small mixed WEEE (SMW), including display screen equipment.

Processing of certain types of WEEE will not be conducted on site and, instead, these waste types will not be accepted at the facility. Pre-acceptance agreements will enable Envva to be fully aware of the incoming WEEE loads, which will ensure that waste types that can be treated at the facility are accepted. Some components collected as a result of the de-manufacturing process may also require further treatment at an external waste treatment facility. Items to be transferred elsewhere include:



- PV panels;
- Non-reusable LDA;
- Batteries;
- Light bulbs; and
- Non-WEEE.

Flatscreens and commercial fridges are items that will be accepted at the Dartford facility (commercial fridges can be cut down to size to suit the equipment that is to be used for recycling at Dartford), however they may also be transferred to other facilities for treatment.

4.3.6. RECYCLING PROCESSES

Waste treatment processes occurring on-site are summarised in this section, with measures differing between treatment of WTEE to the treatment of SMW. Guidance on the treatment procedures is summarised in Table 4-6 below, alongside the proposed arrangements for the Dartford site to fulfil requirements.

Table 4-6 - Guidance on General Waste Treatment from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Where WEEE cannot be prepared for reuse, it must be treated to maximise the recycling and recovery of materials where that is at the same facility or by further downstream processing.</p>	<p>As part of Enva’s ethos, the Waste Hierarchy is followed, in which recycling is given the next priority to refurbishment. WTEE and SMW are treated on site, in recycling processes, with other WEEE being stored and subsequently transferred to external facilities for appropriate treatment elsewhere.</p>	<p>Yes</p>
<p>Waste treatment processes must be fully understood, monitored and optimised to make sure waste is treated effectively and efficiently. Waste must not be treated to deliberately dilute it or mix any hazardous outputs with any non-hazardous outputs.</p>	<p>Inbound waste to the facility will be fully understood, as part of pre-acceptance procedures, prior to acceptance onto site and recycling operations. Therefore, contamination of waste streams is unlikely in this aspect. Waste tracking protocols will also ensure full understanding of the waste treatment and the fate of WEEE being treated, to ensure that the most appropriate outputs are reached.</p> <p>Monitoring of the recycling operations will be under PLC-control, which will cover throughput, O₂ content of the atmosphere in the building, gas capture and blowing agent capture, which highlights the monitoring that will be undertaken across all processes on site.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<p>The treated output materials must meet expectations and must be fully classified and characterised to ensure they are suitable for their intended disposal or recovery route.</p>	<p>An initial pre-sorting procedure will be conducted involving SMW, prior to mechanical treatment, which removes the cause of potential contaminants in the fractions to be ultimately produced. Post-shredding separation will also be incorporated into procedures, which will produce fractions of materials that will then be able to be transferred off-site to relevant waste treatment facilities for appropriate further treatment or disposal. Characterisation of output materials will be judged by experienced and suitably trained Enva operators. Chemical testing is not necessary as these fractions are transferred to other waste treatment facilities who will provide further treatment, based on composition.</p> <p>Enva operate across multiple sites in various locations and have a full understanding of the recycling process and the output fractions. Testing has been carried out in the past on such fractions and provided no variability between sample fractions: all were consistent and similar in characteristics. As the same process will be applied at this facility, chemical testing provides no additional value, as the same fractions will be produced that Enva are highly experienced in dealing with.</p>	<p>Yes</p>
<p>Emissions from the process must be identified and characterised and appropriate measures taken to control them at source.</p>	<p>It is expected that the emission points will have the potential to generate dust and VOCs.</p> <p>Emissions to air and water are controlled, minimising the release of harmful substances to the environment. Regular cleaning and inspection of emissions control systems will be conducted across the site, as well as regular emissions monitoring.</p>	<p>Yes</p>
<p>Written details of treatment activities and the abatement and control equipment in use must be up-to-date. This should include information about the characteristics of the waste to be treated and the waste treatment process, including:</p>	<p>Details with regards to the activities and associated abatement will be included in written procedures to be contained within the site's management system, covering all required aspects. This will include detail on the various waste streams that can be accepted at the facility, how these are to be handled and subsequently recycled. Process flow diagrams will be available to describe the operations</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ Simplified process flowsheets that show the origin of any emissions; ▪ Details of emission control and abatement techniques for emissions to air and water, including details of their performance; ▪ Diagrams of the main plant items where they have environmental relevance (e.g. storage, tanks, treatment and abatement plant design); ▪ Details of manual dismantling processes (e.g. removal of cables and plugs, removal of batteries, capacitors and printer cartridges, draining of oil from radiators); ▪ Details of physical treatment processes (e.g. shredding, separation, compaction, filtration, heating, cooling or washing) ▪ Details of any chemical treatment processes; ▪ Details of any biological treatment processes; ▪ Details of any effluent treatment, including a description of any flocculants or coagulants used; ▪ An equipment inventory, detailing plant type and design parameters (e.g. time, temperature, pressure); ▪ Waste types to be subject to the process; ▪ The control system philosophy and how the control system incorporates environmental monitoring information; ▪ Process flow diagrams (schematics); ▪ Venting and emergency relief provisions; ▪ A summary of operating and maintenance procedures; and ▪ Process instrumentation diagrams. 	<p>that will be undertaken and the various stages that are involved in each. Procedures will be in place that describe the methods required for manual dismantling stages of the recycling process and the subsequent treatment and fragment segregation. This will be supported by a site plan, which will include detail on locations of equipment and storage.</p>	

Requirements	Proposed Arrangements	Appropriate Measure?
<p>There must be up-to-date written details of the measures you will take during abnormal operating conditions to make sure that permit conditions can continue to be complied with. Abnormal operating conditions may include:</p> <ul style="list-style-type: none"> ▪ Unexpected releases; ▪ Start up; ▪ Momentary stoppages; and ▪ Shut down. 	<p>There will be an automated shutdown system in place in the event of any issues or faults arising. The shutdown will be controlled via the automated system, which will also identify the reason and location of the fault. On-site engineers will then be responsible for addressing and rectifying the issue in the system. This system is fully integrated. The process is a batch process, meaning that it can be simply stopped in the event of an issue / fault.</p>	<p>Yes</p>
<p>Material flow analysis should be used for relevant contaminants in the waste to help identify their flow and fate. The analysis should be used to determine the appropriate treatment for the waste either directly at the site or at any subsequent treatment site.</p>	<p>The incoming waste will be fully understood upon receipt, due to the pre-acceptance protocols that will be in place. The process will therefore simply be separation into constituent parts. All waste on site will have been checked and a pre-sorting process, which involves removal of unwanted parts of waste to prevent entry into the shredder system. This means that essentially all contaminants will be removed from the waste streams at the initial stage for both WTEE and SMW.</p>	<p>Yes</p>
<p>Materials flow analysis considers the contaminant quantity in the:</p> <ul style="list-style-type: none"> ▪ Waste input; ▪ Different waste treatment outputs; and ▪ Waste treatment emissions. 	<p>There are to be no contaminants present within the WEEE. The process will therefore simply be separation into constituent parts.</p>	<p>Yes</p>
<p>Analysis and knowledge of the fate of the contaminants should be used to make sure that they are correctly treated and either destroyed or removed.</p>	<p>There are to be no contaminants present within the WEEE. The process will therefore simply be separation into constituent parts.</p>	<p>Yes</p>
<p>The use of material flow analysis is risk-based considering:</p> <ul style="list-style-type: none"> ▪ The hazardous properties of the waste; ▪ The restricted chemicals in the waste; 	<p>The incoming waste will be fully understood upon receipt, due to the pre-acceptance protocols that will be in place. The process will therefore simply be separation into constituent parts. All waste on site will have been checked and a pre-sorting process, which involves removal of unwanted parts of waste to prevent entry into the</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ The risks posed by the waste in terms of process safety; ▪ Occupational safety and environmental impact; and ▪ Knowledge of the previous waste holders. 	<p>shredder system. This means that essentially all contaminants will be removed from the waste streams at the initial stage for both WTEE and SMW.</p>	
<p>A treatment process may destroy certain substances in the waste. It could also put substances into the air, water or ground, or produce residues which are sent for disposal. The weight of these outputs should be minimised. The treatment process may produce residues for recovery or reuse - the weight of these outputs should be maximised.</p>	<p>The treatment processes will not destroy any substances within the accepted wastes.</p> <p>The treatment processes will maximise the recovery or reuse of residues as it is designed to deconstruct the WEEE into appropriate fractions for recovery at an external waste treatment facility.</p>	Yes
<p>Treatment should not proceed if the risk assessment or material flow analysis indicates that losses from a process will cause:</p> <ul style="list-style-type: none"> ▪ The breach of an environmental quality standard; ▪ The breach of a benchmark; and ▪ A significant environmental impact. 	<p>Recycling activities can be shutdown, due to the batch nature of the process. Automated process monitoring will be carried out as part of the integrated nature of the recycling equipment.</p>	
<p>To track and control the process of change, there must be a written procedure for proposing, considering and approving changes to technical developments, or to procedural quality changes.</p>	<p>A written procedure will be developed for management of change.</p>	Yes
<p>The release of diffuse emissions to air from activities which may give rise to them (e.g. shredding or granulation) must be minimised by:</p> <ul style="list-style-type: none"> ▪ Carrying out the activity using enclosed equipment or in an enclosed building; ▪ Maintaining the enclosed equipment or buildings under an appropriate pressure; and ▪ Collecting and directing the emissions to an appropriate abatement system. 	<p>All recycling operations, which could result in fugitive emissions, are to take place inside the warehouse. Section 5.2 outlines the abatement that will be in place for emissions. Section 1.1 provides further details on the abatement measures in place for fugitive emissions, in particular, dust.</p>	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Unless being prepared for reuse, all fluids must be removed from WEEE along with those substances, mixtures and components listed in Annex VII of the WEEE Directive⁹.</p>	<p>Details on the preparation and recycling processes that WEEE will undergo on site is outlined in Sections 4.3.6.1 and 4.3.6.2. For the recycling of WTEE, the oil / coolant mixture from the compressor will be extracted under vacuum. In the treatment of SMW, any WEEE or component containing fluid (e.g. oil-filled radiators) are to be removed prior to mechanical treatment.</p>	<p>Yes</p>
<p>Removal may be a staged process and may be undertaken at different facilities. It must be demonstrated that either:</p> <ul style="list-style-type: none"> ▪ The substances, mixtures and components listed in Annex VII of the WEEE Directive⁹ have been removed from WEEE as required by the conditions of the permit; or ▪ Those substances, mixtures and components will be removed at a suitable authorised downstream treatment facility. 	<p>Prior to any mechanical treatment of WTEE or SMW, all components listed in Annex VII of the WEEE Directive will be removed as required, including electric cables, light bulbs and capacitors.</p>	<p>Yes</p>
<p>Ensure that any substances, mixtures and components removed as part of the treatment process are subsequently recovered or disposed of at an appropriately permitted facility.</p>	<p>Any residual materials collected throughout treatment processes are to be stored in a safe manner in designated storage areas, pending dispatch to alternative waste treatment facilities.</p>	<p>Yes</p>
<p>If partially treated WEEE is transferred to another site, it must be properly described, to the recipient knows which treatments are complete and which still need to be done.</p>	<p>Certain WEEE streams cannot be recycled at this site and so these shall be bulked, packaged and dispatched to other waste treatment facilities, as well as other outbound materials from the de-manufacturing process that require further treatment or processing by external waste treatment facilities. All outbound materials are documented s to any activities undertaken at site in addition to the appropriate transfer or consignment note.</p>	<p>Yes</p>
<p>Certain hazardous items and substances that were once used in electrical appliances but are now banned should no longer be routinely found. However, they may still be present on occasions. For example, any capacitors found in equipment manufactured before 1987 should be assumed to contain</p>	<p>Capacitors identified in Annex VII of the WEEE Directive are to be removed from SMW streams, prior to any mechanical treatment.</p>	<p>Yes</p>



Requirements	Proposed Arrangements	Appropriate Measure?
<p>polychlorinated biphenyls (PCBs) unless there is clear evidence to the contrary. Asbestos may be found in old coffee pots and heating elements. These possibilities must be something to be alert to and ensure that documented procedures are in place to identify and remove them for appropriate disposal before any mechanical or shredding operation takes place.</p> <p>Capacitors containing PCB are POPs waste and must be treated in a way that results in the destruction of the PCB content.</p>		
<p>The outputs of the treatment activity must be monitored and recorded, including their weight. The monitoring must be used to provide evidence that the treatment and removal of these components and substances has been carried out to a satisfactory standard.</p>	<p>All materials leaving the site are weighed. Such data is entered into the Tegos system.</p>	<p>Yes</p>
<p>When removing components, the whole item must be safely removed, where breaking it up might:</p> <ul style="list-style-type: none"> ▪ Pollute the recycle or waste stream; or ▪ Result in unacceptable emissions. 	<p>Much of the initial dismantling process and removal of certain components is carried out manually, which helps to ensure safe removal.</p>	<p>Yes</p>
<p>Components that must always be removed as a whole, that is intact and identifiable (unless this guidance states specific circumstances where they do not need to) include:</p> <ul style="list-style-type: none"> ▪ Capacitors containing PCBs; ▪ Mercury containing components; ▪ Toner cartridges; ▪ Components with asbestos; ▪ Components with refractory ceramic fibres; ▪ Components with radioactive substances; ▪ Gas discharge lamps including CCFL backlights; ▪ Cathode ray tubes; 	<p>As detailed above and also in Sections 4.3.6.1 and 4.3.6.2, relevant components will be removed prior to recycling treatment, whole, intact and identifiable.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ Electrolyte capacitors containing substances of concern that have a height or diameter greater than 25 mm, or have a proportionately similar volume; and ▪ Batteries and powerpacks. 		
<p>Instead of removing them as whole components, the following may be removed as fragments or materials using mechanical treatment:</p> <ul style="list-style-type: none"> ▪ Chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) or hydrofluorocarbons (HFCs), hydrocarbons (HCs); ▪ External electric cables; ▪ Printed circuit boards; ▪ Liquid crystal displays; ▪ The activated coating in cathode ray tubes (CRTs); and ▪ Plastic with brominated flame retardants (BFRs) 	<p>As described in Sections 4.3.6.1 and 4.3.6.2, mechanical treatment forms part of the treatment process for both WTEE and SMW, producing fractions, which can be separated further. For example, following mechanical treatment of SMW, cables, printed circuit boards, residual internal batteries and plastics containing BRFs will be removed.</p>	<p>Yes</p>
<p>It is possible to either:</p> <ul style="list-style-type: none"> ▪ Sort batteries on site; or ▪ Send batteries as a mixture of chemistry types to a specialist battery treatment operator for sorting. 	<p>Batteries are collected as part of the treatment process for SMW, with batteries designed to be accessible to the user removed prior to mechanical treatment and any residual internal batteries to be removed post-mechanical treatment. Batteries will be collected and stored in a preferred storage location of a shipping container in an isolated area of yard, pending collection for further treatment / disposal at a waste treatment facility.</p>	<p>Yes</p>
<p>Lithium and lithium-ion batteries removed from WEEE during treatment must be packed and stored in a way to minimise the likelihood of electrical shorting, physical impact and overheating.</p>	<p>Any batteries removed from WEEE prior to mechanical treatment will be stored in the designated storage area, outside of the building. As stated in Table 4-4, this battery container will be fitted with an internal suppression system, linked to an internal heat detection system, so as to prevent risks associated with the storage of such residual items.</p>	<p>Yes</p>



Requirements	Proposed Arrangements	Appropriate Measure?
All outdoor WEEE treatment areas must have an impermeable surface with a sealed drainage system. It must collect all surface water run-off and channel it to a blind sump unless it may be lawfully discharged.	All relevant areas will have an impermeable surface with a sealed drainage system, in which all surface water will drain into.	Yes
Indoor WEEE treatment areas must be an impermeable surface and spillage collection facilities must be provided appropriate to the materials being handled.	All relevant areas will have an impermeable surface, and absorbent materials will be available to treat any spillage.	Yes
WEEE treatment should take place under weatherproof covering such as a roofed building. Where this is not practicable, for example, due to the large size of the plant, appropriate measures must be taken to minimise the exposure of waste to rain and wind. This may include the covering of: <ul style="list-style-type: none">▪ Hoppers;▪ Conveyors;▪ Skips of treated materials; and▪ Storage bays containing treated materials.	The majority of recycling operations are to take place inside the warehouse, with only the pre-treatment activities (removal of certain components) to be undertaken in the yard.	Yes

Mechanical treatment is used across the different treatment channels. The arrangements proposed are compared against the BAT requirements from the Waste Treatment BREF below (in Table 4-7).

