



Environment
Agency



Waste electrical and electronic equipment (WEEE): appropriate measures for permitted facilities

Consultation

Date: July 2021

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We help people and wildlife adapt to climate change and reduce its impacts, including flooding, drought, sea level rise and coastal erosion.

We improve the quality of our water, land and air by tackling pollution. We work with businesses to help them comply with environmental regulations. A healthy and diverse environment enhances people's lives and contributes to economic growth.

We can't do this alone. We work as part of the Defra group (Department for Environment, Food & Rural Affairs), with the rest of government, local councils, businesses, civil society groups and local communities to create a better place for people and wildlife.

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1. Introduction

This guidance explains the standards (appropriate measures) that are relevant to regulated facilities with an environmental permit to treat or transfer all types of waste electrical and electronic equipment (WEEE).

It also applies to sites that treat or transfer materials derived from the processing of WEEE that require further treatment to comply with the WEEE Directive. For example, the sorting and segregation of WEEE plastic containing brominated flame retardants.

There's extra guidance on the appropriate measures for facilities that treat or transfer waste cooling equipment (WCE). If your facility is permitted to treat or transfer WCE then you must comply with both this guidance and the WCE guidance.

There's [separate guidance for sites that store or treat other kinds of waste](#). If WEEE is stored or treated at a site covered by other guidance, you must follow the relevant parts of this guidance that apply to your WEEE activities.

If you operate under an exemption that allows the treatment or storage of WEEE you should also follow the relevant parts of this guidance.

The treatment standards in this guidance are primarily focused on recycling operations rather than preparing WEEE for reuse.

If you prepare WEEE for reuse you must follow the guidance on:

- [general management](#)
- [waste pre-acceptance, acceptance and tracking](#)
- [waste storage, segregation and handling](#)

And relevant parts of the guidance in:

- [waste treatment](#)
- [emissions control](#)
- [emissions monitoring and limits](#)
- [process efficiency](#)

1.1 When appropriate measures apply

There is a lot of overlap between:

- best available techniques (BAT) for waste installations facilities

- necessary measures for waste operation facilities
- best available treatment recovery and recycling techniques (BATRRRT) for the treatment of WEEE
- ‘proper treatment’ as referred to by the WEEE Directive

The Environment Agency uses the term ‘appropriate measures’ to cover all these requirements. Appropriate measures are the standards that operators should meet to comply with their environmental permit requirements. This guidance sets out what you must consider when you assess the appropriate measures for your site. It is not definitive and it does not replace your obligation to assess appropriate measures fully taking into account your site’s location and characteristics.

Where measures are specified for certain types of WEEE, those measures are in addition to any applicable measures set out in the [general waste treatment](#) section.

Some measures may not be suitable or relevant for your operation. Appropriate measures will depend on the:

- activities being carried out
- size and nature of the activities
- location of the site

For installations there are additional requirements for using energy and raw materials (including water) efficiently. These are called process efficiency measures.

Where a measure is not suitable, an operator can propose alternative measures that achieve the same level of environmental protection. Or they can provide an explanation of why the specific measure is not relevant.

In certain situations, you may need to provide a higher standard of environmental protection, for example:

- where there are local sensitive receptors
- if there is a risk that an operator may exceed an Environmental Quality Standard

This guidance also covers some activities where legislation applies directly to that activity. This guidance and any time scales for the appropriate measures does not remove the need to comply with that legislation. For example, legislation relating to [F-gases](#), [persistent organic pollutants \(POPs\)](#), or [hazardous waste](#).

1.2 Measures that apply to different types of facilities

The standards in this technical guidance have been grouped into:

- general management
- waste pre-acceptance, acceptance and tracking
- waste storage, segregation and handling
- waste treatment
- emissions control
- emissions monitoring and limits
- process efficiency (measures for using energy, raw materials and water apply to Industrial Emissions Directive (IED) installations only – other measures including process monitoring apply to all permitted facilities)

Other generic technical guidance also applies to metal shredding facilities, including [guidance on emissions, odour and noise](#).

You also need an approved fire prevention plan that meets the requirements of our [guidance on fire prevention plans](#).

Medium combustion plant with a rated thermal input between 1 megawatt and 50 megawatts must comply with the relevant requirements of the Medium Combustion Plant Directive. Specified generator controls, unless excluded, apply to generators with a rated thermal input of up to 50 megawatts. See our [guidance on medium combustion plant and specified generators](#).

1.3 Implementing appropriate measures at new and existing facilities

The appropriate measures in this guidance apply to both new and existing facilities that treat or transfer WEEE.

For new facilities the appropriate measures must be in place before operations start.

For existing facilities, if the cost of complying with the appropriate measures is disproportionate to the environmental benefit, immediate compliance may not be reasonable.

Through permit reviews, the Environment Agency will assess the current operating techniques of existing facilities against the relevant appropriate measures.

Where an operator is not using appropriate measures, we will expect them to provide improvement plans and timetables for implementing the relevant appropriate measures. We will review these proposals and set formal timescales for making the improvements

needed. We will do this by varying the environmental permit to include improvement conditions.

Improvements at existing facilities are likely to fall into one of the following 2 categories.

Standard good practice requirements

For example, these could be:

- updated management systems
- waste, water and energy efficiency measures
- measures to prevent fugitive or accidental emissions
- waste acceptance and handling techniques
- appropriate monitoring equipment

Where these improvements are relatively low cost, operators must implement them as soon as possible and in any event within 12 months.

Larger, more capital intensive improvements

For example, these could be:

- installing significant abatement equipment
- the significant redesign of facility layout, including the design and installation of new buildings or treatment plant

Operators should complete these improvements as soon as practicable and within 3 years.

Local environmental impacts may mean you need to act more quickly than the timescales provided here. For example, if there are sensitive receptors or an air quality management area close by.

Existing installations must comply with relevant BAT associated emission levels (AELs) by August 2022, unless we approve a [derogation](#). BAT AELs are set out in the published [waste treatment BAT conclusions](#).