Table 4-7 - BAT Requirements for Mechanical Treatment of Waste and Mechanical Treatment in shredders of Metal Waste from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangement	BAT?
<p>BAT 25: In order to reduce emissions to air of dust, and of particulate-bound metals, PCDD/F and dioxin-like PCBs, BAT is to apply BAT 14d and to use one or a combination of the techniques given below.</p> <ol style="list-style-type: none"> Cyclone Fabric filter Wet scrubbing Water injection into the shredder <p>BAT-associated emission levels are outlined in the BREF document.</p>	<p>Techniques to be used to reduce the emissions to air of dust are outlined in Section 5.2.</p>	<p>Yes</p>
<p>BAT 26: In order to improve the overall environmental performance, and to prevent emissions due to accidents and incidents, BAT is to use BAT 14g and all of the techniques given below:</p> <ul style="list-style-type: none"> ■ Implementation of a detailed inspection procedure for baled waste before shredding; ■ Removal of dangerous items from the waste input stream and their safe disposal (e.g. gas cylinders, non-depolluted EoLVs, non-depolluted WEEE, items contaminated with PCBs or mercury, radioactive items); and ■ Treatment of containers only when accompanied by a declaration of cleanliness 	<p>WEEE waste will not be baled prior to mechanical treatment.</p> <p>As previously outlined, a pre-sorting procedure will be undertaken to remove any relevant items from the WEEE that could contaminate waste streams or pose risks. This will involve the emptying WTEE of all foreign matter, all waste components and loose parts and any parts stipulated in Annex II Section 1 of Directive 2002/96/EC¹³ (mainly electric cables and lightbulbs).</p> <p>For SMW, items identified by Annex II Section 1 of Directive 2002/96/EC¹³ will be manually removed and segregated for further treatment.</p>	<p>Yes</p>
<p>BAT 27: In order to prevent deflagrations and to reduce emissions when deflagrations occur, BAT is to use technique a. and one or both of the techniques b. and c. given below.</p> <ol style="list-style-type: none"> Deflagration management plan Pressure relief dampers Pre-shredding 	<p>There are no intended deflagrations. This is because the WTEE plant will be operating under an inert atmosphere, using nitrogen, preventing such instances. Further to this, SMW will be sorted manually, prior to treatment, which will help to avoid mechanical treatment of those materials that are likely to cause deflagrations.</p>	<p>Yes</p>

¹³ [Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment \(WEEE\) \(repealed\).](#)

BREF Requirements	Proposed Arrangement	BAT?
<p>BAT 28: In order to use energy efficiently, BAT is to keep the shredder feed stable.</p> <p>The shredder feed is equalised by avoiding disruption or overload of the waste feed which would lead to unwanted shutdowns and start-ups of the shredder.</p>	Shredder feed energy efficiency-related provisions are outlined in Table 3-10.	Yes

Volatile fluorocarbons (VFCs) should be considered as these substances have been historically used in foam blowing agents and refrigerants in the cooling circuits, which are to be extracted as part of the WTEE recycling activities at Dartford. These chemicals have Global Warming Potential (GWP) and Ozone Depleting Potential (ODP) and so provisions should be implemented for safe handling. Volatile hydrocarbons (VHCs) are a modern alternative to VFCs and have less of an environmental impact, however, should still be handled carefully, due to their flammability causing a risk of explosion. Therefore, recycling equipment to be used at Dartford for WTEE treatment will be specially designed to capture blowing agents, to be dispatched to alternative waste treatment facilities for destruction. Provisions will be in place at the facility, such as an inert atmosphere within the WTEE recycling plant, to mitigate explosion risks – this are further explained below, in Table 4-8.

Table 4-8 - BAT Requirements for Treatment of WEEE Containing VFCs and / or VHCs from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangement	BAT?
<p>BAT 29: In order to prevent or, where that is not practicable, to reduce emissions of organic compounds to air, BAT is to apply BAT 14d, BAT 14h and to use technique a. and one or both of the techniques b. and c. given below.</p> <ul style="list-style-type: none"> ■ Optimised removal and capture of refrigerants and oils ■ Cryogenic condensation ■ Adsorption <p>BAT-associated emission levels are outlined in the BREF document.</p>	<p>Prior to any mechanical treatment, the oil / coolant mixture is removed from WTEE by attaching a suction / drilling head to the compressor, establishing a seal, drilling a hole into the compressor and then allowing the oil / coolant mixture to be extracted under vacuum. Once removed, the oil / coolant mixture can be separated into oil and coolant, for subsequent processing. This is stage 1 of the recycling process.</p>	Yes
<p>BAT 30: In order to prevent emissions due to explosions when treating WEEE containing VFCs and/or VHCs, BAT is to use either of the techniques given below.</p> <p>Inert atmosphere Forced ventilation</p>	<p>Throughout the shredding stage of WTEE recycling treatment, an inert nitrogen atmosphere is utilised, as well as during PUR foam processing stage. In these instances, nitrogen provides an inert atmosphere to mitigate against fire and explosion risks. The recycling process of WTEE is described in further detail in Section 4.3.6.1.</p>	Yes

Mercury is a hazardous component of SMW that requires careful handling to prevent environmental impacts, as well as impacts to human health. Mercury is likely to be present in switches in SMW that will be accepted at the Dartford facility. Therefore, protocols will be in place, particularly as part of the pre-treatment manual dismantling procedures, to prevent contamination of the final fragments. Measures are detailed in Table 4-9 below.

Table 4-9 - BAT Requirements for Mechanical Treatment of WEEE Containing Mercury from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangement	BAT?
<p>BAT 25: In order to reduce emissions to air of dust, and of particulate-bound metals, PCDD/F and dioxin-like PCBs, BAT is to apply BAT 14d and to use one or a combination of the techniques given below.</p> <ul style="list-style-type: none"> ■ Cyclone; ■ Fabric filter; ■ Wet scrubbing; and ■ Water injection into the shredder. <p>BAT-associated emission levels are outlined in the BREF document.</p>	<p>Techniques to be used to reduce the emissions to air of dust are outlined in Section 5.2.</p>	<p>Yes</p>
<p>BAT 32: In order to reduce mercury emissions to air, BAT is to collect mercury emissions at source, to send them to abatement and to carry out adequate monitoring.</p> <p>This includes all of the following measures:</p> <ul style="list-style-type: none"> ■ equipment used to treat WEEE containing mercury is enclosed, under negative pressure and connected to a local exhaust ventilation (LEV) system; ■ waste gas from the processes is treated by dedusting techniques such as cyclones, fabric filters, and HEPA filters, followed by adsorption on activated carbon (see Section 6.1); ■ the efficiency of the waste gas treatment is monitored; ■ mercury levels in the treatment and storage areas are measured frequently (e.g. once every week) to detect potential mercury leaks. <p>BAT-associated emission levels are outlined in the BREF document.</p>	<p>Detailed in Section 4.3.6.2, the treatment of SMW involves removing any components containing mercury, such as fluorescent lamps or mercury switches. These items are collected and stored safely in designated areas, pending dispatch to waste treatment facilities for appropriate processing.</p>	<p>Yes</p>

PCBs are not likely to be prevalent in WEEE loads. However, they are present in capacitors, which are often part of WEEE. Capacitors will be removed manually from waste and will be prevented from entering the mechanical treatment stages of recycling and subsequently prevented from contaminating fractions. Such measures are described in Table 4-10.

Table 4-10 - BAT Requirements for Physico-chemical Decontamination of Equipment Containing PCBs from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangement	BAT?
<p>BAT 51: In order to improve the overall environmental performance and to reduce channelled emissions of PCBs and organic compounds to air, BAT is to use all of the techniques given below.</p> <ul style="list-style-type: none"> a. Coating of the storage and treatment areas b. Implementation of staff access rules to prevent dispersion of contamination c. Optimised equipment cleaning and drainage d. Control and monitoring of emissions to air e. Disposal of waste treatment residues f. Recovery of solvent when solvent washing is used 	<p>Process equipment will be contained in sealed units, meaning staff will not have access that will give rise to dispersion of contamination.</p> <p>Coating of equipment used in recycling processes will be accounted for by manufacturers.</p> <p>Cleaning and drainage associated with the equipment will be optimised as part of the facility design and site plans. Emissions to air will also be considered and point sources will be fitted with appropriate controls and monitoring, as outlined in Sections 5.1 and 5.2. Any residues arising from treatment of WEEE will be appropriately separated and stored in designated storage area, pending transfer to external waste treatment facilities for further treatment or disposal.</p> <p>Solvent washing will not be applicable at the facility.</p>	<p>Yes</p>

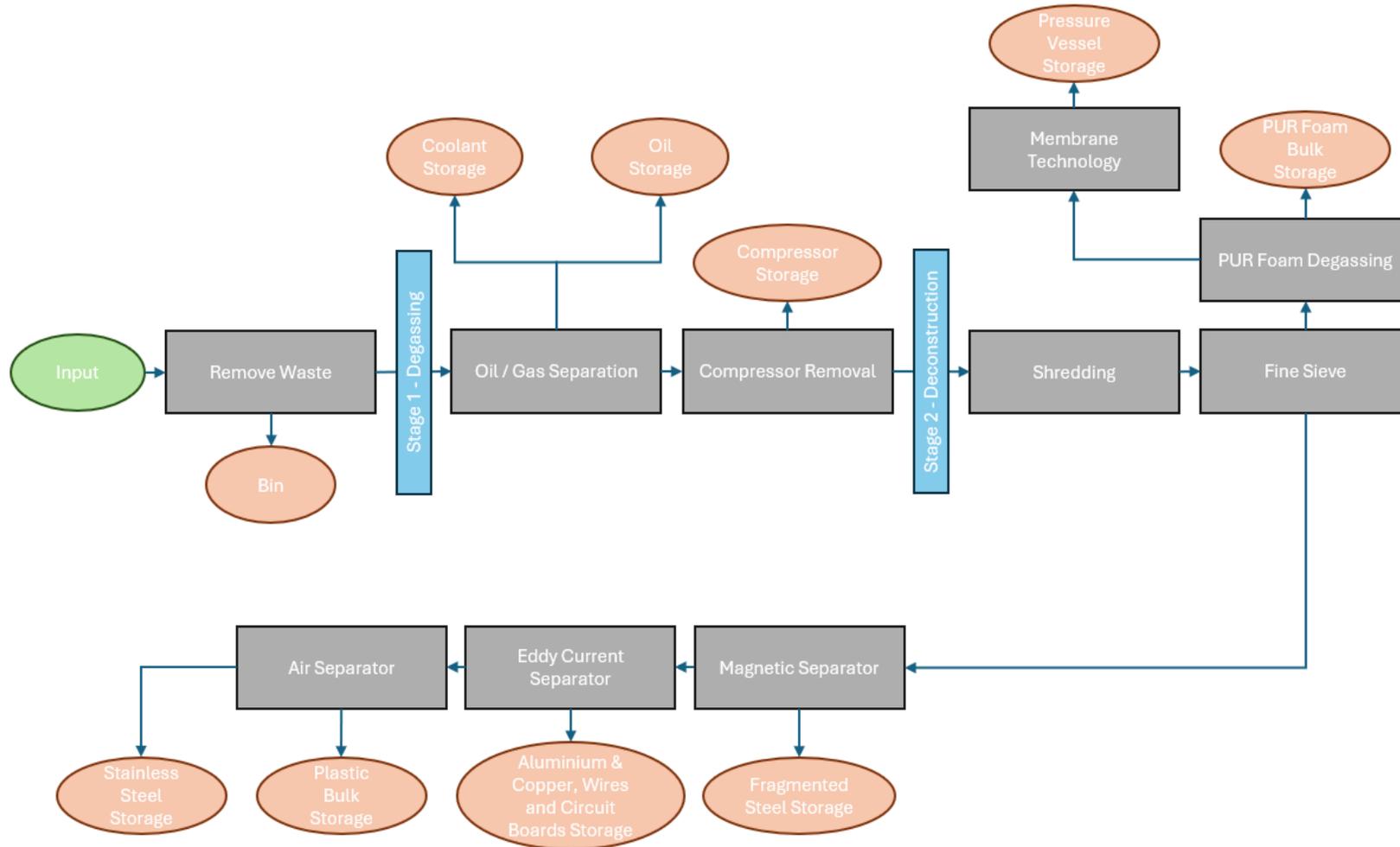
4.3.6.1. Recycling of Refrigerators / Freezers

The de-manufacturing equipment to be implemented on site to be used to process WTEE (fridges and freezers) will be purpose built, in line with equipment successfully utilised at Enva's Grantham facility. Recycling of domestic WTEE containing chloroflourocarbon (CFC) and hydrofluorocarbon (HFC) coolant and blowing agents will be carried out in this plant. Small, medium, large and American fridges and fridge freezers will be accepted by this plant. Commercial fridges may be processed on site –they will first need to be cut down so that they are of a suitable size for the WTEE recycling plant equipment. The process for ammonia fridges will involve manual dismantling, to remove the ammonia unit from the housing, under EA guidance²⁰. Ammonia will be stored in a sealed container, away from heat sources, until collection by a third-party specialist facility, for treatment.

The recycling process undertaken for all cooling items is outlined in Figure 4-2 below. In summary, once all relevant parts have been stripped and removed from the WTEE item (including food or drink, electric cable, light bulbs, glass shelving and any other parts which are not conducive to shredding and automated fraction sorting), the WTEE undergoes degassing, with coolant being extracted under vacuum. Oil and coolant are to be dispatched off-site for destruction. The compressor will then be removed using appropriate tools and will be used for further on-site processing (dismantled via dedicated equipment on-site, once drained of oil) or sale as a stream. Plastic components of concern that potentially contain POPs will also be removed and treated in a separate process. Following this, a single stage shredding machine (QZ2500) is employed to form small pieces of fragmented scrap material from the stream of WTEE carcasses. Insulation foam is removed during the fragmentation process too, ensuring an effective separation of the waste stream components in the next stage. Ferrous, non-ferrous, plastic and polyurethane (PUR) foam scrap are to be separated using a variety of techniques for each: a fine sieve for PUR foam removal (which is then heated to remove blowing agent gases for capture via a membrane technology process, to then be dispatched off site for appropriate disposal), magnetic separation for ferrous scrap removal, and an eddy current separator will be used for separating the non-ferrous metals, cables and circuit boards from chipped plastic. Plastics will be bagged for sale to a plastics refiner. Fire risk will be mitigated via the use of an inert nitrogen atmosphere (employed throughout shredding and PUR foam processing stages), which will also act as a carrier gas for transport of recovered coolant gas. Other equipment containing blown foam will also be able to be processed by this WTEE recycling plant but will need to first be cut to size to be accommodated by the in-feed aperture.



Figure 4-2 - WTEE Process Flow Diagram



4.3.6.2. Small WEEE Processing

An overview of the process required for SMW recycling is provided in the process flow diagram in Figure 4-3, with a summary given in this section. From the small WEEE waste stream, certain items will be removed either prior to shredding or post shredding in a manual hand-picking station (located external to the main building, but within a purpose-built cabin, offering suitable weatherproof covering), segregated for further treatment or landfill. Items to be removed before mechanical treatment include:

- Any WEEE or component containing a fluid, e.g. oil filled radiators;
- Any mercury-containing components, e.g. fluorescent lamps / mercury switches;
- Any WEEE containing CRT or FPD > 100 cm²;
- Any WEEE containing asbestos or refractory fibres;
- Any WEEE containing radioactive substances, e.g. ionisation smoke detectors;
- Any WEEE containing CFCs, HCFCs, HFCs or hydrocarbon gases, e.g. small refrigeration equipment, air conditioners and dehumidifiers;
- All external batteries and internal batteries designed to be accessible by the user;
- Any non-WEEE that may contain fluids or hazardous substances, e.g. gas bottles, lawn mowers;
- Capacitors identified in Annex VII of the WEEE Directive9;
- Ink and toner cartridges; and
- External electric cables.