New installations (including new or replacement plant at existing facilities or a [substantial change](#) to existing plant) must comply with any relevant BAT AELs from when operations begin, unless a derogation is approved.

2. General management appropriate measures

These are the appropriate measures for the general management of a regulated facility with an environmental permit for the treatment or transfer of WEEE.

2.1 Management system

1. You must have and follow an up-to-date written management system. It must incorporate the following features.

You have:

- 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

You plan and establish the resources, procedures, objectives and targets needed for environmental performance alongside your financial planning and investment.

You implement your environmental performance procedures, paying particular attention to:

- staff structure and relevant responsibilities
- staff recruitment, training, awareness and competence
- communication (for example, of performance measures and targets)
- employee involvement
- documentation
- effective process control
- maintenance programmes
- the management of change (including legislative changes and waste classification changes)
- emergency preparedness and response
- making sure you comply with environmental legislation

You check environmental performance and take corrective action paying particular attention to:

- 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 to confirm it has been properly implemented and maintained

Senior managers review the management system to check it is still suitable, adequate and effective.

You review the development of cleaner technologies and their applicability to site operations.

When designing new plant, you make sure that you assess the environmental impacts from the plant's operating life and eventual decommissioning.

You consider the risks a [changing climate](#) poses to your operations. You have appropriate plans in place to assess and manage future risks.

You compare your site's performance against relevant sector guidance and standards on a regular basis, known as sectoral benchmarking.

You have and maintain the following documentation:

- inventory of emissions to air and water
- residues management plan
- accident management plan
- [site infrastructure plan](#)
- [site condition report](#)
- [fire prevention plan](#)

If required, you have and maintain the following documentation:

- odour management plan
- noise and vibration management plan
- dust management plan
- pest management plan
- [climate change risk assessment](#)

2.2 Staff competence

1. Your site must be operated at all times by an adequate number of staff with appropriate qualifications and competence.
2. The design, installation and maintenance of infrastructure, plant and equipment must be carried out by competent people.
3. You must have appropriately qualified managers for your waste activity who are either:
 - qualified under a technical competence scheme
 - operating under a Competence Management System approved under a technical competence scheme
4. 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.

2.3 Accident management plan

1. As part of your management system you must have a plan for dealing with any incidents or accidents that could result in pollution.
2. The accident management plan must identify and assess the risks the facility poses to human health and the environment.
3. Areas to consider may include:
 - 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

4. You must assess the risk of accidents and their possible consequences. 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?
- 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 do to prevent or reduce the risk?

5. In particular, you must identify any fire risks 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

You must have a fire prevention plan that identifies the risks at your site and meets the requirements of our [fire prevention plan guidance](#).

6. The depth and type of accident risk assessment you carry 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

7. Through your accident management plan, you must also identify the roles and responsibilities of the staff involved in managing accidents. You must provide them with clear guidance on how to manage each accident scenario, for example, whether to use containment or dispersion to extinguish fires, or let them burn.

8. You must appoint one facility employee as an emergency co-ordinator who will take lead responsibility for implementing the plan. You must train your employees so they can perform their duties effectively and safely and know how to respond to an emergency.

9. You must also:

- establish how you will communicate 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 at least annually by carrying out emergency drills and exercises

2.4 Accident prevention measures

1. You must take the following measures, where appropriate, to prevent events that may lead to an accident.

Segregating waste

2. You must keep apart incompatible wastes.

Preventing accidental emissions

3. You must make sure you contain the following for off-site disposal or route to the effluent system as appropriate:

- process waters
- site drainage waters
- emergency firefighting water
- oil or chemical contaminated waters

- spillages of oils and chemicals

4. You must be able to contain surges and storm water flows. You must provide enough buffer storage capacity to make sure you can achieve this. You can define this capacity using a risk-based approach, for example, by considering the:

- nature of the pollutants
- effects of downstream waste water treatment
- sensitivity of the receiving environment

5. You can only discharge waste water from this buffer storage after you have taken appropriate measures, for example, to control, treat or reuse the water. Discharges to ground, surface water or sewer must be authorised by the appropriate regulator and must comply with any consents or permissions.

6. You must have spill contingency procedures to minimise the risk of an accidental emission of raw materials, products and waste materials, and to prevent their entry into water.

7. Your emergency firefighting water collection system must take account of additional firefighting water flows or firefighting foams. You may need emergency storage lagoons to prevent contaminated firefighting water reaching a receiving water body. This should be considered as part of your fire prevention plan.

8. You must consider and, if appropriate, plan for the possibility that you need to contain or abate accidental emissions from:

- overflows
- vents
- safety relief valves
- bursting discs

If this is not advisable on safety grounds, you must focus on reducing the probability of the emission.

Security measures

9. You must have security measures in place (including staff) to prevent:

- entry by vandals and intruders
- damage to plant and equipment
- theft

- fly-tipping
- arson

10. Facilities must use an appropriate combination of the following measures:

- security guards
- total enclosure (usually with fences)
- controlled entry points
- adequate lighting
- warning signs
- 24-hour surveillance, such as closed-circuit television (CCTV)

Fire prevention

11. There are 3 fire prevention objectives. You must:

- minimise the likelihood of a fire happening
- aim for a fire to be extinguished within 4 hours
- minimise the spread of fire within the site and to neighbouring sites

12. You must have a fire prevention plan that meets the requirements of our [fire prevention plan guidance](#).

Other accident prevention measures

13. You must maintain plant control in an emergency using one or a combination of:

- alarms
- process trips and interlocks
- automatic systems
- manual interventions

14. You must:

- make sure all the measurement and control devices you would need 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

Record keeping and procedures

15. You must:

- keep an up to date record of all accidents, incidents, near misses, changes to procedures, abnormal events, and the findings of maintenance inspections
- 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

2.5 Contingency plan and procedures

1. You must have and implement a contingency plan and management procedures to make certain you comply with all your permit conditions and operating procedures during maintenance or shutdown at your site.

2. Your contingency plan must also contain provisions and procedures to make sure that you:

- do not exceed storage limits in your permit and you continue to apply appropriate measures for storing and handling waste
- stop accepting waste unless you have a clearly defined method of recovery or disposal and enough permitted storage capacity

- as far as possible, know in advance about any planned shutdowns at waste management facilities where you send waste

Your contingency plan must include plans and procedures for circumstances where you cannot send your wastes to other sites due to their planned or unplanned shutdown.

3. If you produce an end-of-waste material at your facility, your contingency planning must consider issues with storage capacity for end-of-waste products.

4. You must make your customers aware of your contingency plan, and of the circumstances in which you would stop accepting waste from them.

5. You must consider whether the sites or companies you rely on in your contingency plan:

- 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

6. Where circumstances mean you could exceed your permitted storage limits or compromise your storage procedures, you must look for alternative disposal or recovery options. You must not discount alternative disposal or recovery options based on extra cost or geographical distance.

7. You must not include unauthorised capacity in your contingency plan. If your contingency plan includes using temporary storage for additional waste on your site, then you must make sure your site is authorised for this storage and you have the appropriate infrastructure in place.

8. Your management procedures and contingency plan must:

- identify known or predictable malfunctions associated with your 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 you have the spare parts, tools, and competent staff needed before you start maintenance

9. Your management system must include procedures for auditing your performance against all these contingency measures and for reporting the audit results to the site manager.

2.6 Plant decommissioning

1. You must consider the decommissioning of the plant at the design stage and make suitable plans to minimise risks during later decommissioning.

2. For existing plant, identify potential decommissioning risks and take steps to address these. Make changes and design improvements as and when plant is upgraded, or when construction and development works are carried out at your site. Examples of design improvements could include avoiding using underground tanks and pipework. If it is not economically possible to replace them, you must protect them by secondary containment or a suitable monitoring programme.

3. You must have and maintain a decommissioning plan to demonstrate that:

- plant will be decommissioned without causing pollution
- the site will be returned to a satisfactory condition

4. Your decommissioning plan should include details on:

- whether you will remove or flush out pipelines and vessels (where appropriate) and how you will empty them 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 your 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)
- the clearing of deposited residues, waste and any contamination resulting from the waste treatment activities

5. You should make sure that equipment taken out of use is decontaminated and removed from the site.

3. Waste pre-acceptance, acceptance and tracking appropriate measures

These are the appropriate measures for waste pre-acceptance, acceptance and tracking at regulated facilities with an environmental permit for the treatment or transfer of WEEE.

3.1 Waste pre-acceptance

1. Except in the case of small one-off deliveries of WEEE, for example those from tradespeople, you must implement waste pre-acceptance procedures so that you know enough about a waste (including its composition) before it arrives at your facility. You need to do this to assess and confirm the waste is technically and legally suitable for your facility. Your procedures must follow a risk-based approach, considering:

- the source and nature of the waste
- its hazardous properties and persistent organic pollutant (POPs) content
- potential risks to process safety, occupational safety and the environment (for example, from the presence of hazardous substances that could be dispersed during treatment)
- knowledge about the previous waste holder

2. You must get the following information in writing when you receive a customer query:

- details of the waste producer including organisation name, address and contact details
- the source of the waste
- full description of the waste including its composition and quantity
- the List of Waste code (European Waste Classification, EWC, code)
- any hazardous properties or presence of any regulated chemicals, for example, POPs
- if WEEE identified as POPs waste on the [classify WEEE pages](#) is described as not being a POPs waste, you should request evidence of the assessment demonstrating this
- with reference to [Annex VII of the WEEE Directive](#), details of any treatment already undertaken

You must also obtain confirmation that the WEEE does not contain a radioactive source other than domestic smoke detectors. If there is a risk of radioactive contamination, for example, in certain types of medical equipment, you must obtain confirmation that the waste is not radioactive, unless your facility is permitted to accept such waste.

3. You must consider whether specific wastes, from among those you are permitted to receive, have properties that can pose unacceptable risks to the site or process. For example, due to:

- a risk of explosion (for example, from gas or aerosol canisters that may be present)
- a risk of fire (for example, from small mixed WEEE containing lithium-ion batteries)

You should establish a list of such wastes and procedures for managing the risks from these wastes.

4. You can verify the pre-acceptance information by contacting or visiting the producer. Dealing with staff directly involved in waste production can help to fully characterise a waste.

5. You must keep pre-acceptance records with the waste acceptance records following receipt of the waste. If an enquiry from a waste producer does not lead to the receipt of waste, you do not need to keep records.

6. You must reassess the information required at pre-acceptance if the:

- waste changes
- process giving rise to the waste changes
- waste received does not conform to the pre-acceptance information

7. In all cases you must reassess the information required at pre-acceptance on an annual basis.

8. The information required and the assessment made at the pre-acceptance stage is to make sure you:

- only accept wastes that are suitable for the site
- avoid unnecessarily accumulating waste
- have enough storage and treatment capacity

3.2 Waste acceptance

1. You must implement waste acceptance procedures to check that the characteristics of the waste received matches the information you obtained during waste pre-acceptance.

This is to confirm that the waste is as expected, and you can accept it. If it is not, you must confirm that you can accept it as a non-conforming waste, or you must reject it. If you are rejecting hazardous waste you must follow the [guidance on the procedure for rejecting hazardous waste](#). Procedures should be documented and auditable.

2. Your procedures must follow a risk-based approach, considering:

- the source, nature and age of the waste
- the waste's hazardous properties
- the presence of persistent organic pollutants
- potential risks to process safety, occupational safety and the environment (for example, the presence of lithium-ion batteries in WEEE)
- knowledge about the previous waste holders

3. If, in the case of small one-off deliveries of WEEE (for example those from tradespeople) you have not received any pre-acceptance information, you must fully assess the load to make sure it is technically and legally suitable for your process.