Cabled, printed circuit boards, and residual internal batteries, and plastics containing BFRs are to be removed post mechanical treatment.

Once the relevant items have been removed from the SMW, mechanical conveyors leading to a QZ2500 shredder will separate and size reduce the feed into relatively small fractions (20 – 50 mm range). The shredder will be contained within Unit 6, which will provide an acoustic enclosure to control sound levels in the vicinity (this is supported by a 4 m high acoustic fence surrounding the site). Resulting fractions will be automatically segregated into ferrous and several categories of non-ferrous and steel is removed by a magnetic separator for subsequent collection and recycling. Electrical motors are also discharged here and there will be a picking station on the ferrous output for collection of copper armatures.

A vibrating table will be employed to size-separate the non-ferrous streams, with fines being removed for POPs recovery. For the small fraction, an eddy current separator will be utilised to recover aluminium and non-ferrous material (leaving residual material for POPs recovery again). Picking stations will be implemented for the large fraction, removing general waste, cables and wires, stainless steel and circuit boards, with the eddy current separated being used to again to separate the various grades of non-ferrous metal. Non-ferrous metal scrap will be bagged (approximately 1 tonne capacity bags) for transfer to an alternative waste treatment facility for processing. Material will follow a circular route, with all large plastic fractions being picked at the picking station. To minimise the amount non-segregated fractions (which are often needed to be landfilled), any input waste commodities with high content of material other than metallic or plastic will be 'batched' to minimise plastic contamination.

Figure 4-3 - SMW Processing Flow Diagram

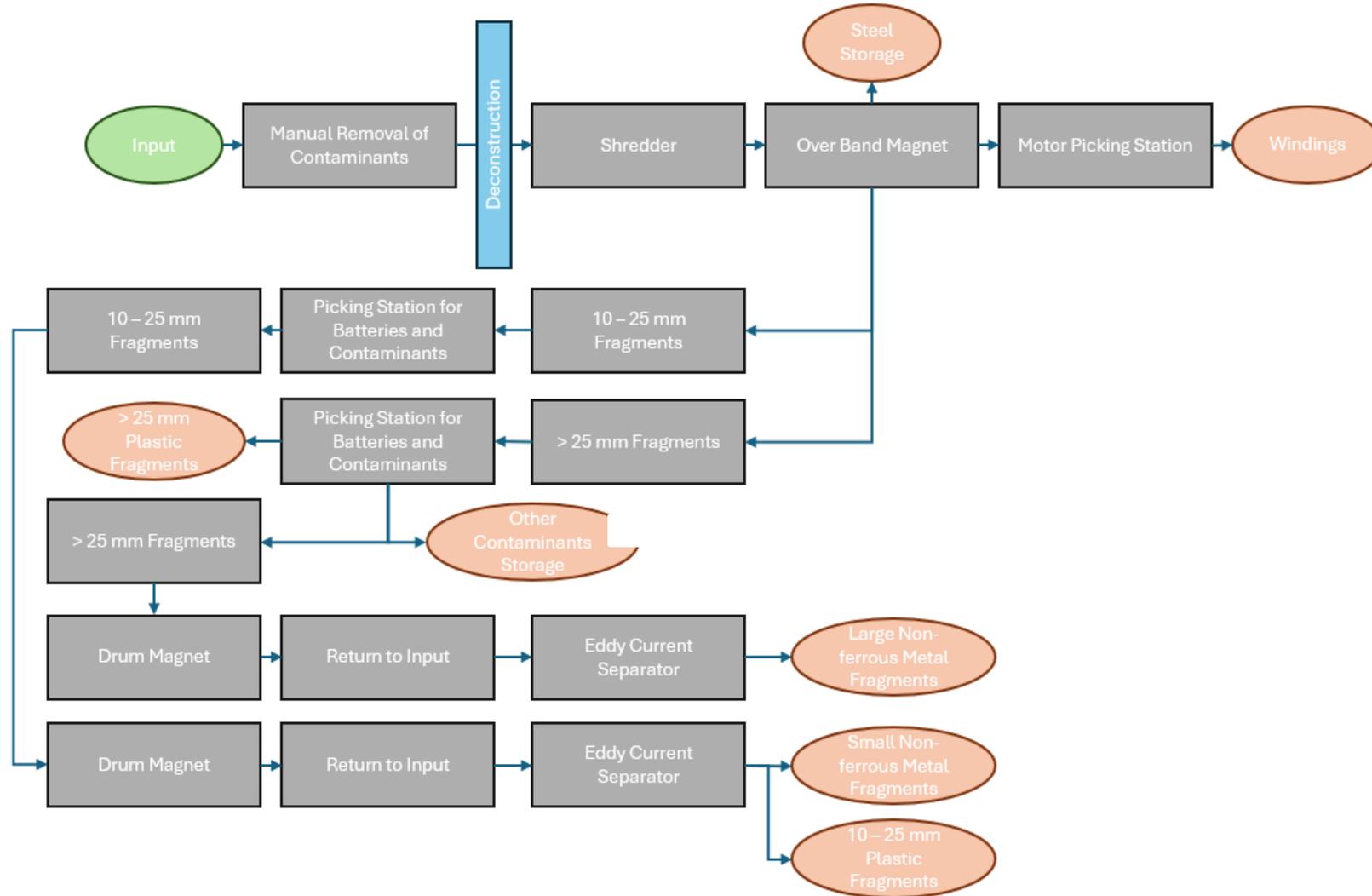


Table 4-11 - Guidance on Treatment of SMW from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Small mixed waste electrical and electronic equipment (SMW) can consist of many different categories of WEEE, including those requiring specific forms of treatment such as CRT equipment, gas discharge lamps and temperature exchange equipment containing refrigerants. Items such as these should be identified and removed for appropriate treatment.</p>	<p>From the SMW waste stream, certain items will be removed as detailed above either prior to shredding or post-shredding in a manual hand-picking station, segregated for further treatment or landfill.</p>	<p>Yes</p>
<p>If any particular categories of SMW are treated separately, this guidance still applies, subject to any category specific guidance that may exist.</p>	<p>No SMW to be treated separately. Either subject to the process as detailed above or sent to a third-party waste treatment facility for recycling.</p>	<p>N/A</p>
<p>Some appliances found in SMW are known to contain high concentrations of POPs in plastic components such as casings, cables and printed circuit boards. SMW and plastic containing fractions from SMW must be managed as POPs waste, unless it can be proven that they are not.</p>	<p>Fraction separation is employed following shredding. Fines are subsequently removed from non-ferrous streams and are sent to processors for POPs recovery. Any residual material, mainly plastic, is also sent for POPs recovery.</p>	<p>Yes</p>
<p>The following items must be removed from SMW before mechanical treatment:</p> <ul style="list-style-type: none"> ■ Any WEEE component containing a fluid, such as oil filled radiators; ■ Any components containing mercury such as fluorescent lamps and mercury switches; ■ Any WEEE containing any CRT display or FPD of greater than 100 cm² in area; ■ Any WEEE containing asbestos or refractory ceramic fibres identified in Annex VII of the WEEE Directive⁹; ■ Any WEEE or component containing radioactive substances, such as ionisation smoke detectors; ■ Any WEEE containing CFCs HCFCs, HFCs or hydrocarbon gases, such as small refrigeration equipment, portable air conditioners and dehumidifiers; 	<p>From the small WEEE waste stream, the following items are to be removed:</p> <ul style="list-style-type: none"> ■ Any WEEE or component containing a fluid, e.g. oil filled radiators; ■ Any mercury-containing components, e.g. fluorescent lamps / mercury switches; ■ Any WEEE containing CRT or FPD > 100 cm²; ■ Any WEEE containing asbestos or refractory fibres; ■ Any WEEE containing radioactive substances, e.g. ionisation smoke detectors; ■ Any WEEE containing CFCs, HCFCs, HFCs or hydrocarbon gases, e.g. small refrigeration equipment, air conditioners and dehumidifiers; ■ All external batteries and internal batteries designed to be accessible by the user; 	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ■ All external batteries (including powerpacks) and internal batteries designed to be accessible by the user; and ■ Any non-WEEE items that may contain fluids or hazardous substances, such as petrol lawnmowers or gas cylinders. 	<ul style="list-style-type: none"> ■ Any non-WEEE that may contain fluids or hazardous substances, e.g. gas bottles, lawn mowers; ■ Capacitors identified in Annex VII of the WEEE Directive⁵; ■ Ink and toner cartridges; and ■ External electrical cables. 	
<p>The following items must be removed from SMW before mechanical treatment unless the specific process makes sure they remain whole and intact, and there are effective procedures in place to remove them following that treatment:</p> <ul style="list-style-type: none"> ■ Capacitors identified in Annex VII of the WEEE Directive⁹; and ■ Ink and toner cartridges. 	<p>As detailed above, the following items will be removed from SMW before mechanical treatment:</p> <ul style="list-style-type: none"> ■ Capacitors identified in Annex VII of the WEEE Directive⁵; and ■ Ink and toner cartridges. 	Yes
<p>The following must also be removed from SMW, but this can be done as material streams after mechanical treatment:</p> <ul style="list-style-type: none"> ■ External electrical cables; ■ Printed circuit boards from mobile phones and from other devices if greater than 10 cm² in area; ■ Batteries other than those identified in measures above, provided they remain intact and identifiable; and ■ Plastics containing BFRs. 	<p>Following mechanical treatment, the items to be removed include:</p> <ul style="list-style-type: none"> ■ Cables; ■ Printed circuit boards; ■ Residual internal batteries; and ■ Plastics containing BFRs. 	Yes
<p>If SMW is mechanically treated, an effective dust extraction and abatement must be provided and used to minimise dust release.</p>	<p>In Sections 5.2 and 5.4.2, abatement techniques are discussed. To combat dust release, recycling processes are enclosed within Unit 6 at the facility, with only 1 point source emission from the SMW recycling process, which will be fitted with a central de-dusting unit.</p>	Yes
<p>Where a mechanical process is used to shred SMW, the physically finest non-metallic fraction must be sampled at least once every 6 months and tested for:</p> <ul style="list-style-type: none"> ■ Mercury within a limit value of 1 mg/kg; and ■ Cadmium with a limit value of 100 mg/kg. 	<p>Any components of the waste stream containing mercury (e.g. fluorescent lamps / mercury switches) will be removed prior to mechanical treatment, as described above.</p>	Yes

4.3.6.3. Treatment of Photovoltaic Panels

The table below demonstrates the appropriate process that should be undertaken during the treatment of PV panels. PV panels will be accepted in incoming loads at the facility; however, the recycling equipment that will be installed on site does not have the capability for treatment of such items, Therefore, there will be a designated storage area at the facility for PV panels, pending dispatch to an alternative waste treatment facility.

Table 4-12 - Guidance on the Treatment of Photovoltaic Panels from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>PV panels may contain hazardous substances such as lead (in solder), cadmium telluride and compounds of selenium (in the semiconductor layer of non-silicon based PV panels). An effective process should be established, maintained and used for identifying non-silicon based photovoltaic panels.</p>	<p>Current proposed arrangements for PV panels on site only involve storage and subsequent transfer off-site to a permitted PV recycling plant for treatment. The proposed facilities and equipment on site do not allow for PV panel recycling.</p>	<p>N/A</p>
<p>The leaf must be removed from all PV panels and the hazardous semiconductor layer must also be removed from non-silicon based PV panels.</p>	<p>As above.</p>	<p>N/A</p>
<p>Where shredding of non-silicon based PV panels takes place, the recycled glass fraction must be sampled and tested at least once every 6 months for cadmium with a limit value of 10mg/kg cadmium.</p>	<p>As above.</p>	<p>N/A</p>

4.3.7. PROCESS MONITORING

At the Dartford facility, process monitoring is embedded into all procedures that are to be performed on site. Below, in Table 4-13, the proposed arrangements are described alongside the relevant appropriate measures.

Table 4-13 - Guidance on Process Monitoring from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>At least once a year, for every WEEE stream being treated, a mass balance exercise must be carried out to determine and record the mass of each individual output. fraction derived from a given mass of input material. The batch size must be large enough to ensure a representative sample of typical input materials can be assessed.</p>	<p>Using the data capture system, Tegos, information required to produce a mass balance is collated and presented on a regular basis. Output materials are weighed, as well as all inbound loads, in order to provide such information.</p>	<p>Yes</p>
<p>Compare each set of results with previous results to monitor the performance of your site and to ensure it is performing optimally.</p>	<p>The Tegos system will be essential in ensuring data is captured and stored, to enable comparisons to be made annually and monitor performance.</p>	<p>Yes</p>
<p>Where process monitoring requires chemical analysis to be carried out on waste fractions and residues produced by treatment processes, this must be carried out by an independent accredited laboratory, using recognised accredited methods where they are available.</p>	<p>As mentioned above, Enva are highly experienced in such recycling activities, as they operate multiple sites across the UK, undertaking the same process. Testing of fractions has been focussed on at other locations, providing results that show consistency between samples, highlighting that standard fractions will be produced. There is no benefit in fraction testing at the Dartford facility as the same processes are to be replicated.</p>	<p>Yes</p>
<p>Full description of the material testing and analysis procedures and methods used must be able to be provided, which provide details of the calibration methods and reference standards used.</p>	<p>As above.</p>	<p>Yes</p>
<p>Choose the sample containers and packaging used for storing and transporting according to the nature and requirements of the materials they will contain. For example, chemical properties, pressure and gas tightness.</p>	<p>Storage of the various materials on site will always be supported by the necessary bunding and containment. Hardstanding concrete surfaces will be across the site, to prevent ground contamination.</p>	<p>Yes</p>
<p>Sample containers must be clearly labelled with at least the name of the treatment facility, a description of the waste material or residue contained, the waste stream it was produced from and the date of sampling.</p>	<p>All of these measures are adopted for samples to be tested.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
Ensure that any required sample is representative of the waste and has been taken by someone technically competent to do so. A representative sample is one that takes account of the full variation and any partitioning of the material.	A representative sample will be taken by a suitably qualified and trained member of staff.	Yes
Samples must be stored in a dark, cool place and dispatched to the laboratory for analysis as soon as possible, preferably within 24 hours of being taken.	Samples will be stored in a cool, dark place and submitted to the test laboratory within 24 hours of completion of sample collection.	Yes
Sampling must be carried out under normal operating conditions unless otherwise stated.	The processes are batch processes, and any abnormal circumstances would result in a process shutdown.	N/A
<p>If process monitoring shows that the performance of the treatment plant does not meet any of the standards stated in this guidance, a report must be sent to the Environment Agency, summarising:</p> <ul style="list-style-type: none"> ■ The actions that will be taken to improve performance in order to achieve the standards give, including any additional sampling and testing; and ■ The dates the actions will be completed by, including the dates for any additional sampling and testing. 	The process is a PLC-monitored process and if not operating in accordance with the designed measures will be subject to corrective measures to reach the desired performance levels.	Yes
<p>Wherever possible, waste fractions and residues must be sampled in line with relevant guidance, for example:</p> <ul style="list-style-type: none"> ■ WM3 Waste classification – Guidance on the classification and assessment of waste – Appendix D¹⁴; ■ EN 14899 Characterization of waste – Sampling of waste materials – Framework for the preparation and application of a Sampling Plan; ■ CEN/TR 15310 1 Characterization of waste – Waste Collection – Part 1: Guide on the selection and application of criteria for sampling under various conditions; 	Waste fractions will be sent to alternative waste treatment facilities for further treatment. Composition of fractions will not be the focus of activities at Dartford and will instead be dealt with at receiving waste treatment facilities. Envva will be charged a fee by these external waste treatment facilities based on the purity of the received waste.	

¹⁴ <https://www.gov.uk/government/publications/waste-classification-technical-guidance>.