Storage areas

4. All relevant storage areas (quarantine, reception and general) and treatment processes in your facility must have the physical capacity needed for the waste you receive. You must not receive wastes if this capacity is not available. The amount of waste you receive must also comply with storage limits in your permit.

5. The waste offloading, reception and quarantine areas must have impermeable surfaces with a sealed drainage system. This system must collect all surface water run-off and channel it to a blind sump, unless you can lawfully discharge it.

6. You must clearly designate a materials reception area (or areas). Staff controlling the inspection, reception and validation of materials at the facility, must be trained in their respective roles

Waste acceptance

7. You must weigh each load of waste on arrival to confirm the quantities against the accompanying paperwork, unless alternative reliable systems are available (for example, based upon volume). You must record the weight in the waste tracking system.

8. You must visually check wastes and verify them against pre-acceptance information and transfer documentation before you accept them on site.

9. You must check and validate all transfer documentation and resolve discrepancies before you accept the waste. If you believe the incoming waste classification and

description is incorrect or incomplete, then you must address this with the customer during waste acceptance. You must record any non-conformances. If you have assessed the waste as acceptable for on-site storage or treatment, you must document this.

10. You must have clear criteria that you use to reject non-conforming wastes. You must also have a written procedure for recording, reporting and tracking non-conforming wastes, including notifying the relevant customer or waste producer to prevent reoccurrence.

11. 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 your permit conditions.

12. If there is a known risk of radioactive contamination other than the presence of smoke detectors, you must check the waste to determine that it does not include radioactive material unless your site is permitted to accept that type of radioactive waste.

Quarantine storage

13. You must establish quarantine areas for WEEE and materials that are prohibited, awaiting full inspection, or awaiting testing or removal.

14. Quarantine storage must be for a maximum of fourteen working days.

15. You must have written procedures in place for dealing with wastes held in quarantine, and a maximum storage volume. For some limited and specific cases (for example, the detection of radioactivity), you can extend quarantine storage time if the Environment Agency agrees.

16. Quarantine storage must be separate from all other storage and clearly marked as a quarantine area.

3.3 Waste tracking

1. You must use a waste tracking system to hold up-to-date information about the available capacity of the waste quarantine, reception, general and bulk storage areas of your facility including treatment residues and end of waste product materials.

2. Your waste tracking system must hold all the information generated during:

- pre-acceptance
- acceptance
- non-conformance or rejection
- storage

- repackaging
- treatment
- removal off site

This information must be readily accessible.

3. You must create records and update them to reflect deliveries, on-site treatment and despatches. Your tracking system will also operate as a waste inventory and stock control system. It must include this information as a minimum:

- the date the waste arrived on-site
- the original producer's details (or unique identifier)
- a unique reference number
- waste pre-acceptance and acceptance information
- the quantity delivered
- the intended treatment route
- accurate records of the nature and quantity of wastes held on site, including all hazards – and identifying the primary hazards and presence of any regulated chemicals such as POPs
- where the waste is physically located on site
- where the waste is in the designated treatment route
- the names of staff who have taken any decisions about accepting or rejecting waste streams and who have decided on recovery or disposal options

4. The tracking system must be able to report:

- the total quantity of waste present on site at any one time
- a breakdown by type of the waste quantities you are storing pending treatment or transfer
- the quantity of waste on site compared with the limits authorised by your permit
- the length of time the waste has been on site
- the quantity of end-of-waste product materials on site at any one time, and, where applicable details of any non-conformances and rejections

5. You must store back-up copies of computer records off site. Records must be readily accessible in an emergency.

6. You must hold acceptance records for a minimum of 2 years after you have treated the waste or removed it off site. You may have to keep some records for longer if they are required for other purposes, for example, hazardous waste consignment notes.

4. Waste storage, segregation and handling appropriate measures

These are the appropriate measures for waste storage, segregation and handling at regulated facilities with an environmental permit for the treatment or transfer of WEEE.

4.1 General waste storage

1. You must store waste in locations that minimise the handling of waste. Waste handling must be carried out by competent staff using appropriate equipment.
2. You should design and operate your facility in a way that minimises waste handling.
3. Where possible, you should locate storage areas away from watercourses and sensitive perimeters (for example, those close to public rights of way, housing or schools).
4. You must store all waste within the security protected area of your facility to prevent unauthorised access and vandalism.

Storage duration and capacity

5. You must clearly establish the maximum storage capacity of the site and designated storage areas and you must not exceed these maximum capacities.
6. You must define capacity in pile sizes as well as tonnage. You must regularly monitor the quantity of waste stored on the site and within the designated areas to check against the allowed maximum capacity. You must also monitor the quantities and pile sizes against those set out in your fire prevention plan.
7. Where relevant, you must conform to [Health and Safety Executive \(HSE\) guidance and standards](#).
8. You must not accumulate waste unnecessarily. You must treat wastes, or remove them from the site, as soon as possible. Generally, all wastes must be removed within a maximum of 6 months of receipt. If you have a shorter time period as a permit condition or one is specified in your fire prevention plan you must comply with that condition or the fire prevention plan.
9. You must store all waste in a way that allows easy inspection. You must maintain safe access between piles of wastes. There must always be pedestrian and vehicular access (for example, forklift) to the whole of the storage area.
10. You must store and handle waste in a way that prevents [pests and vermin](#). You must have specific measures and procedures in place to identify and manage any wastes that are causing pests or vermin at your site.

11. Waste storage areas and stored equipment must be subject to frequent inspection, in order to make sure that any leaks, spillages of liquids, dust or loose material are identified and managed appropriately, and fire breaks are maintained. You must keep written records of the inspections. You must rectify and log any spillages of waste.

12. You must not carry out activities that represent a clear fire risk within any storage area. Examples include:

- grinding
- welding or brazing of metalwork
- smoking
- parking of normal road vehicles except while unloading or loading
- recharging forklift truck or power tool batteries

13. You should assess areas of the site where explosive atmospheres could occur. Where appropriate these must be classified into hazardous zones in accordance with the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR).