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ■ CEN/TR 15310 2 Characterization of waste – Waste Collection – Part 2: Guide on sampling techniques; ■ CEN/TR 15310 3 Characterization of waste – Waste Collection – Part 3: Guide on procedures for sub sampling in the field; ■ CEN/TR 15310 4 Characterization of waste – Waste Collection – Part 4: Guide to the packaging procedures for storage, conservation, transportation and delivery of samples; and ■ CEN/TR 15310 5 Characterization of waste – Sampling of waste – Part 5: Guide on the process of developing a sampling plan. Other guidance on waste sampling and analysis can be found in A10 Weeelabex de-pollution monitoring specification¹⁵. 		

Quality testing of fractions arising from recycling at the facility are not expected to be required as the residual materials that are to be produced will be transferred to different recycling / disposal outlets, which will not have specifications.

4.3.8. PROCESSED MATERIAL STORAGE

Processed materials will be stored in line with permit requirements, as well as adhering to FPP and HSE requirements. Residual materials that are expected comprise:

- Compressor oil;
- Refrigerants;
- Blowing agent;
- PUR foam;
- Ferrous metal;
- Non-ferrous metal;
- Plastic and rubber; and
- Mercury switches;

Reiterating earlier storage details, waste material storage in the yard will be strictly on covered impermeable areas, with sealed drainage surrounding. To prevent the build-up of stock, Enva will continue to implement the policy to dispatch material as soon as a load is available.

¹⁵ http://www.weelabex.org/wp-content/uploads/2019/09/a-10-weelabex-de-pollution-monitoring-specification_defrev_01_version-1_euro-b1801.pdf.

There will be maximum quantities of residual materials from various treatment streams. The capacities and storage timeframes for various residual materials are detailed in Table 3-16 and Table 3-17 details the waste generated from SMW treatment.

4.3.9. GENERAL POST-SHREDDING TREATMENTS AND POPS PLASTICS SEPARATION

Identified in SMW, display and cooling categories, plastics containing POPs are to be separated and removed, for storage in bags in covered storage areas with associated sealed drainage. They will then be sent to operators that are specialised to handle and separate the POPs plastics. Table 4-14 outlines post-shredding arrangements.

Table 4-14 - Guidance on Post-Shredding Treatments from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>A range of separation technologies may be used to further segregate and purify shredded fractions of WEEE. For example, eddy-current separators, electrostatic separators, and density separation, either at the shredding facility or elsewhere.</p>	<p>Following shredding, automatic segregation of fractions is carried out, to produce ferrous and several categories of non-ferrous fractions. A variety of methods are employed, in order to ensure segregation is carried out effectively and accurately. The following technologies are employed:</p> <ul style="list-style-type: none"> ■ A magnetic separator removes the steel ■ Electric motors to collect copper armatures ■ Eddy current separators are used on the small fraction initially to recover aluminium and non-ferrous material. ■ Eddy current separator then used to separate various grades of non-ferrous metal (aluminium, copper, brass, etc) 	<p>Yes</p>
<p>Fractions produced by the above processes must be fully characterised and classified.</p>	<p>Characterisation of fractions is discussed above. Enva are highly experienced in the recycling of WTEE and SMW and so have good understanding of the fractions that will be produced, without needing to characterise each one.</p>	
<p>Where materials originate from WEEE that was POPs waste, fractions of plastic containing brominated flame retardants must be managed as POPs waste.</p>	<p>Plastic components of WTEE are to be removed from the rear of the appliance and from the compressor, and these components are treated via a separate process (to separate plastics from metals). Plastics are treated as POPs plastics. Following mechanical treatment of SMW (includes items potentially containing POPs), plastics containing BFRs are removed.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
	All SMW plastics will be treated as POPs waste, along with POPs plastics from WTEE, which will have been manually removed as part of the compressor removal process. These POPs plastics will be transferred to an external waste treatment facility dedicated to plastics treatment.	
Where materials originate from WEEE that was not POPs waste, fractions of plastic containing brominated flame retardants must be assessed to determine if they are POPs waste.	There are not expected to be high volumes of fractions, produced at Dartford, that contain brominated flame retardants. However, in the event that there are, they will be stored in a designated area, under suitable weatherproof covering, awaiting dispatch to an external waste treatment facility.	
Process solutions and washings from density separation processes must be fully characterised and classified (including POPs) before determining suitable disposal options. Where these originate from the treatment of POPs waste, any POPs must be destroyed.	This does not take place at site.	N/A
Only waste codes for single material outputs must be used, e.g. where the treatment involved is aimed at producing a pure material fraction. Contamination by other materials must be negligible.	Contamination of outputs is expected to be negligible due to the measures in place with magnetic separation, eddy current separators etc and due to the pre-sorting protocols, that will be in place at the facility, prior to any mechanical treatment.	Yes
At least once every 3 months, how much BFR-containing plastic is present in any fraction destined for recycling must be monitored.	All POPs plastic outputs will be transferred off-site for treatment.	N/A

4.3.10. SECURE DESTRUCTION

Enva will continue to provide a secure destruction solution to customers, which may require some manual dismantling or sortation processes to group relevant materials together. Mechanical processing will form part of the secure destruction procedure. The key aspect to secure destruction will be that the processing will be logged in the Tegos system, with each load being differentiated.

4.3.11. OTHER EXITS

Those WEEE streams that cannot be recycled at the Dartford facility will be removed from site in bulk for recycling at other local waste treatment facilities, where further treatment will be provided as necessary. Tracking of waste, as detailed in Section 4.5, will also apply to those wastes leaving site for further treatment.

4.4. WASTE TYPES TO BE ACCEPTED

The types of waste expected to be accepted on site are outlined in this section, and are similar in nature to those accepted at Envva's Grantham WEEE recycling facility:

For activities that involve the treatment of waste temperature exchange equipment, involving stage 1 degassing and stage 2 destruction processes, as well as the storage of hazardous waste pending on-site treatment or off-site transfer, the following types of waste will be handled (Table 4-15):

Table 4-15 - Waste Codes Accepted for Waste Temperature Exchange Equipment Treatment and Hazardous Waste Storage Activities

Waste Code	Description
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST
16 02	Wastes from electrical and electronic equipment.
16 02 11*	Discarded equipment containing chlorofluorocarbons, HCFC, HFC.
16 02 13*	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12.
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
20 01	Separately collected fractions (except 15 01)
20 01 23*	Discarded equipment containing chlorofluorocarbons
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 3 containing hazardous components.

For activities that involve the mechanical treatment of SMW granulation of hazardous electrical and communications cable, and the storage of hazardous waste pending on-site treatment or off-site transfer, the below waste types will be handled (Table 4-16):

Table 4-16 - Waste Codes Accepted for SMW Treatment and Hazardous Waste Storage Activities

Waste Code	Description
09	WASTES FROM THE PHOTOGRAPHIC INDUSTRY
09 01	Wastes from the photographic industry
09 01 11*	Single-use cameras containing batteries included in 16 06 01, 16 06 02, or 16 06 03
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST

Waste Code	Description
16 02	Wastes from electrical and electronic equipment
16 02 09*	Transformers and capacitors containing PCBs.
16 02 10*	Discarded equipment containing or contaminated by PCBs other than those mentioned in 16 02 09.
16 02 12*	
16 02 13*	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12.
16 02 15*	Hazardous components removed from discarded equipment.
16 06	Batteries and accumulators
16 06 01*	Lead batteries
16 06 02*	Ni-Cd batteries
16 06 03*	Mercury-containing batteries
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 06	Insulation materials and asbestos-containing construction materials.
17 06 03*	Other insulation materials consisting of or containing hazardous substances.
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
20 01	Separately collected fractions (except 15 01)
20 01 21*	Fluorescent tubes and other mercury-containing waste.
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components.
20 01 36	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35.



For activities involving waste operations (such as storage of waste pending further operations, recycling / reclamation of organic substances not used as solvents, recycling / reclamation of metals and metal compounds, and recycling / reclamation or other inorganic compounds), the following waste types are handled (Table 4-17):

Table 4-17 - Waste Codes Accepted for a Variety of Waste Operations Activities

Waste Code	Description
09	WASTES FROM THE PHOTOGRAPHIC INDUSTRY
09 01	Wastes from the photographic industry
09 01 12	Single-use cameras containing batteries other than those mentioned in 09 01 11
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 02	Plastic packaging
15 01 03	Wooded packaging
15 01 04	Metallic packaging
15 01 05	Composite packaging
15 01 06	Mixed packaging
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST
16 01	End-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)
16 01 19	Plastic
16 02	Wastes from electrical and electronic equipment
16 02 14	Discarded equipment other than those mentioned in 16 02 09 to 16 02 13.
16 02 16	Components removed from discarded equipment other than those mentioned in 16 02 15
16 06	Batteries and accumulators
16 06 04	Alkaline batteries (except 16 06 03)
16 06 05	Other batteries and accumulators
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 04	Metals (including their alloys)

Waste Code	Description
17 04 01	Copper, bronze, brass
17 04 02	Aluminium
17 04 03	Lead
17 04 04	Zinc
17 04 05	Iron and steel
17 04 05	Tin
17 04 07	Mixed metals
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 12	Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 02	Ferrous metal
19 12 03	Non-ferrous metal
20	MUNICIPAL WASTE (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
20 01	Separately collected fractions (except 15 01)
20 01 23*	Discarded equipment containing chlorofluorocarbons.
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components.
20 01 36	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35.
20 01 40	Metals

4.5. WASTE TRACKING

As part of the onsite operations, waste tracking will be implemented, in line with Enva's Grantham site. Enva use a Microsoft Business Central system for centralised waste management (Tegos) to record data relating to waste, including the following information:

- Pre-acceptance information: there will be an agreement with each E-waste supplier as to the waste that the Dartford site will accept, which will be entered in the form of a contract and recording in Tegos;
- Acceptance information: Enva will track waste received and dispatched over a calibrated weighbridge at the proposed site and will use EA-approved protocols for mixed waste loads.

- Removal off site: all outbound materials will be dispatched over the weighbridge and records of waste type and the waste receiver will be kept on Tegos, with off-takers set up in Tegos, with agreed wastes in the form of a contract.

Weekly stock-take of all waste onsite will be conducted at the new WEEE facility, noting volumes of processed and un-processed wastes.

Table 4-18 shows the appropriate measures for waste tracking as outlined in EA guidance alongside the measures to be utilised on site. Enva are proposing alternative measures to those measures suggested by EA guidance, which meet the equivalent level of environmental protection, however, are more suitable for the waste operations that are to occur on site. The proposed arrangements are more suited to waste operations that involve inbound mixed WEEE loads being separated through division into reuse and waste treatment streams – ultimately, it becomes much more difficult to effectively track whole loads through the full waste operation. Proposed arrangements are detailed, below, alongside the suggested appropriate measures to highlight any differing approaches.

Table 4-18 - Guidance on Waste Tracking from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>A waste tracking system should be used to hold data information about the available capacity of the waste quarantine, reception, general and bulk storage areas of the facility, including treatment residues and end of waste product materials.</p>	<p>Enva will conduct weekly stock-takes to quantify volume of material held on site, which will be audited on an annual basis by independent auditors as part of year end processes. Records of all stock-takes will be retained electronically. Tegos can also be used to produce Mass Balance reports, which show the movement of ‘waste in’ and ‘waste out’ over any selected timeframe.</p>	<p>Yes</p>
<p>The waste tracking system must hold all information generated, during:</p> <ul style="list-style-type: none"> ▪ Pre-acceptance; ▪ Acceptance; ▪ Non-conformance or rejection; ▪ Storage; ▪ Treatment; and ▪ Removal off site. <p>This information must be readily accessible.</p>	<p>Enva’s Tegos Database will hold all the information generated during:</p> <ul style="list-style-type: none"> ▪ Pre-acceptance; ▪ Acceptance; and ▪ Removal off-site <p>Alternative measures are to be implemented at the Dartford site:</p> <p>A non-conformance log will be retained for non-conforming waste;</p> <p>Storage records will be maintained as part of weekly stock-take;</p> <p>Treatment records will be generated daily but will not be load specific. This is because not all waste on one trailer is treated via the same treatment route.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Records should be created and updated to reflect deliveries, on-site treatment and despatches – this can be done on a ‘loads received’ basis. The tracking system should also operate as a waste inventory and stock control system, including the following information as a minimum:</p> <ul style="list-style-type: none"> ▪ Date that the waste arrived on site; ▪ Producer’s details (or unique identifier); ▪ Unique reference number; ▪ Waste pre-acceptance and acceptance information; ▪ Quantity delivered; ▪ Intended treatment route; ▪ Accurate records of nature and quantity of wastes held on site, including all hazards (and identify primary hazards and presence of any regulated chemicals such as POPs); and ▪ Where the waste is physically located on site. 	<p>Enva will be able to create unique weighbridge records in the Tegos system which notes:</p> <ul style="list-style-type: none"> ▪ Date of arrival; ▪ Producers details; ▪ Weighbridge ticket number; ▪ Pre-acceptance and acceptance information; and ▪ Quantity and category of waste received or despatched. <p>Alternative measures:</p> <p>The intended treatment route will be determined by the nature of the material. Records of the nature and quantity held on-site will be captured in weekly stock-takes and independently audited by year end auditors.</p> <p>Stock will not be able to be tracked on-site on a ‘loads received’ basis, however, to demonstrate that waste will not be stored for longer than three months, Enva will retain evidence of bunker rotation through records. Bunkers will each have unique number and, every three months, each bunker will be emptied through a system of stock rotation which shows that the stock cannot be older than three months. Photographs of the empty bunkers will be taken every three months and retained as evidence.</p>	<p>Yes</p>
<p>The tracking system must be able to report:</p> <ul style="list-style-type: none"> ▪ Total quantity of waste present on site at any one time; ▪ Breakdown by type of the waste quantities being stored pending treatment or transfer; ▪ Quantity of waste on site compared with limits authorised by permit; ▪ Length of time the waste has been on site; and ▪ Quantity of end-of-waste product materials on site at any one time and detail of any non-conformances and rejections, where applicable. 	<p>The weekly stock-take will record the following details:</p> <ul style="list-style-type: none"> ▪ Total quantity of waste on site at any one time; ▪ Breakdown by type of the waste quantities being stored pending treatment or transfer; and ▪ Quantity of waste on-site compared with the limits authorised by permit. <p>Enva’s Management Information System tracking individual appliances through reuse will maintain a live stock register of all end-of-waste items on site at any one time. This will be independently audited annually by year end auditors.</p> <p>Alternative measures:</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
	Stock will not be able to be tracked on-site on a 'loads received' basis, however, to demonstrate that waste will not be stored for longer than three months, Enva will retain evidence of bunker rotation through records. Bunkers will each have unique number and, every three months, each bunker will be emptied through a system of stock rotation which shows that the stock cannot be older than three months. Photographs of the empty bunkers will be taken every three months and retained as evidence.	
Back-up copies of electronic records should be stored off-site. Records must be readily accessible in an emergency.	All electronic files will be securely backed up to the cloud.	Yes
Pre-acceptance and acceptance records must be kept for a minimum of two years after you have treated the waste or removed it off site. Some records may have to be kept for longer if they are required for other purposes, e.g. hazardous waste consignment notes.	Pre-acceptance and acceptance records will be stored for a period of 7 years, once waste has been treated / removed from site.	Yes

Residual materials produced from recycling activities on site will be supported by record keeping arrangements, too. These are outlined below in Table 4-19.

Table 4-19 - Guidance on Record keeping of all treatment residues from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>The following must be recorded in the waste tracking system:</p> <ul style="list-style-type: none"> ▪ That the WEEE has been treated or consigned to another WEEE treatment facility; ▪ What WEEE has been prepared for reuse or has been consigned to a preparing for reuse operator; and ▪ What the treatment residues, treated components and fractions are. 	Using Tegos, all required information in relation to treatment and handling of waste can be stored and logged, so that effective tracking of the materials on site can be carried out.	Yes

5. EMISSIONS AND MONITORING

5.1. OVERVIEW OF SECTION AND MONITORING ARRANGEMENTS

Throughout this section, emissions from the site will be outlined, alongside a description of measures that will be utilised for the management and monitoring of relevant emissions for this proposed development. Monitoring arrangements that are to be implemented at the proposed site are outlined below in Table 5-1.

Table 5-1 - Monitoring Arrangements

Emissions	Proposed Monitoring Arrangements
Emissions to Air (point source)	The frequency of monitoring of each of the point source emissions to air at the Dartford facility are stated in Table 5-7.
Emissions to Surface Water (point source)	The frequency of monitoring of each of the point source emissions to water at the Dartford facility are discussed in Section 5.1.2.
Emissions to Sewer	The frequency of monitoring of each of the point source emissions to sewer at the Dartford facility are discussed in 5.1.2.
Waste Emissions	Throughput of the plant will be monitored on an hourly basis, referring to WTEE processed per hour, or tonnes of SMW per hour. Other measures that will be monitored at the facility, by the plant, will be the amount of gas capture, including CFC gases, and the amount of blowing agent recovered.
Noise Emissions	Perimeter noise surveys will be carried out on an annual basis, in line with monitoring standard BS 4142:2014.
Odour Emissions	N/A

Below, BAT requirements and appropriate measures for monitoring are outlined alongside details on how the proposed operational measures meet requirements.

5.1.1. POINT SOURCE EMISSIONS TO AIR MONITORING

Monitoring of point source emissions to air will be conducted at the Dartford facility, to provide understanding of the impacts of the activities on the surrounding environment. There will be a total of three point source emissions to air arising from Unit 6 in relation to recycling activities. Each will be supported by appropriate abatement measures, which are discussed in further detail in Section 5.2. These emission points will be monitored as appropriate, with arrangements for this detailed below in Table 5-2.

Table 5-2 - Guidance on Emissions Monitoring and Limits - Point Source Emissions to Air from WEEE Appropriate Measures for Permitted Facilities Guidance

Appropriate Measures	Proposed Arrangements	Appropriate Measure?
<p>The facility's emissions inventory must include information on relevant characteristics of point source emissions to air, including:</p> <ul style="list-style-type: none"> ▪ average and variability in flow and temperature; ▪ average and load values of relevant substances and their variability; ▪ flammability, lower and higher explosive limits and reactivity; and ▪ presence of other substances that may affect waste gas treatment system or plant safety (e.g. oxygen, nitrogen, water vapour, dust) 	<p>The emissions inventory will be calculated annually based on emissions testing conducted throughout the year. The inventory will include the requirements as listed.</p>	<p>Yes</p>
<p>Monitoring locations must meet MCERTS standards. Monitoring must be carried out using MCERTS qualified accredited methods and MCERTS certified staff.</p>	<p>Point source emission monitoring will be conducted to align with MCERTS standards and be undertaken by MCERTS certified staff.</p>	<p>Yes</p>
<p>Emissions monitoring must be carried out when the plant is operating at or near to full treatment capacity. Information regarding the plant treatment processing rate and air flow rate at the time of monitoring must be recorded and submitted with the monitoring results.</p>	<p>Emissions monitoring will be conducted at the point source emission locations whilst the plant is operational, so as to reflect the normal operating conditions at the facility.</p>	<p>Yes</p>
<p>Point source emissions to air should be monitored for the following substances, given in the table below (Table 5-3). Monitor at the frequencies stated and meet the specified emission limits unless the permit states alternated requirements.</p>	<p>All emissions monitoring will be undertaken in accordance with the methods and frequencies detailed in Table 5-3 below.</p>	<p>Yes</p>

The frequency of monitoring will be key to ensuring a good understanding of plant performance and environmental impact is maintained throughout the operation of the facility. The anticipated routine for monitoring is detailed in **Table 5-3**. Monitoring will be carried out for an initial 12 months in order to define the emissions inventory.

Table 5-3 - Frequency of Monitoring Emissions to Air from WEEE Appropriate Measures for Permitted Facilities Guidance

Substance / Parameter	Standard(s)	Monitoring Frequency	Emission Limit
Dust	EN 13284-1	Every 6 months	5 mg / m ³ (where inappropriate to fit a fabric filter due to potential deflagration effects on the filter, limit is 10 mg / m ³)
TVOC	EN 12619	Every 6 months	-
Dioxin-like PCBs *	EN 1948-1, -2 and -4	Every 12 months	-
PCDD/F*	EN 1948-1, -2 -3	Every 12 months	-
BFRs*		Every 12 months	-
Metals and metalloids excluding mercury*	EN 14385	Every 12 months	-
Total mercury**	EN 13211	Every 3 months	7 µg / m ³

*If deemed relevant to be monitored for based on facility's emissions inventory.

**If WEEE treated containing mercury

Monitoring of point source emissions to air must also comply with the relevant BAT requirements related to Waste Treatment (Table 5-4), in relation to both arrangements and frequency of monitoring (Table 5-5).

Table 5-4 - BAT Requirements for Monitoring Emissions to Air from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangements	BAT?
BAT 8: BAT is to monitor channelled emissions to air with at least the frequency given below (in Table 5-5), and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	All emissions monitoring will be undertaken in accordance with the methods and frequencies detailed in Table 5-5 below.	Yes

Monitoring carried out within the first 12 months of site operations will be used to support the development of an emissions inventory. Such monitoring will be in line with arrangements included below.

Table 5-5 - Monitoring Frequencies from Waste Treatment BREF (August 2018)

Substance / Parameter	Standard(s)	Waste Treatment Process	Minimum Monitoring Frequency
Brominated flame retardants	No EN standard available	Mechanical treatment in shredders of metal waste	Once every year
CFCs	No EN standard available	Treatment of WEEE containing VFCs and/or VHCs	Once every year
Dioxin-like PCBs	EN 1948-1, -2, and -4	Mechanical treatment in shredders of metal waste	Once every year
		Decontamination of equipment containing PCBs	Once every three months
Dust	EN 13284-1	Mechanical treatment of waste	Once every six months
Hg	EN 13211	Treatment of WEEE containing mercury	Once every three months
Metals and metalloids except mercury (e.g. As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Ti, V)	EN 14385	Mechanical treatment in shredders of metal waste	Once every year
NH ₃	No EN standard available	Physico-chemical treatment of solid and/or pasty waste	Once every six months
PCDD/F	EN 1948-1, -2 and -3	Mechanical treatment in shredders of metal waste	Once every year
TVOC	EN 12619	Mechanical treatment in shredders of metal waste	Once every six months

Substance / Parameter	Standard(s)	Waste Treatment Process	Minimum Monitoring Frequency
		Treatment of WEEE containing VFCs and/or VHCs	Once every six months
		Decontamination of equipment containing PCBs	Once every three months

5.1.2. POINT SOURCE EMISSION TO WATER OR SEWER MONITORING

There are no process emissions to water or sewer, therefore monitoring of this is not required.

5.2. POINT SOURCE EMISSIONS TO AIR

Emissions to air are controlled to minimise the release of harmful substances to the environment. Emissions control systems are to be regularly cleaned and inspected to ensure efficient functioning as part of the preventative maintenance programme. Regular emissions testing, in accordance with Table 5-6 below, will be undertaken to ensure that emissions remain within proposed limits.

There will be a total of 5 emission points within the facility, with only 3 of these releasing to air and constituting point source emissions. Each emission point will be fitted with appropriate abatement, depending on the nature of emissions. The emission points are detailed in Table 5-6:

Table 5-6 - Emission Points

Emission Point	Description	Point Source Emission to Air
Central de-dusting system	From the SMW recycling plant	Yes
Blowing agent recovery system	Part of the WTEE recycling process	Yes
Degassing exhaust pipe	Part of the WTEE recycling process	Yes
Filter metal separation	Within the WTEE recycling unit	No
Individual discharge ducts	For safety valves and ventilation	No

An Air Emissions Risk Assessment was undertaken considering only those classed as point source emissions to air and considered only those parameters that were anticipated to be in the discharge composition. As the recycling facility is not yet under operation, an emissions inventory is yet to be compiled. Emissions will be monitored, and an inventory is to be developed accordingly.

Further detail on the emission points is included in the Table below, highlighting key information such as the location of the release point, the nature of emissions and the form of abatement to be used, to aid in the determination as to whether further consideration is required.

Table 5-7 - Point Source Emissions to Air

Location	Abatement Measures	Relevant Emission	Proposed Limits	Monitoring Frequency
Central de-dusting system (SMW)	Bag filters	Dust	5 mg / m ³	6 monthly
		Total VOCs	15 mg / m ³	6 monthly
Blowing agent recovery system	Scrubber	Dust	5 mg / m ³	6 monthly
		Total VOCs	15 mg / m ³	6 monthly
Degassing exhaust pipe	HEPA filter	Dust	5 mg / m ³	6 monthly
		Total VOCs	15 mg / m ³	6 monthly

Taken from the guidance, the table below (Table 5-8) outlines the appropriate measures that should be taken to control point source emissions to air.

Table 5-8 - Guidance on Point Source Emissions to Air from WEEE Appropriate Measures for Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
The waste treatment process should be contained to make sure that all process emissions are collected, extracted and directed to an appropriate abatement system for treatment before release.	The two deconstruction processes are within the building and emissions from these are contained and directed to appropriate emission points, fitted with suitable abatement measures.	Yes
The main chemical constituents of the site's point source emissions should be identified as part of the site's inventory of emissions to air. Speciation of volatile organic compounds (VOCs), if identified and if practicable to do so, should be included in the emissions inventory.	The main anticipated emissions with regards to permitted limits are detailed in Table 5-6 above. A full inventory can be reviewed after first year of operation and stack testing.	Yes
The fate and impact of substances emitted to air should be assessed in line with the EA's air emissions risk assessment methodology ¹⁶ .	An air emissions risk assessment has been undertaken and supports this application. See Section 6.	Yes

¹⁶ <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>.

Requirements	Proposed Arrangements	Appropriate Measure?
<p>In order to reduce emissions to air from the treatment of waste, an appropriate combination of abatement techniques should be used, including one or more of the following systems:</p> <ul style="list-style-type: none"> ▪ Adsorption ▪ Fabric filter ▪ Wet scrubbing ▪ HEPA filter ▪ Condensation and cryogenic condensation ▪ Cyclone ▪ Electrostatic precipitator (ESP) ▪ Thermal oxidation 	<p>The abatement techniques to be utilised for each point source emission to air are included in Table 5-7.</p>	<p>Yes</p>
<p>Vent and stack locations should be assessed and designed to ensure adequate dispersion capability.</p>	<p>Design of the recycling facility will consider the most appropriate vent and stack locations.</p>	<p>Yes</p>
<p>Suitable monitoring points should be installed where monitoring is required (including for odour), meeting MCERTS standards.</p>	<p>Monitoring will be in line with relevant standards.</p>	<p>Yes</p>
<p>Procedures should ensure that installation, operation, monitoring and maintenance of abatement equipment is carried out correctly, including monitoring and maintenance of:</p> <ul style="list-style-type: none"> ▪ Appropriate flow and chemical concentration of scrubber liquor. ▪ Handling and disposal or regeneration of spent scrubber or filter medium. 	<p>All abatement measures will be maintained and cleaned in accordance with manufacturers recommendations. The operation of the equipment and abatement will be by a PLC-based system.</p>	<p>Yes</p>

5.3. POINT SOURCE EMISSIONS TO WATER

Point source emissions to water proposed at this development include the following:

Table 5-9 - Point Source Emissions to Water

Point Source Emission	Location	Nature of Emissions	Abatement Measures	Monitoring Frequency
To surface water	W1 on drainage plan	Surface water from roofs, roadways and storage areas.	Oil interceptor and attenuation tank.	None
To foul sewer	S1 on drainage plan	Domestic effluent	None	None

Taken from the guidance, the table below (Table 5-10) outlines the appropriate measures that should be taken to control point source emissions to water and sewer.

Table 5-10 - Guidance on Point Source Emissions to Water from WEEE Appropriate Measures for Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measures?
The main chemical constituents of the point source emissions to water and sewer should be identified as part of the site's inventory of emissions.	There are no process emissions to water or sewer from the installation.	N/A
The fate and impact of substances emitted to water and sewer should be assessed in line with the EA's risk assessment guide ¹⁷ .	There are no process emissions to water or sewer from the installation.	N/A
Discharges to water or sewer comply with the conditions of an environmental permit or trade effluent consent, except for uncontaminated surface water (e.g. roof drainage). Relevant sources of waste water include (but are not limited to): <ul style="list-style-type: none"> ▪ Water or condensate collected from treatment processes ▪ Waste compactor run-off ▪ Vehicle washing ▪ Vehicle oil and fuel leaks ▪ Washing of containers ▪ Spills and leaks in waste storage areas ▪ Loading and unloading areas ▪ Uncovered storage areas 	There are no process emissions to water or sewer from the installation.	N/A

¹⁷ <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>.

Requirements	Proposed Arrangements	Appropriate Measures?
Prevent the release of POPs to water or sewer by storing these wastes (such as shredded WEEE plastic or granulated cable) and any other shredded POPs in waste under weatherproof covering, as POPs may leach or wash out in particulates if exposed to the weather.	POPs waste will be stored in bags, under weatherproof covering, or in trailers with weatherproof covering, to prevent fugitive release to water or sewer.	Yes
<p>In order to reduce emissions to water and sewer, if treatment of waste water is required before discharge or disposal, an appropriate combination of treatment techniques should be used, including one or more of the following:</p> <ul style="list-style-type: none"> ■ Preliminary or primary treatment (e.g. equalisation, neutralisation or physical separation) ■ Physico-chemical treatment (e.g. adsorption, distillation or rectification, precipitation, chemical oxidation or reduction, evaporation, ion exchange or stripping) ■ Biological treatment (e.g. activated sludge process or membrane bioreactor) ■ Nitrogen removal (e.g. nitrification and denitrification) ■ Solids removal (e.g. coagulation and flocculation, sedimentation, filtration or flotation) 	There will not be any anticipated requirement for treatment of wastewater on site as there will be no process waters created.	N/A

Measures related to point source emissions to water also need to comply with BAT conclusions relating to Waste Treatment: these are outlined below.

Table 5-11 - BAT Requirements for Emission to Water from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangements	BAT?
<p>BAT 19: In order to optimise water consumption, to reduce the volume of waste water generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques given below.</p> <ul style="list-style-type: none"> ■ Water management ■ Water recirculation ■ Impermeable surface 	Water consumption is not anticipated to be a concern at the facility as it is not required for any activities on-site and will only be required to supply welfare facilities. There will be no process water required for recycling activities.	N/A

BREF Requirements	Proposed Arrangements	BAT?
<ul style="list-style-type: none"> ■ Techniques to reduce the likelihood and impact and overflows and failures from tanks and vessels ■ Roofing of waste storage and treatment areas ■ Segregation of water streams ■ Adequate drainage infrastructure ■ Design and maintenance provisions to allow detection and repair of leaks ■ Appropriate buffer storage 		
<p>BAT 20: In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given below.</p> <p>Equalisation</p> <p>Neutralisation</p> <p>Physical separation, e.g. screens, sieves, grit separators, grease separators, oil-water separation or primary settlement tanks</p> <ul style="list-style-type: none"> ■ Adsorption ■ Distillation/rectification ■ Precipitation ■ Chemical oxidation ■ Chemical reduction ■ Evaporation ■ Ion exchange ■ Stripping ■ Activated sludge process ■ Membrane bioreactor ■ Nitrification / denitrification when the treatment includes a biological treatment ■ Coagulation and flocculation ■ Sedimentation ■ Filtration (e.g. sand filtration, microfiltration, ultrafiltration) ■ Flotation <p>BAT-associated emission levels are included in the BREF document.</p>	<p>There will not be any anticipated requirement for treatment of wastewater on site as there will be no process waters created.</p>	<p>N/A</p>

5.4. EMISSIONS OF SUBSTANCES NOT CONTROLLED BY EMISSION LIMITS

5.4.1. FUGITIVE EMISSIONS TO WATER

The table below details indicative BAT requirements for fugitive emissions from GOV.UK guidance¹⁸:

Table 5-12 - Guidance on Fugitive Emissions to Land and Water from Appropriate Measures for WEEE Permitted Facilities.