14. 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.

15. Indoor waste storage areas must have an impermeable surface and you must provide spillage collection facilities.

16. You must use weatherproof covering 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 or cover over a container for small items but in other cases may require the construction of a roofed building.

17. You must also use weatherproof covering in areas used for storage of waste containing hazardous material or fluids where this is necessary to avoid contamination of surface water. This includes the storage of

- lamps
- flat panel display equipment which may contain cold-cathode fluorescent lamp (CCFL) backlights
- broken cathode ray tubes (CRTs) and CRT glass
- shredded plastic that may contain POPs including shredded SMW

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 as persistent organic pollutants from WEEE plastic entering the water environment.

18. Any spillage or leakage resulting from the storage of WEEE or processed materials must be collected without delay. Any containers or surfaces affected by the spillage must be cleaned.

19. You must [train forklift drivers](#) in the handling of waste, to minimise forklift truck damage to the integrity of containers or individual appliances.

20. Any liquids removed from WEEE must be collected and stored in sealed, lidded containers. Containers must be kept closed when not being filled and must be stored within a bunded area to contain any leakage or spillage.

21. You must store the following separately and securely from other WEEE in sealed containers to prevent leakage and spillage. Containers must be closed or stored under cover to prevent the accumulation of rainwater.

- batteries, capacitors and other similar components containing hazardous substances
- any components which may contain residual liquids

22. You must clearly label containers to identify their contents.

23. Where lithium-ion batteries are stored (either separately or as mixed batteries) these must be recognised as a fire hazard and marked accordingly.

4.2 Additional storage requirements for specific categories of WEEE

The following appropriate measures apply to specific WEEE categories in addition to those in the [general waste storage](#) section.

Gas discharge lamps

1. You must store lamps in securely enclosed, robust, sealed and lidded weatherproof containers. They must prevent the ingress of water and the release of any lamp fragments should any lamps break.

2. Containers must be designed and constructed to be sufficiently rigid and strong, so they do not distort or flex when being moved. If you use storage tubes they must be stored and handled in a manner to prevent them from rolling which may cause breakage of the lamps.

3. You must pack lamps carefully into containers to minimise movement and the risk of lamps breaking. Straight fluorescent tubes must be stored separately from irregular

shaped lamps, preferably in separate containers. Containers must not be overfilled – lids must close fully without exerting pressure on the contents.

4. You must handle containers of lamps carefully during loading and unloading to minimise the risk of breakage.

5. Any crushed lamps that have not been treated to remove the mercury must be stored in an airtight sealed drum or airtight sealed heavy-duty impermeable plastic bag resistant to punctures. Any bag that does become damaged must immediately be placed inside a secondary sealed container.

6. You must clean and decontaminate any container that has held broken lamps prior to reuse.

7. You must store any WEEE containing gas discharge lamps such as sun beds and facial tanners in a manner to prevent breakage of the lamps. The lamps should be removed as soon as possible and stored as set out in this section.

Flat panel display (FPD) equipment

8. You must store FPDs under weatherproof covering.

9. You must store FPDs in such a way to prevent breakage. They must not be tipped in bulk or stored loose but should be packed into cages or stillages to minimise movement.

10. You can only store FPDs on pallets if they are stacked and secured to prevent toppling.

11. You must only stack containers of FPDs on top of each other where damage to FPDs will be avoided.

12. Any damaged FPD devices should be prioritised for treatment to minimise any release of mercury vapour.

Cathode ray tube (CRT) equipment

13. You must handle display equipment containing CRTs and bare CRTs carefully and stored it in cages, bulk bags or securely on pallets to prevent breakage. They must not be dropped or stacked in an unstable manner.

14. You must not tip CRT equipment or bare CRTs in bulk.

15. You must store any broken CRTs under weatherproof covering.

Small mixed WEEE (SMW)

16. You must not mechanically compact or compress untreated and unsorted SMW during storage and transport. This is to minimise the dispersion of pollutants and the risk of fires caused by damage to batteries.

Photovoltaic panels

17. Photovoltaic panels must be off-loaded, handled and stored to prevent breakage.

18. Disconnected photovoltaic panels are still capable of generating electricity which can pose a risk of electrocution or fire. You must store them glass side down and take other precautions to minimise these risks.

5. Waste treatment appropriate measures

These are the appropriate measures for waste treatment at regulated facilities with an environmental permit for the treatment of WEEE.

5.1 Preparing WEEE for reuse

1. You should give priority to preparing WEEE so it can be reused either in part or as a whole. If it cannot be reused, you must make sure it is recycled or recovered.
2. You should identify and segregate all WEEE that could be reused as soon as possible to prevent damage to it and to maximise the opportunities for reuse.
3. You must store WEEE designated for reuse separately and transport it securely to an appropriately authorised person for refurbishing or re-sale.
4. WEEE that is POPs waste must not be prepared for reuse – follow the guidance on [how to identify and destroy waste that contains POPs](#).
5. You should treat WEEE that is being prepared for reuse under a suitable standard such as BS EN 50614:2020.
6. If you are preparing WEEE for reuse you must take precautions to make sure there is no pollution of the environment. The standards specified elsewhere in this guidance for storage of components, liquids and other materials apply equally when WEEE is being prepared for reuse.
7. If you are removing or re-charging refrigerants in cooling equipment you must be suitably [qualified to work with F-gas](#).

5.2 General waste treatment

1. Where WEEE cannot be prepared for reuse it must be treated to maximise the recycling and recovery of materials whether that is at the same facility or by further downstream processing.
2. You must fully understand, monitor and optimise your waste treatment process to make sure you treat waste effectively and efficiently. You must not treat waste to deliberately dilute it or mix any hazardous outputs with any non-hazardous outputs.
3. The treated output material must meet your expectations and you must fully classify and characterise them to ensure they are suitable for their intended disposal or recovery route.
4. You must identify and characterise emissions from the process and take appropriate measures to control them at source.