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Emissions to water:</p> <ul style="list-style-type: none"> ■ Site surfaces, including roofs, hard standing, working areas, any containment structures required by the permit, such as bunds or other secondary containment measures, and the site drainage infrastructure, will prevent pollution to surface water and groundwater. ■ Consider collection capacities, surface thicknesses, strength and reinforcement, falls, materials of construction and permeability. ■ Ensure rainfall collection systems are kept separate from areas of the site which are or may be contaminated. ■ Surfaces and containment or drainage facilities must be resistant to spilled chemicals. A plan should be included in the management system detailing how surfaces and containment facilities will be inspected and maintained. <p>The following measures should be incorporated to prevent contaminated run-off polluting ground water or surface waters:</p> <ul style="list-style-type: none"> ■ A waterproof surface ■ Spill containment kerbs ■ Sealed construction joints. 	<p>All operational areas will be on impermeable surfaces designed to prevent any release to ground. This considers the duty of the area and the appropriate thickness of the surface to enable safe operation by fixed and mobile plant.</p> <p>All bunds are to be appropriately sized and will be maintained in accordance with the maintenance programme for site infrastructure.</p> <p>Rainfall from clean areas of the site will be kept separate from dirty areas of the site.</p> <p>All external bays for the storage of the recyclate will be covered to prevent contact with rainfall.</p> <p>The surfacing will be impermeable and waterproof, have spill containment kerbs and have sealed construction joints.</p> <p>The drainage system includes for a collection tank with a penstock valve to prevent any releases due to accidents or firewater.</p>	<p>Yes</p>

¹⁸ <https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit>.

Requirements	Proposed Arrangements	Appropriate Measure?
<p>A sealed drainage system must:</p> <ul style="list-style-type: none"> ▪ Collect any liquid that passes through the drainage system in a sealed sump (collection pool) (unless a permit is in place to discharge the liquid). ▪ Dispose of collected liquid through a treatment facility or have it collected by a specialist waste disposal company. <p>If the operation causes pollution, it is essential to:</p> <ul style="list-style-type: none"> ▪ Clean up the pollution as soon as possible ▪ Stop the activity until the operation has been changed to prevent future pollution ▪ Inform the EA (via methods outlined in permit). 		
<p>Leaks from Containers</p> <ul style="list-style-type: none"> ▪ Leaks or accidental release of liquids that could cause pollution from tanks, sumps, containers and bunds must be prevented. ▪ The site must be designed so that leaks from underground structures are prevented, and any leaks can be detected quickly ▪ Records of the route of any underground drains or pipework on site must be kept. ▪ If oil is used in operations, oil separators must be fitted to surface water drainage systems and maintained, to prevent discharges being contaminated by oil. ▪ Containment (bunding) must be provided for underground pipework, sumps and storage vessels. A leak detection system may also need to be fitted, particularly if activities are being carried out in a groundwater source protection zone. ▪ A list of any underground sumps or storage vessels must be kept 	<p>Any tanks containing waste oils will be bunded. Any other liquids that are to be stored in containers will be stored on bunds, preventing any leaks that may occur from leaking into the environment and causing harm.</p> <p>The site has a drainage plan in place which identifies surface and foul drainage.</p> <p>The underground drainage structures are newly constructed and will be included with the site infrastructure maintenance programme.</p> <p>Surface water run-off will be directed by site drainage into the underground holding tank, via an oil interceptor. This tank will be surrounded with sufficient concrete to counter floatation and shall have adequate wall thickness for resisting the highest groundwater level which could be encountered at its location. This will help to prevent any leachate into groundwater in the event of a leak in the tank.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ Sumps and bunds must be waterproof and resistance to any materials to be stored within them. ▪ Sumps and bunds should not become contaminated or blocked as this may cause them to leak. <p>The following must be undertaken:</p> <ul style="list-style-type: none"> ▪ Check that sumps and bunds are working correctly (e.g. there are no cracks) ▪ Hydraulically test any sump or bund that that there are concerns that it is not working properly ▪ Fit a high-level probe to any sumps or bunds cannot be checked with an alarm <p>Bunds must have a capacity larger than both of the following (use the maximum volume that a tank can physically hold when calculating capacity):</p> <ul style="list-style-type: none"> ▪ 110 % of the largest tank the bund is protecting; ▪ 25 % of the combined volume of all the tanks that the bund is protecting. <p>Bunds must also:</p> <ul style="list-style-type: none"> ▪ Have no outlets; ▪ Drain to a blind collection point; ▪ Have self-contained pipework that is separate from the container pipework; and ▪ Have tanker connection points within the bund or otherwise tanker connection points must be contained. <p>Storage areas must:</p> <ul style="list-style-type: none"> ▪ Be bunded or kerbed if storing any environmentally harmful substances. 		

Requirements	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ▪ Store substances separately if there is a risk when storing them too close together. ▪ Not use plastic intermediate bulk containers to store flammable materials. ▪ Be located away from watercourses, sensitive groundwater areas such as Source Protection Zone 1, unprotected drainage systems and sensitive boundaries. ▪ Be clearly marked, along with the containers and packages in them. ▪ Have the maximum storage capacities defined and be adhered to. ▪ Store containers with lids, caps and valves secured, including empty containers. ▪ Be inspected at least once a week to check for damaged or leaking containers, drums or small packages, with a procedure in place to replace or repair any damaged or leaking containers. 		
<p>In all operational areas of the facility, there must be:</p> <ul style="list-style-type: none"> ▪ An impermeable surface; ▪ Sealed construction joints; and ▪ Spill containment kerbs. 	<p>All operational areas of the facility will have an impermeable surface, sealed construction joints and spill containment kerbs.</p>	<p>Yes</p>
<p>For outdoor operational areas, there must also be a sealed drainage system.</p>	<p>A sealed drainage system will be implemented on site. The site drainage layout is included within this document in Appendix C.</p>	<p>Yes</p>
<p>The sealed drainage system must collect all surface water run-off and channel it to a blind sump unless it may be lawfully discharged to water or sewer.</p>	<p>Surface water run-off will be collected in surface water drains on site, which will direct the run-off into an underground holding tank, via an oil interceptor. This holding tank is fitted with penstock valves that can be deployed to stop flow in the event of suspected contamination.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measure?
Each water stream generated at the facility must be collected and treated separately. Separation must be based on pollutant content and treatment required. Uncontaminated water streams must be segregated from those that require treatment.	There is no process water generated at the facility only surface water and domestic foul effluent which are kept separate.	Yes
Suitable drainage infrastructure must be used to collect surface drainage from areas of the facility where waste is stored, handled and treated. Washing water and occasional spillages must also be collected.	Surface water drainage will be implemented, which will collect all run-off and direct to an underground holding tank, via an oil interceptor. Testing of the contents of the holding tank can be undertaken, combined with the use of the penstock valves to prevent environmental contamination.	Yes
Depending on pollutant content, one of the following must be carried out: <ul style="list-style-type: none"> ▪ Recirculate what has been collected; ▪ Discharge it in accordance with an environmental permit or trade discharge consent; and ▪ Send it for further treatment. 	In the event of a pollution incident, run-off collected in the holding tank will be tested to determine if it can be discharged from the holding tank as normal, or if removal via tanker for further treatment off-site will be required.	Yes
Design and maintenance provisions must be in place to detect and repair leaks, including regular monitoring, inspecting and repairing equipment and infrastructure.	All site infrastructure will be included within the maintenance programme. Any identified defects would be addressed as soon as practicable after being identified.	Yes
Appropriate buffer storage capacity should be provided at the facility to store waste waters, taking into account: <ul style="list-style-type: none"> ▪ Potential abnormal operating scenarios and incidents; and ▪ The nature of any polluting substances and their impact on the downstream waste water treatment plant and receiving environment. 	All containers storing liquids on site will be supported by suitable bunding and will be located on impermeable hardstanding surfaces.	Yes
Appropriate measures must be in place for monitoring, treating and reusing the water held in the buffer storage before discharging.	All surface water run-off will be directed to an underground holding tank (with a capacity of 1000 m ³), via an oil interceptor. Whilst in	Yes

Requirements	Proposed Arrangements	Appropriate Measure?
	this holding tank, there will be an opportunity for sampling to be carried out to ensure that run-off can be discharged as planned, or if removal via tankers for treatment will be required.	
<p>Measures must be taken to prevent emissions from washing and cleaning activities, including:</p> <ul style="list-style-type: none"> ▪ Directing liquid effluent and wash waters to foul sewer or collecting them in a sealed system for off-site disposal – they must not be discharged into surface or storm drains; ▪ Where possible, using biodegradable and non-corrosive washing and cleaning products; ▪ Storing all detergents, emulsifiers and other cleaning agents in suitable bunded or containment facilities, within a locked storage area, or in a building away from surface water drains; and ▪ Preparing cleaning or disinfection solutions in contained areas of the site and never in areas that drain to the surface water system. 	Due to the nature of the waste to be handled at the facility (WEEE) and recycling activities that will be undertaken, it would not be considered suitable to introduce water into the process, for cleaning purposes. Instead, the equipment to be used for recycling will have built-in self-cleaning. Furthermore, the main aspect that would require cleaning activities would dust generation: dry cleaning by vacuum is to be performed at the facility. Therefore, these provisions are not relevant to the activities to be undertaken at Dartford.	N/A
Where relevant, measures to prevent pollution from the on-site storage, handling and use of oils and fuels must be in place. Follow EA guidance on oil storage regulations for businesses ¹⁹ .	All liquids on site, including oils and fuels, will be stored in secure containers, on suitable bunds and will be located on impermeable hardstanding surfaces. A full breakdown of containment measures is provided in the SCR, which is appended to this report (Appendix D)	Yes
A spillage response plan must be produced and implemented, and staff should be trained to follow and test it.	A spillage response plan will be incorporated into the procedures at the facility. This will be included in the training that Enva staff are to receive and will be reviewed regularly, to ensure relevance.	

¹⁹ <https://www.gov.uk/guidance/storing-oil-at-a-home-or-business>.

Requirements	Proposed Arrangements	Appropriate Measure?
Procedures and associated training must make sure that spillages are dealt with immediately.	Absorbent materials and spill kits will be readily available for the treatment of any spillage. Instances of spillage will be recorded and records maintained. Staff will receive appropriate training on response to spills and appropriate use of spill kit materials.	Yes
Spill kits must be kept at locations close to areas where a spillage could occur and make sure relevant staff know how to use them. Make sure kits are replenished after use.	Spill kits will be available in various locations across the site, particularly where spillages could occur. Staff will receive appropriate training on response to spills and appropriate use of spill kit materials, including replenishing after use.	Yes
Measures should be taken to stop spillages from entering drains, channels, gullies, watercourses and unmade ground. Proprietary sorbent materials, sand or drain mats should be made available for use when required.	Absorbent materials and spill kits will be readily available for the treatment of any spillage. Instances of spillage will be recorded and records maintained. Furthermore, if a spillage does happen to enter surface run-off drains on site, a penstock valve can be deployed at the holding tank stage, into which site surface run-off is diverted.	Yes
The spillage response plan must include information about how to recover, handle and correctly dispose of waste produced from a spillage.	A suitable spillage response plan will be implemented by Enva at the site.	Yes

Fugitive emissions to water are reviewed under four areas, as follows:

- Sub-surface structures and sumps;
- Surfacing;
- Bunds / secondary containment; and
- Storage areas

5.4.1.1. Sub-Surface Structures and Sumps

Within the table below (Table 5-13), arrangements are provided in relation to all the new sub-surface structures associated with the environmental permit application for the site.

Table 5-13 - Guidance on Fugitive Emissions to Land and Water - Designing and Maintaining Sub-Surface Structures from Appropriate Measures for WEEE Permitted Facilities

Requirement	Proposed Arrangements	Appropriate Measure?
<p>The routing of all site drains and sub-surface pipework must be established and recorded.</p> <p>All sub-surface sumps and storage vessels must be identified.</p> <p>Systems must be engineered to minimise leakages from pipes and make sure they are detected quickly if they do occur, particularly where hazardous substances are involved.</p> <p>Secondary containment or leakage detection must be provided for sub-surface pipework, sumps and storage vessels.</p> <p>An inspection and maintenance programme must be established for all sub-surface structures, for example, pressure tests, leak tests, material thickness checks or CCTV.</p>	<p>The site has in place a drainage diagram which identifies all sub surface drainage as well as a below ground water collection tank. Integrity of such structures will be monitored via 5-yearly CCTV camera surveillance images.</p> <p>All site infrastructure will be included in the maintenance programme. There will be no other sump structures at the facility, apart from the holding tank for surface water drainage.</p>	
<p>An inspection and maintenance programme must be implemented for containment facilities.</p>	<p>All site infrastructure will be included in the maintenance programme.</p>	<p>Yes</p>

5.4.1.2. Surfacing

All new surface finishes and arrangements proposed on site associated with this application are detailed in the table (Table 5-14) below. Across the facility, impermeable hardstanding concrete surfaces will be used.

Table 5-14 - Guidance on Fugitive Emissions to Land and Water - Designing and Maintaining Surfacing from Appropriate Measures for WEEE Permitted Facilities

Requirement	Proposed Arrangements	Appropriate Measure?
<p>Appropriate surfacing and containment or drainage facilities must be designed for all operational areas, taking into account:</p> <ul style="list-style-type: none"> ▪ Collection capacities; ▪ Surface thicknesses; ▪ Strength and reinforcement; ▪ Falls; ▪ Materials of construction; ▪ Permeability; ▪ Resistance to chemical attack; and ▪ Inspection and maintenance procedures. 	<p>All operational areas will be on impermeable surfaces designed to prevent any release to ground. This considers the duty of the area and the appropriate thickness of the surface to enable safe operation by fixed and mobile plant.</p> <p>The surfacing will be resistant to chemicals, although the site does not use significant quantities.</p>	Yes
<p>An inspection and maintenance programme must be implemented for impermeable surfaces.</p>	<p>All site infrastructure will be included in the maintenance programme.</p>	Yes

5.4.1.3. Bunds / Secondary Containment

As detailed in the SCR (attached to this report in Appendix D), the only tank that is anticipated to be stored on site will contain ULSG. This tank will have an inner skin and will be self-bunded. Other liquid materials will be stored in much smaller quantities (for maintenance applications) and will be stored on pallets, supported by suitable bunding. Proposed arrangements related to this are detailed below, in **Table 5-15**, against appropriate measures taken from guidance.

Table 5-15 - Guidance on Fugitive Emissions to Land and Water - Tanks and Bunding from Appropriate Measures for WEEE Permitted Facilities

Requirement	Proposed Arrangements	Appropriate Measure?
<p>All above ground tanks containing liquids whose spillage could be harmful to the environment must be bunded.</p> <p>Bunds must:</p> <ul style="list-style-type: none"> ▪ Be impermeable and resistance to the stored materials ▪ Have no outlet (that is, drains or taps) and drain to a blind collection point ▪ Have pipework routed within bunded areas with no penetration of contained surfaces 	<p>All above ground tanks, see Site Condition Report Section 5.1, will be bunded and will be designed to 110% of the largest tank or 25% of the total tankage.</p> <p>Pipework will be located within the bund and there will be no penetration of the bund walls.</p> <p>All bunds will be included within the infrastructure maintenance programme.</p> <p>ULSG will be stored in a self-bunded tank that has an inner skin. This is the main liquid that will be stored at the facility.</p>	Yes

Requirement	Proposed Arrangements	Appropriate Measure?
<ul style="list-style-type: none"> ■ Be designed to catch leaks from tanks or fittings ■ Have a capacity greater than 110% of the largest tank or 25% of the total tankage, whichever is the larger ■ Have regular visual inspections – any contents must be pumped out or otherwise removed under manual control after checking for contamination ■ Be fitted with a high-level probe and an alarm (as appropriate) if not frequently inspected ■ Have tanker connection points within the bund (where possible), otherwise provide adequate containment ■ Have programmed engineering inspections – normally visual, but extending to water testing if structural integrity is in doubt ■ Be emptied of rainwater regularly to maintain their containment capacity. 	<p>Other liquids that will be stored will be those used for maintenance and engineering purposes only. Such substances will be stored in small containers and will be located on suitable bunded pallets.</p> <p>There will be no other liquids that could cause harm to the environment stored at the facility, as recycling activities will feature solid materials only.</p>	

5.4.1.4. Storage Areas

Planned storage areas and supporting arrangements on site are outlined in this section and in Table 5-16. Containment measures will be implemented across the site, as appropriate.

Table 5-16 - Guidance on Storage Areas from GOV.UK Guidance

Requirements	Proposed Arrangements	BAT?
<p>Storage areas must:</p> <ul style="list-style-type: none"> ■ Be located away from watercourses, sensitive groundwater areas, unprotected drainage systems and sensitive boundaries; ■ Be clearly marked and ensure any containers within them are clearly marked; ■ Define the maximum storage capacities for each storage area and container; ■ Have containers stored securely with lids, caps and valves in place; and ■ Be inspected at least once a week to check not damaged. 	<p>All storage areas will be located away from sensitive receptors and features, as required.</p> <p>All liquids stored on site will be in secure containers, clearly labelled, and such containers will be stored on appropriate bunds to prepare for the event of a leak or spill, as described above. All bunding is inspected as part of Enva engineers' maintenance and inspection programmes, which will occur on a regular basis, to ensure that any defects are notified at an early stage and rectified. Storage bays will be clearly labelled with regard to what is to be stored within.</p> <p>All surfaces on site will consist of impermeable concrete hardstanding, protecting ground beneath in the event of</p>	

Requirements	Proposed Arrangements	BAT?
	<p>any spillages. All storage required to support the WTEE recycling process will be contained within the main building.</p> <p>Surface water run-off is to be directed to a holding tank that, which will include a penstock valve. This can be activated in the event of an incident, to protect the environment and prevent the escape of any contaminants.</p> <p>Internal storage bay capacity is broken down into the type of material being stored:</p> <ul style="list-style-type: none"> ■ There will be 12 bays (each with dimensions 10 m x 12 m x 3.6 m) for storage of WTEE pending recycling, each holding 745 appliances, meaning a total of 8,940 items of WTEE to be recycled; ■ Bays containing bagged PUR are each 10 m x 12 m x 3.6 m in size and have the capacity to hold up to 240 bags of 800 kg of PUR (totalling 192 tonnes); ■ Metal fragments will be stored in a bay up to a capacity of 200 tonnes; ■ Rest ferrous and non-ferrous bays can hold approximately 100 stillages, non-stacked, each. <p>External storage bay capacity is broken down into the following bay capacities:</p> <ul style="list-style-type: none"> ■ Pre-treated SMW is to be stored in bays of dimensions: 16 m x 8 m x 3.6 m and 8.4 m x 4.5 m x 3.6 m. ■ Sorted SMW will be stored in bays of sizes: 10 m x 9 m x 3.6 m and 15 m x 9 m x 3.6 m, 	

5.4.2. DUST, MUD, LITTER AND PESTS

Airborne dust particles have the potential to be emitted from the recycling processes, as well as the loading processes. Enclosure of the process within a building and design of the process equipment has taken into account the requirement to contain these airborne particles and prevent them from being released. Suitable abatement measures will be installed at the point source emissions, to prevent fugitive emission release. During high temperature and dry weather conditions, there is an increased likelihood of particulate release, therefore, additional measures may need to be taken, following a daily assessment of the conditions (to be recorded in the site diary).

Regarding pest infestations, there should be very little materials / food kept on site that would be likely to attract pests. The process will be totally covered and enclosed within a building and any rodent or insect infestation will be managed by means of a site pest control contractor. A sustainable approach to pest management will involve establishing a partnership with an external pest control

contractor, to ensure that their expertise in biological, cultural, physical and chemical tools is utilised, whilst minimising economic, health and environmental risks, simultaneously controlling any pest issues that may arise at the facility.

Installations are required to use appropriate measures to prevent emissions of dust and particulates, including mud, dust, litter and pests. The table below (Table 5-17) outlines the appropriate measures that should be implemented, from the GOV.UK²⁰ website, alongside how the proposed operational arrangements at the Dartford WEEE facility will meet these requirements.

Table 5-17 - Guidance on Fugitive Emissions to Air from Appropriate Measures for WEEE Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Appropriate measures to prevent emissions of dust, mud and litter should be used.</p>	<p>Dust will be controlled through the measures detailed within the fugitive emissions management plan, in Appendix G.</p> <p>The majority of the site is hardstanding and all vehicles accessing site have been on major road network so mud should not be generated or tracked onto site.</p> <p>There is very little in the way of welfare waste which is controlled in enclosed bins to prevent any release of litter.</p>	<p>Yes</p>
<p>Storage and treatment plants should be designed, operated and maintained in a way that prevents fugitive emissions to air, including dust and organic compounds. Where that is not possible, emissions must be minimised. This includes associated equipment and infrastructure, such as:</p> <ul style="list-style-type: none"> ■ Shredders; ■ Sorting equipment; ■ Conveyors; ■ Skips or containers; ■ Building fabric, including doors and windows; and ■ Pipework and ducting. 	<p>All process equipment from the deconstruction activities is to be contained within buildings with the emission points being appropriately abated.</p>	<p>Yes</p>
<p>Fugitive emissions must be collected and directed to appropriate abatement and the treatment plant must use high integrity components (e.g. seals or gaskets).</p>	<p>As detailed in Point source emissions to air, Section 5.2, all emissions points are appropriately abated.</p>	<p>Yes</p>

²⁰ [Waste electrical and electronic equipment \(WEEE\): appropriate measures for permitted facilities - 6. Emissions control appropriate measures - Guidance - GOV.UK.](#)

Requirements	Proposed Arrangements	Appropriate Measure?
<p>Waste pre-acceptance, waste acceptance and site inspection checks and procedures must be used to identify and manage wastes that could cause, or are causing, fugitive emissions to air. When any of these wastes are identified:</p> <ul style="list-style-type: none"> ▪ Appropriate, risk-assessed measures must be taken to prevent and control emissions; and ▪ Treatment or transfer must be prioritised. 	<p>The waste that will be received at site will include WTEE (consisting of fridges and freezers) and SMW (including display screen equipment) which should not become airborne or have emissions to air when received at site.</p>	<p>Yes</p>
<p>Where necessary, to prevent fugitive emissions to air from the storage and handling of dusty wastes, a combination of the following measures should be used:</p> <ul style="list-style-type: none"> ▪ Store and handle such wastes within a building or enclosed equipment; ▪ Keep buildings and equipment under adequate negative pressure with an appropriate abated air circulation or extraction system; ▪ Where possible, locate air extraction points close to potential emission sources; ▪ Use fully enclosed material transfer and storage systems and equipment (e.g. conveyors, hoppers, containers, tanks and skips); ▪ Keep building doors and windows shut to provide containment, other than when access is required for loading or unloading; ▪ Minimise drop height; and ▪ Use misting systems and wind barriers. 	<p>Roadways may be dampened with water to increase the moisture levels and reduce dust emissions release risk during dry periods should there be any visible build-up of dirt.</p> <p>The waste being deconstructed and the process of deconstruction will be in an enclosed building.</p> <p>Doors to be closed to prevent dust escaping during periods of high wind.</p>	
<p>Develop and implement a dust management plan, where required, following guidance²¹.</p>	<p>A fugitive emissions management plan has been developed. See Appendix G.</p>	<p>Yes</p>
<p>A leak detection and repair programme must be set up, to promptly identify and mitigate any future fugitive emissions from the treatment plant and associated infrastructure.</p>	<p>All equipment will be included in the site preventative maintenance programme.</p>	<p>Yes</p>

²¹ <https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#emissions-management-plan-for-dust>.

Requirements	Proposed Arrangements	Appropriate Measure?
<p>All waste storage and treatment areas, equipment and containers must be regularly inspected and cleaned, containing any residues collected during cleaning.</p>	<p>Site entrances and on-site hardstanding areas shall be regularly inspected and swept / cleaned whenever any significant build-up of particulate dust is detected.</p> <p>An external road sweeper contractor will also be invested in to complete a monthly sweep and clean of all site roads and rear yard.</p>	<p>Yes</p>
<p>Maintenance and cleaning schedules must make sure that the plant is regularly cleaned to avoid large-scale decontamination activities.</p>	<p>Site entrances and on-site hardstanding areas shall be regularly inspected and swept / cleaned whenever any significant build-up of particulate dust is detected.</p> <p>An external road sweeper contractor will also be invested in to complete a monthly sweep and clean of all site roads and rear yard.</p> <p>All equipment will be subject to appropriate cleaning and schedule and maintenance programme.</p>	<p>Yes</p>
<p>Measures must be taken to prevent corrosion of plant and equipment, including:</p> <ul style="list-style-type: none"> ■ Selecting and using appropriate construction materials; ■ Lining or coating equipment with corrosion inhibitors; and ■ Regularly inspecting and maintaining plant. 	<p>Equipment used in the recycling processes will be painted by the manufacturer, to promote longevity in the kit and prevent corrosion from occurring. There will be regular inspections of the equipment undertaken in accordance with the preventative maintenance programme, to identify any areas of corrosion, to allow maintenance to be carried out to rectify any issues.</p>	<p>Yes</p>
<p>There must be an appropriate regular maintenance programme covering all buildings, plant and equipment.</p>	<p>Regular maintenance checks will be carried out at the facility on all equipment in accordance with the manufacturers recommendations to ensure good working order and prevent any further issues arising.</p>	<p>Yes</p>

The proposed arrangements for reducing fugitive emissions to air are linked to the relevant BAT conclusions from the Waste Treatment BREF, below (Table 5-18).

Table 5-18 - BAT Requirements for Fugitive Emissions to Air from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangements	BAT?
<p>BAT 14: In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques given below.</p> <ul style="list-style-type: none"> ▪ Minimising the number of potential diffuse emission sources ▪ Selection and use of high-integrity equipment ▪ Corrosion prevention ▪ Containment, collection and treatment of diffuse emissions ▪ Dampening ▪ Maintenance ▪ Cleaning of waste treatment and storage areas ▪ Leak detection and repair (LDAR) programme 	<p>The principal measure to control fugitive emissions in place at site is having the two deconstruction processes enclosed within a building with the emissions points from each process via abated emission points with appropriate abatement.</p> <p>All equipment will be new and will be subject to a preventative maintenance programme to limit the potential for corrosion and breakdowns.</p>	<p>Yes</p>

5.5. ODOUR

Odour is not expected to be an issue at receptors, given that the nature of the waste being received is non-odorous and not organic or biodegradable, the process activities take place in an enclosed building, and the nearest sensitive receptors are at a distance from the site.

All of the treatment activities for the WEEE with the deconstruction processes will be carried out internal to buildings and so the risk of odour reaching receptors is low.

Outlined below are the relevant appropriate measures for odour for WEEE permitted facilities and how the Dartford facility is proposing to meet such measures.

Table 5-19 - Guidance on Odour from WEEE Appropriate Measures for Permitted Facilities

Requirements	Proposed Arrangements	Appropriate Measure?
<p>The amount of time odorous wastes spend in storage and handling systems on site should be minimised by procedures in place, particularly via provisions to manage waste during periods of peak volume.</p>	<p>Waste pre-acceptance and acceptance procedures are enforced and waste will only be accepted when there is sufficient treatment capacity within the facility. This will prevent a build-up of waste to be recycled.</p>	<p>Yes</p>
<p>Measures to contain, collect and treat odorous emissions should be implemented, including enclosed buildings and plant or equipment with appropriate air extraction and abatement.</p>	<p>All incoming waste will arrive within enclosed lorries, will be offloaded and inspected, with doors on any products (such as fridges) kept closed to prevent the escape of any potential odour. WTEE will be transferred into the main building for storage and SMW will be unloaded into the external bunkers.</p> <p>In the event that appliances arriving at the facility are not in a clean condition, they will be cleaned immediately so as to reduce odour nuisance, with any food waste or odorous waste removed and placed in sealed bags and appropriately disposed of.</p>	<p>Yes</p>
<p>Monitoring and maintenance of odour abatement systems should be carried out to ensure optimum performance (e.g. ensuring scrubber liquors are maintained at the correct pH and replenished or replaced at an appropriate frequency).</p>	<p>Routine olfactory monitoring (sniff testing) will be undertaken daily, by the same individual as far as possible, in order to assess whether any odours are detectable at the installation boundary. The sniff test will consist of the assessor standing at the designated monitoring position for a specific period of time and recording (in the Site Diary) any odour (frequency, intensity, duration and offensiveness, as well as prevailing meteorological conditions) experienced at the survey location during this time, repeating at other monitoring points across the site. Analysis of results will be conducted in associated with operating conditions during the survey, in order to consider the most significant odour sources and how these may be affecting sensitive receptors.</p> <p>If the results suggest that odour is, or is likely to be, caused beyond the site's boundary, further olfactory monitoring will be undertaken.</p>	<p>Yes</p>
<p>Contaminated waters should be stored in containers or enclosed tanks that are vented to an abatement system, as they have the potential for odours.</p>	<p>There will be no waters received with the waste. Additionally, the process is a dry process and therefore will not be generating any contaminated waters.</p>	<p>N/A</p>
<p>Where odour pollution is expected at sensitive receptors (or has been substantiated), periodic monitoring of</p>	<p>Odour is not expected to be an issue at receptors given the nature of the waste being received is non-odorous and not organic or biodegradable, the process activities take place</p>	<p>N/A</p>

Requirements	Proposed Arrangements	Appropriate Measure?
<p>odour emissions should be carried out using EN standards, using either:</p> <ul style="list-style-type: none"> ▪ Dynamic olfactometry according to EN 13725 to determine the odour concentration ▪ EN 16841-1 or -2 to determine odour exposure 	<p>in an enclosed building, and the nearest sensitive receptors are at a distance from the site.</p> <p>Odour risk is demonstrated to be low risk in the Environmental Risk Assessment (Appendix E).</p>	
<p>For methods used that do not have EN standards available, ISO, national or other international standards should be used, to ensure data is used of an equivalent scientific quality. The monitoring frequency should be set out in the odour management plan.</p>	<p>No monitoring required due to the risk from odour being considered to not pose a risk at the relevant receptors.</p>	N/A
<p>Where odour pollution is expected at sensitive receptors (or has been substantiated), implementation and regular review of an odour management plan should be conducted. It should be part of the management system, covering all of the following aspects:</p> <ul style="list-style-type: none"> ▪ Actions and timelines to address any issues identified ▪ Procedures for conducting odour monitoring ▪ Procedures for responding to identified odour incidents ▪ Odour prevention and reduction programme designed to identify the sources, characterise contributions and implement prevention and reduction measures. 	<p>Odour is not expected to be an issue at receptors given the nature of the waste being received is non-odorous and not organic or biodegradable, the process activities take place in an enclosed building, and the nearest sensitive receptors are at a distance from the site.</p> <p>Odour risk is demonstrated to be low risk in the Environmental Risk Assessment (Appendix E).</p>	N/A
<p>Development and implementation of odour management plans, where required, in line with EA guidance on odour management plans²².</p>	<p>Odour is not expected to be an issue at receptors given the nature of the waste being received is non-odorous and not organic or biodegradable, the process activities take place in an enclosed building, and the nearest sensitive receptors are at a distance from the site.</p> <p>Odour risk is demonstrated to be low risk in the Environmental Risk Assessment (Appendix E).</p>	N/A

²² <https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#odour-management-plan>.

Monitoring of odorous emissions and the proposed arrangements alongside the requirements from the relevant BAT document relating to Waste Treatment are presented in Table 5-20 below.