5. You must have up-to-date written details of your treatment activities, and the abatement and control equipment you are using. This should include information about the characteristics of the waste you will treat and the waste treatment processes, including:

- 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 – for example, storage, tanks, treatment and abatement plant design
- details of manual dismantling processes, for example removal of cables and plugs, removal of batteries, capacitors and printer cartridges, draining of oil from radiators
- details of physical treatment processes, for example 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 – for example, time, temperature, pressure
- waste types to be subjected 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
- process instrumentation diagrams

6. You must have up to date written details of the measures you will take during abnormal operating conditions to make sure you continue to comply with permit conditions.

Abnormal operating conditions may include:

- unexpected releases
- start up

- momentary stoppages
- shut down

7. You should use material flow analysis for relevant contaminants in the waste to help identify their flow and fate. You should use the analysis to determine the appropriate treatment for the waste either directly at the site or at any subsequent treatment site.

8. Material flow analysis considers the contaminant quantity in the:

- waste input
- different waste treatment outputs
- waste treatment emissions

9. You should use the analysis and your knowledge of the fate of the contaminants to make sure you correctly treat and either destroy or remove them.

10. The use of material flow analysis is risk-based considering:

- the hazardous properties of the waste
- the restricted chemicals in the waste
- the risks posed by the waste in terms of process safety
- occupational safety and environmental impact
- knowledge of the previous waste holders

11. A treatment process may destroy certain substances in the waste. It could also put substances into the air, water or the ground, or have residues which are sent for disposal. You should minimise the weight of these outputs. The treatment may produce residues for recovery or reuse and you should maximise the weight of these substances.

12. You must not proceed with the treatment if your risk assessment or material flow analysis indicates that losses from a process will cause:

- the breach of an environmental quality standard
- the breach of a benchmark
- a significant environmental impact

13. To track and control the process of change, you must have a written procedure for proposing, considering and approving changes to technical developments, or to procedural or quality changes.

14. You must weigh the amount of WEEE you treat. You must keep an accurate record of all inputs and outputs.

15. You must minimise the release of diffuse emissions to air from activities which may give rise to them such as shredding or granulating by:

- carrying out the activity using enclosed equipment or in an enclosed building
- maintaining the enclosed equipment or buildings under an appropriate pressure
- collecting and directing the emissions to an appropriate abatement system

16. Unless you are preparing WEEE for reuse, you must remove all fluids from WEEE along with those substances, mixtures and components listed in [Annex VII of the WEEE Directive](#).

17. Removal may be a staged process and may be undertaken at different facilities. You must be able to demonstrate either:

- you've removed the substances, mixtures and components listed in [Annex VII of the WEEE Directive](#) from WEEE as required by the conditions of your permit
- those substances, mixtures and components will be removed by downstream processing

18. If you transfer partially treated WEEE to another site you must properly describe it, so the recipient knows which treatments are complete and which still need to be done.

19. Some hazardous items and substances used in electrical equipment in the past you should no longer routinely find. For example, asbestos and capacitors containing polychlorinated biphenyls (PCBs). However, they may still be present in the waste stream. You must be alert to this possibility and ensure you have documented procedures in place to identify and remove them for appropriate disposal.

20. Capacitors in equipment manufactured before 1987 may contain PCB and you should assume that they do unless there is clear evidence to the contrary. Capacitors containing PCB are POPs waste and must be treated in a way that destroys the PCB content.

21. You must monitor and record the outputs of your treatment activity. 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.

22. When removing components, you must safely remove the whole item where breaking it up might:

- pollute the recycle or waste stream
- result in unacceptable emissions

Components that you must always remove whole (unless this guidance states specific circumstances where you do not need to) include:

- capacitors containing polychlorinated biphenyls (PCBs)
- mercury containing components
- toner cartridges
- components with asbestos
- components with refractory ceramic fibres
- components with radioactive substances
- gas discharge lamps
- cathode ray tubes
- electrolyte capacitors containing substances of concern that have a height and diameter greater than 25mm or have a similar volume to a capacitor of those dimensions
- all external batteries and internal batteries that can be removed without the use of specialist tools

23. You may recover the following as fragments or materials following mechanical treatment:

- chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) or hydrofluorocarbons (HFCs), hydrocarbons (HCs)
- external electric cables
- printed circuit boards
- liquid crystal displays (LCDs)
- the fluorescent coating in cathode ray tubes (CRTs)
- plastic with brominated flame retardants (BFRs)

24. You may either:

- sort batteries on site
- send batteries as a mixture of chemistry types to a specialist battery treatment operator for sorting

25. You must pack lithium and lithium-ion batteries removed during treatment in inert material (such as sand or vermiculite) in a sealed container.

26. 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.

27. Indoor WEEE treatment areas must have an impermeable surface and you must provide spillage collection facilities.

28. 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:

- hoppers
- conveyors
- skips
- storage bays

5.3 Treatment of WEEE containing BFRs and POPs

1. You must identify, separate and remove any plastic containing BFRs for further treatment.

2. Some BFRs used in electrical appliances are POPs. An industry-led investigation identified the presence of decabromodiphenyl ether (deca BDE) and other polybrominated diphenyl ethers (PBDE) in some WEEE plastics.

3. You must make sure that any items of WEEE and any component or material fractions derived from the treatment of WEEE that is POPs waste (as defined by [Regulation \(EU\) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants](#)) are treated as required by that regulation. This means the treatment must make sure the POP content is destroyed or irreversibly transformed. The only known cost effective way of doing this is by incineration or similar thermal treatment. You must not recycle this plastic.

Check the guidance on the [classification of WEEE and the presence of POPs](#).

4. POPs may be present in any WEEE category. In large domestic appliance (LDA) white goods (tumble driers, washing machines, dishwashers and cookers only) and cooling equipment, POPs have been shown to be present but in insufficient quantities to make the appliances themselves POPs waste.

5. All other categories of WEEE should be regarded as POPs waste, unless you have clear evidence of the chemical composition of the cables, printed circuit boards and plastic components in the individual devices present that demonstrates it is not.
6. Plastic removed from WEEE that is POPs waste must also be managed as POPs waste.
7. Components that have been found to contain POPs above the POPs waste threshold include printed circuit boards and electrical cable. If you remove these components as a separate stream from any type of WEEE you must treat them and any plastic fractions resulting from their treatment, as POPs waste unless you have clear evidence that proves they are not.
8. The treatment of WEEE that is not POPs waste, but which may contain POPs in some components, may result in fractions where the POPs threshold is exceeded. You must assess plastic containing fractions at each stage in the treatment process to establish whether the threshold is exceeded and, where it is, manage those fractions as POPs waste.
9. You may treat any plastic that is POPs waste to separate the POPs containing fraction from the non-POPs containing plastic. For example, density separation can be used to separate plastic containing all BFRs from that which does not. The non-BFR plastic may then be recycled. You must demonstrate that your process reliably removes all the materials containing relevant concentrations of POPs.
10. Other hazardous chemicals may be used as flame retardants. Antimony trioxide has been widely used as a synergist with a range of BFRs, not just those that are POPs. It has also been widely used in polyvinyl chloride (PVC) cable even where BFRs are absent. It is present in some plastics at concentrations exceeding the hazardous waste threshold. You must consider antimony trioxide when you are classifying any WEEE or plastic containing fraction from the treatment of WEEE.

Preparing WEEE for reuse

11. You must not repair or refurbish for reuse any WEEE that is a POPs waste – it must be treated to destroy the POP.
12. Deca BDE was the last of the PBDEs to be banned from use in electrical equipment under RoHS and came into effect during 2008. Even so, there is evidence that deca BDE is present in some appliances manufactured since then.
13. If you prepare for reuse waste appliances that may be POPs waste, you can only do so if they had an original manufacture date on or after 1 January 2009 and if the appliance is reused within the UK.

14. If you repair or refurbish WEEE from those categories that may be POPs waste and intend to export the equipment for reuse abroad, you must demonstrate that the equipment does not contain POPs.

5.4 Process monitoring

1. At least once a year, for every WEEE stream you treat, you must carry out a mass balance exercise to determine the quantities of output materials derived from a given mass of input material. The batch size must be large enough to make sure you can assess a representative sample of typical input materials.

2. You should use mass balance results to monitor the performance of your site on an ongoing basis.

3. Where process monitoring requires chemical analysis to be carried out on waste fractions and residues produced by your treatment process, this must be carried out by an independent accredited laboratory, using recognised accredited methods where they are available.

4. You must have, and be able to provide, a full description of the material testing and analysis procedures and methods used, which provide details of the calibration methods and reference standards used.

5. You must 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.

6. You must clearly label sample containers 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.

7. You must make sure 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.

8. You must carry out sampling under normal operating conditions unless otherwise stated.

9. Wherever possible you should sample waste fractions and residues in line with relevant guidance, for example:

- [WM3 Waste classification – Guidance on the classification and assessment of waste – Appendix D](#)
- 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
- 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
- CEN/TR 15310 5 Characterization of waste – Sampling of waste – Part 5: Guide on the process of developing a sampling plan

5.5 Treatment of gas discharge lamps

1. The main environmental risk from the treatment of gas discharge lamps is the release of mercury. Mercury may be present as a vapour but will also be present in the phosphor powders, glass, electrodes and end caps.

You must remove mercury from any gas discharge lamps where it is present including fluorescent tubes, compact fluorescent lamps, high intensity discharge lamps, high pressure sodium lamps and cold cathode fluorescent lamps.

2. You must not manually break lamps that may contain mercury.

3. You can only crush lamps to reduce volume before transport using dedicated crushing equipment designed and built specifically for that purpose.

4. You must make sure you capture and contain mercury vapours, dusts and powders when you treat lamps – including if you crush for volume reduction. This includes providing suitable extraction and abatement for the receipt and handling of crushed but otherwise untreated lamps.

5. Whether you are crushing for volume reduction or carrying out full treatment, you must make sure all equipment is sealed and operated under negative pressure. You must channel and abate all exhaust gases through a filter system that captures dust and mercury. This will require the use of both a HEPA (high efficiency particulate air) filter and a sulphur-impregnated carbon filter.

6. You must regularly check, maintain and replace as necessary all parts including seals and filters to make sure they remain fit for purpose. You must retain evidence of maintenance procedures and the replacement of parts for at least 2 years.

7. You must immediately clean up spillages of broken or crushed lamp material using appropriate equipment, such as an industrial vacuum cleaner with suitable filters, to retain mercury vapour and dust. Used filters and all spill materials that cannot be recycled must be stored in sealed containers, labelled as mercury containing waste and disposed of at an appropriate authorised site.
8. Your recycling process must keep phosphor powders separate from recycled materials to minimise contamination by mercury. You must store removed phosphor powders in airtight sealed containers. You must store other processed materials in secure containers.
9. The phosphor powders should be treated to recover rare earth elements where that technology is available and is economically viable.
10. You must treat lamps containing metallic sodium so that no metallic sodium remains.
11. Certain specialist lamps may pose additional hazards. For example, xenon lamps used in cinema applications may contain thorium 232 and are also highly pressurised. Quantities of radioactive material are very small and below the threshold that would require a radioactive substances permit. These lamps can be recycled with other lamps but you may need to take additional precautions when handling them.
12. Printed circuit boards and other plastic from lamps may contain flame retardants. You must manage these as containing BFRs including POPs unless you can demonstrate they are absent.

Process monitoring for the treatment of lamps containing mercury

The following monitoring requirements and limits apply to the specified fractions derived from lamp recycling.