Table 5-20 - BAT Requirements for Odour Emissions and Monitoring from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangements	BAT?
<p>BAT 10: BAT is to periodically monitor odour emissions.</p> <p>Odour emissions can be monitored using:</p> <ul style="list-style-type: none"> ■ EN standards (e.g. dynamic olfactometry according to EN 13725 in order to determine the odour concentration or EN 16841-1 or -2 in order to determine the odour exposure); ■ when applying alternative methods for which no EN standards are available (e.g. estimation of odour impact), ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. The monitoring frequency is determined in the odour management plan (see BAT 12) <p>The applicability is restricted to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.</p>	<p>Odour is not expected to be an issue at receptors given the nature of the waste being received is non-odorous and not organic or biodegradable, the process activities take place in an enclosed building, and the nearest sensitive receptors are at a distance from the site.</p> <p>Odour risk is demonstrated to be low risk in the Environmental Risk Assessment (Appendix E).</p> <p>Furthermore, the site is not yet constructed and no substantiated nuisance from odour is expected or has occurred.</p>	<p>N/A</p>
<p>BAT 12: In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:</p> <ul style="list-style-type: none"> ■ a protocol containing actions and timelines; ■ a protocol for conducting odour monitoring as set out in BAT 10; ■ a protocol for response to identified odour incidents, e.g. complaints; ■ an odour prevention and reduction programme designed to identify the source(s); to characterise the contributions of the sources; and to implement prevention and/or reduction measures. <p>The applicability is restricted to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.</p>	<p>See response to BAT 10 above.</p>	<p>N/A</p>

BREF Requirements	Proposed Arrangements	BAT?
<p>BAT 13: In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques given below:</p> <ul style="list-style-type: none"> ■ Minimising residence times; ■ Using chemical treatment; and ■ Optimising aerobic treatment. 	<p>Odour is not expected to be an issue at receptors given the nature of the waste being received is non-odorous and not organic or biodegradable, the process activities take place in an enclosed building and the nearest sensitive receptors are at a distance from the site.</p> <p>Odour risk is demonstrated to be low risk in the Environmental Risk Assessment (Appendix E).</p>	<p>N/A</p>

In conclusion, odour is not expected to be an issue at receptors given the nature of the waste being received is non-odorous and not organic or biodegradable, the process activities take place in an enclosed building and the nearest sensitive receptors are at a distance from the site. This has been demonstrated with the Environmental Risk Assessment.

5.6. NOISE

A number of the activities to be undertaken at this proposed site have the potential to generate noise emissions. Expected sources of noise and vibration generated at the proposed site have been identified from the following activities:

- Transportation of the products on and off-site by road, including the loading and unloading of containers and external sub-contractor vehicles;
- Mechanical and manual handling and separation, deconstruction of Cathode Ray Tubes (CRT) televisions, refinement and harvesting of parts and also external out loading of component parts.
- On site vehicle movements around the facility from the mobile plant and waste transportation vehicles;
- The treatment of SMW throughout the process flow, particularly from the shredding process;
- The treatment of WTEE throughout the process flow, particularly from the QZ; and
- Vibration through the use of hand-held tools.

These sources of noise and vibration are not all continuous and, therefore, the sources will vary throughout the day.

Noise and vibration risk is considered as part of the Environmental Risk Assessment (Appendix E). Noise is not expected to be an issue at receptors given that the process activities take place in an enclosed building and the nearest sensitive receptors are at a distance from the site as well as the site having a 4m acoustic barrier on the south-east boundary of the yard, to the south of the site entrance, which continues on the south-west boundary to meet the unit building. This is detailed in the plan shown below in Figure 5-1. All of these considerations mean that noise was screened as being insignificant and not requiring further assessment in the Environmental Risk Assessment.

Figure 5-1 - Site Plan Highlighting Proposed Acoustic Barrier



To support the conclusion that a Noise Impact Assessment (NIA) and a Noise Management Plan (NMP) are not to be required to support this project, the EA’s Noise Advisory Tool (NAT) has been employed to help understand the noise-related impacts on nearby receptors, in the context of the site activities and mitigating measures that will be in place. The results of the NAT concluded that there is no requirement for an NIA or an NMP to be developed for the site. Justification for this is provided through the containment measures that will be implemented, as well as the location of the nearest receptors in relation to the site and other noise sources. The nearest receptors are also in close proximity to other noise sources, such as a busy main road, as well as other industrial sites in between, which will therefore reduce the impact of any noise generation at Enva’s Dartford facility on such receptors.



Figure 5-2 - Screenshot of the NAT used to screen out requirement for NIA and NMP.

Step 1: To be completed for all applications

input details of the site AFTER the variation is complete

	Select from the drop-down lists	Evidence your decision here
1. Activity Type	Waste recycling transfer/treatment/processing	WEEE recycling facility
2. Activity Containment	Internal operations with external deliveries, goods handling and storage, no processing	All recycling operations will be contained within the main building. External areas will be used for storage only. The site will also be surrounded by a 4m high acoustic fence, to prevent noise nuisance. Therefore, noise will be suitably contained.
3. Operation at night	No	Operations will be carried out in shifts, with no overnight shifts planned. There may be vehicle movement at the facility overnight, however this will remain at a minimum. Mobile plant on site will use white noise reversing alarms. Further justification provided in the supporting report.
4. Operation Size	medium	The recycling capacity at the site comprises 35,000 tonnes per annum of WTEE and 40,000 tonnes per annum of SMW.
5. Input distance from site to the nearest (or proposed) noise sensitive receptor (m)	201-300	The nearest noise receptor is Travelodge Dartford Crossing, which is 260 m to the west of the site. The nearest residential noise receptor is Liberty Court, which is 380 m to the south.
6. Residential receptor Location	suburban	Liberty Court is a residential receptor surrounded by a combination of other residential receptors and more open areas. Travelodge Dartford Crossing is in an industrial location.
7. Residential receptor proximity to other major noise source (m) e.g. busy road, other industrial activities, etc.	<100	This residential receptor (Liberty Court) is in close proximity to a busy main road, which is anticipated to be a noise source.

The result will automatically update when the values are selected from the drop down menus

Evaluation	NIA and NMP are not required*
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*The Environment Agency reserves the right to request the submission of an NIA or NMP independent of the outcome of noise advisory tool

Furthermore, a noise assessment undertaken by another third-party company has predicted noise levels at the nearest receptors due to the effects of operating the proposed plant.. This has demonstrated that the predicted noise levels are at least 5 dB (-6 dB to -44 dB) below the night-time background noise levels at the nearest receptors which is considered to be a low impact in accordance with BS4142: 2014. This therefore provides further justification for a separate noise impact assessment not being required specifically to support the environmental permit variation application.

In conclusion, there will be no adverse noise effects due to the changes to operational activities to be carried out onsite.

Table 5-21 details the guidance on emissions to noise and vibrations for permitted WEEE facilities, and how measures will compare and be implemented at this proposed development.

Table 5-21 - Guidance on Emissions of Noise and Vibration from Appropriate Measures for WEEE Permitted Facilities.

Requirements	Proposed Arrangements	Appropriate Measures?
<p>The layout of the facility should be designed to locate potential sources of noise (including building exits and entrances) away from sensitive receptors and boundaries, locating buildings walls and embankments so they act as noise screens.</p>	<p>The site will have a 4m acoustic barrier on the south-east boundary of the yard, to the south of the site entrance, which continues on the south-west boundary to meet the unit building which itself would act as an acoustic barrier.</p>	<p>Yes</p>
<p>Appropriate measures must be used to control noise, including:</p> <ul style="list-style-type: none"> ■ Adequately maintaining plant or equipment parts that may become noisier as they deteriorate; ■ Closing doors or windows of enclosed areas or buildings; ■ Avoiding noisy activities at night or early in the morning; ■ Minimising drop heights and the movement of waste containers; ■ Using broadband (white noise) reversing alarms and enforcing the on-site speed limit; ■ Using low-noise equipment ■ Adequately training and supervising staff; and ■ Where possible, providing additional noise and vibration control equipment for specific noise sources. 	<p>Noise and vibration emissions will be reduced by ensuring that machinery is adequately maintained in accordance with the manufacturers' recommendations.</p> <p>Where noise and vibration emissions cannot be designed out or reduced by effective maintenance then insulation, absorption, or isolation will be used as far as practicable for reducing noise and vibration emissions.</p> <p>Site staff will have an awareness to avoid all unnecessary noise and vibration, such as due to misuse of tools / equipment. Further enhancing this, staff will be trained to operate the plant and equipment without causing excess noise and vibration.</p> <p>White noise reversing alarms will be used on mobile plant.</p> <p>Exhausts to the atmosphere will be of low flow and are therefore not anticipated to generate high noise levels and are not likely to require silencers to be installed.</p>	<p>Yes</p>

Requirements	Proposed Arrangements	Appropriate Measures?
<p>Where noise or vibration pollution at sensitive receptors is expected or has been substantiated, a noise and vibration management plan must be created, used and regularly reviewed. This must be part of the EMS and must include:</p> <ul style="list-style-type: none"> ■ Actions and timelines to address any issues identified; ■ A procedure for conducting noise and vibration monitoring; and ■ A procedure for responding to identified noise and vibration events. 	<p>A daily safety and environmental audit form will be in place for recording complaints, to be completed by the facility manager and reported to the Enva Customer Services team (who will then follow the internal complaints procedure).</p>	
<p>The noise and vibration management plan should also include a noise and vibration reduction programme designed to:</p> <ul style="list-style-type: none"> ■ Identify the sources of noise and vibration; ■ Measure of estimate noise vibration and exposure; ■ Characterise the contributions of the sources; and ■ Implement prevention and reduction measures. 	<p>Noise and vibration management plan is not required as the site is considered to be very low risk with regards to noise as detailed within the Environmental Risk Assessment.</p>	N/A
<p>Where a noise and vibration management plan is required, it must be developed and implemented following EA guidance on noise and vibration management plans²³.</p>	<p>Noise and vibration management plan is not required as the site is considered to be very low risk with regards to noise as detailed within the Environmental Risk Assessment.</p>	N/A

Table 5-22 details the guidance on emissions to noise and vibrations for permitted WEEE facilities, and how measures will compare and be implemented at this proposed development.

²³ <https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#noise-and-vibration-management-plan>.

Table 5-22 - BAT Requirements for Noise and Vibrations from Waste Treatment BREF (August 2018)

BREF Requirements	Proposed Arrangements	BAT?
<p>BAT 17: In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:</p> <ul style="list-style-type: none"> ■ a protocol containing appropriate actions and timelines; ■ a protocol for conducting noise and vibration monitoring; ■ a protocol for response to identified noise and vibration events, e.g. complaints; ■ a noise and vibration reduction programme designed to identify the source(s), to measure/estimate noise and vibration exposure, to characterise the contributions of the sources and to implement prevention and/or reduction measures. <p>The applicability is restricted to cases where a noise or vibration nuisance at sensitive receptors is expected and/or has been substantiated.</p>	<p>Noise and vibration management plan is not required as the site is considered to be very low risk with regards to noise as detailed within the Environmental Risk Assessment.</p> <p>The site is not built yet and would have no substantiated complaints.</p>	<p>N/A</p>
<p>BAT 18: In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given below:</p> <ul style="list-style-type: none"> ■ Appropriate location of equipment and buildings; ■ Operational measures; ■ Low-noise equipment; ■ Noise and vibration control equipment; and ■ Noise attenuation. 	<p>The site through its design uses the buildings as a natural acoustic barrier and has a 4m acoustic fence surrounding the sides where the nearest noise sensitive receptors are.</p> <p>Furthermore, the processes are located within a building.</p>	<p>Yes</p>

In conclusion, noise is not expected to be an issue at receptors given the site through its design uses the buildings as a natural acoustic barrier and has a 4m acoustic fence surrounding the sides where the nearest noise sensitive receptors are. Furthermore, the processes are located within a building. This has been demonstrated with the Environmental Risk Assessment.

6. ENVIRONMENTAL RISK ASSESSMENT-IMPACTS

An assessment of the environmental risks posed by the proposed development has been undertaken. In accordance with the EA's requirements for risk assessments (from GOV.UK guidance), the development has been assessed with regards to its potential to generate significant environmental consequences. Appendix E comprises a copy of the environmental risk assessment, which:

- Identifies and considers risks of the site and the sources of the risks;
- Identifies the receptors at risk from the site;
- Identifies the possible pathways from the sources of the risks to the receptors;
- Identifies appropriate risk management techniques to control the risks, as necessary; and
- Assesses the overall risks to determine if they can be screened out as significant.

Based on the risk assessment provided in Appendix E, it can be seen that risks associated with the development of the site are deemed to be acceptable when considered in line with the intended management techniques.

The guidance also specifies that there are additional risk assessment requirements depending on:

- The activity the bespoke permit relates to; and
- Where substances are released or discharged into the environment.

6.1. EMISSIONS TO WATER

Due to the nature of the planned emissions to water, a H1 Risk Assessment has not been conducted as the emissions will only consist of surface water run-off. Provisions will be in place across the facility to ensure that suitable storage of potential contaminants is maintained, to prevent contamination of the surface water run-off, but there will also be an oil interceptor installed prior to collection of the run-off in an attenuation tank. Therefore, any pollutants will be removed prior to entering the attenuation tank. There is also a penstock valve planned to be fitted to the holding tank, which therefore allows the sampling of water in the tank, prior to release for discharge.

6.2. EMISSIONS TO AIR

The emissions associated with the operation of the WEEE recycling facility were input into the EA H1 Software tool to assess the potential impact from the facility. As discussed in sections above, there are 3 stack emission points namely A1, A2 and A3. The key characteristics of these stacks are also presented in the table in Figure 6-1 below.

Figure 6-1 - Emission Release Points and Key Characteristics

Release point code	Location or grid reference	Activity/Activities	Effective height (metres)	Dispersion factor (Long term)	Dispersion factor (short term)	Dispersion factor (monthly)	Efflux velocity (m/s)	Total flow (m3/h)
A1	TQ.57275 75464	WEEE Line - central dedusting system SDA P	0	148	3900	529	11.1	40
A2	TQ.57275 75464	CARRIE - blowing agent recovery system	0	148	3900	529	0.055	200
A3	TQ.57275 75464	Fridge Line - exhaust pipe ATN stage 1	0	148	3900	529	0.0028	10

The concentration of release was based on the emission limit for each substance likely to have a permitted limit with the key parameters de-tailed in the table in Figure 6-2 below.

Figure 6-2 - Emissions Data by Emission Point and Substance

Release Point	Substance	Measurement method	Operating mode[%]	Long term conc (mg/m3)	Release rate g/s (long term)	Measurement basis (Long term)	Short term conc (mg/m3)	Release rate g/s (short term)	Measurement basis (short term)	Annual rate (t/yr)	Long term PC (ug/m3)	Short term PC (ug/m3)	Total Flow (m3/h)
A1	Particulates (PM10)	Estimated	72% 72% 72%	5 15 5	0.00 0.00 0.00	5 15 5	5 15 5	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.01 0.03	0.01 0.02 0.04	0.13 0.38 1.92	40.00 40.00 200.00
A2	Particulates (PM10)	Estimated	72% 72% 72%	5 15 5	0.00 0.00 0.00	5 15 5	5 15 5	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.02 0.09	0.00 0.00 0.00	0.03 0.09 0.03	200.00 200.00 10.00
A3	Particulates (PM10)	Estimated	72% 72% 72%	5 15 5	0.00 0.00 0.00	5 15 5	5 15 5	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.10	0.00 0.00 0.00	10.00 10.00 10.00

Taking the above data the H1 calculates the combined process contribution for each substance as can be seen in table in the table in Figure 6-3 below.

Figure 6-3 - Combined Long and Short-term Contribution for Each Pollutant

Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	Long term modelled PC	Short term EAL (ug/m3)	Short term PC (ug/m3)	Short term modelled PC
1	Particulates (PM10)	40	0.037	50	50	0.798958333	
2	Benzene	5	0.111	30	30	2.396875	

Using the data above the environmental assessment test 1 results can be seen in the table in Figure 6-4 below.

Figure 6-4 - Environmental Assessment Test 1 results

Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	%PC of EAL (long term)	>1% of EAL? (long term)	Short term EAL (ug/m3)	Short term PC (ug/m3)	%PC of EAL (short term)	>10% of EAL? (short term)
1	Particulates (PM10)	40	0.037	0.09%	pass	50	0.798958333	1.60%	pass
2	Benzene	5	0.111	2.22%	fail	30	2.396875	7.99%	pass

Figure 6-4 shows that benzene fails the long-term criteria of >1% of the EAL. This substance then goes on to Test 2 which includes background data. The results for Test 2 can be seen in the table in Figure 6-5 below.

Figure 6-5 - Environmental Assessment Test 2 results

Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	Air Background conc (ug/m3)	PEC Long term (ug/m3)	%PC of EAL (Long)	%PC of EAL >70%?	Short term EAL (ug/m3)	Short term PC (ug/m3)	%PC of the EAL - 2x background	PEC Short term (ug/m3)	%PC of EAL - background
2	Benzene	5	0.111	0.65	0.76	15.22%	pass	30	2.396875	8.32%	pass	pass

Figure 6-5 above shows that benzene passes both long- and short-term criteria at Test 2 and therefore is not considered to require any further assessment.