13. Recycled materials including glass, plastic and metal fractions must be sampled and tested for mercury at least once every six months. The limit value is 10mg/kg total mercury for glass, plastic and metal.
14. Phosphor powders must be sampled and tested for mercury at least once every six months with a limit value of 200mg/kg total mercury.

5.6 Treatment of cathode ray tube equipment

1. Hazardous substances present in cathode ray tubes include high concentrations of lead oxide in the neck glass (~40%), funnel glass (~20%) and solder glass or frit (~75%). The phosphor powders coating the screens contain compounds of transition or rare earth elements, often zinc or yttrium. The plastic casings as well as cables and printed circuit boards may contain BFRs that are POPs.

When you treat CRT equipment you must remove the following items and materials:

- activated coatings from screens
- printed circuit boards greater than 10 square centimetres in area
- capacitors identified in [Annex VII of the WEEE directive](#)
- plastics containing BFRs
- external electrical cables

2. The plastic casings of CRT TVs and monitors are known to often contain high concentrations of BFRs including POPs. Cables and printed circuit boards may contain them too. You must manage CRT equipment and all separated plastic from CRT equipment as POPs waste unless you can prove it is not.

3. You must take steps to minimise the uncontrolled breakage of CRTs, especially when the deflection coil is being removed.

4. You must separate panel glass (low lead content) from the neck, funnel and frit glass that contains much higher lead concentrations. The cleaned panel glass may be suitable for use as an aggregate in certain applications.

5. You must take measures to minimise the release of activated coatings, particularly when the CRT is broken to remove the electron gun.

6. You must split the screen from the funnel and then remove the activated coatings – this is usually done by suction.

7. All activities involving the breaking or splitting of CRTs as well as the removal of the activated coatings must take place in a controlled environment that minimises the release of any dust. For example, within a booth provided with local exhaust ventilation and suitable abatement.

8. You must only mechanically process equipment containing CRTs if you can achieve effective separation of the panel glass from the all of the activated coatings so they are removed as a separate fraction.

9. Mechanical processing of CRT equipment or the crushing of CRT glass must be provided with an adequate dust extraction and abatement system to make sure dust release is minimised.

Process monitoring for the treatment of CRT display equipment

10. Where your process produces a crushed panel glass fraction for recycling, you must sample and test it at least once every six months for:

- lead (as lead oxide) with a limit value of 3% lead oxide
- sulphur with a limit value of 5mg/kg sulphur

5.7 Treatment of FPD equipment

1. Many FPDs use cold-cathode fluorescent lamps (CCFLs) as back-lights which contain mercury. Unless you can clearly identify a display as having a plasma screen or a screen backlit by LED or organic LED (OLED), you must treat all FPDs as though they contain cold cathode fluorescent lamps. The plastic casings as well as cables and printed circuit boards may contain BFRs that are POPs.

2. When you treat FPDs you must remove the following items and materials:

- cold cathode fluorescent lamps (CCFLs)
- liquid crystal displays
- printed circuit boards greater than 10 square centimetres in area
- capacitors identified in [Annex VII of the WEEE Directive](#)
- plastics containing BFRs
- external electrical cables
- batteries (where the FPD forms part of a portable device)

3. If manually removing CCFLs, you must remove CCFLs very carefully to minimise breakage and the release of mercury. You must only remove them within a controlled environment such as a sealed booth with local exhaust ventilation.

4. If mechanically removing CCFLs, you must do this in a way that avoids any contamination of other fractions with mercury. You must only remove them within a controlled environment such as a sealed booth with local exhaust ventilation.

5. You can only shred whole or partially dismantled FPDs containing CCFLs if you can clearly demonstrate that:

- there is no fugitive release of mercury
- all releases from the process are channelled and abated to capture dust and mercury vapour
- recycled outputs are not contaminated by mercury to a significantly greater extent than those produced by manual treatment

This must include determining the total mercury concentration in all output fractions and residues from the process.

6. Whether using mechanical or manual processes, you must use appropriate air extraction, abatement and filter systems to capture dust and mercury vapour. This will require using both a HEPA filter and a carbon filter.

7. Once removed, CCFLs must be treated following the guidance on treating lamps containing mercury. Where that treatment does not follow on immediately, you must pack CCFLs to prevent breakage and store them in securely lidded and weatherproof containers.

8. You must remove broken lamps from the working areas. You must collect any residues from broken lamps using an industrial vacuum cleaner with suitable filters to retain mercury vapour and dust. You must store all broken lamp debris in appropriate, air-tight containers, until they can be treated in line with the guidance on gas discharge lamps.

9. The plastic casings of FPD televisions and monitors, as well as the cables and printed circuit boards, are known to often contain high concentrations of BFRs including POPs. You must manage FPD equipment and all separated plastic from FPD equipment as POPs waste unless you can prove they are not.

Process monitoring for the treatment of FPD equipment

10. Where you use a mechanical process to remove CCFLs from FPD equipment, or you use a shredding process to shred equipment containing CCFLs, you must carry out the following monitoring:

- all recycled material fractions must be sampled and tested for mercury at least once every 6 months with a limit value of 1mg/kg total mercury
- fines for disposal must be sampled and tested for mercury at least once every 6 months with a limit value of 200mg/kg

5.8 Treatment of SMW

1. SMW can consist of many different categories of WEEE, including those requiring specific forms of treatment such as cathode ray tube equipment, gas discharge lamps and cooling equipment containing refrigerants. You must identify items such as these and remove them for appropriate treatment.

2. If you treat separately any particular categories of small WEEE, the guidance in this section still applies subject to any category specific guidance that may exist, for example for display equipment.

3. Some appliances found in SMW are known to contain high concentrations of POPs in casings, cables and printed circuit boards. You must manage SMW and all plastic containing fractions from treating SMW as POPs waste unless you can prove they are not.

4. You must remove the following items from SME before mechanical treatment:

- any WEEE or 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 a FPD of greater than 100 square centimetres in area
- any WEEE containing asbestos or refractory ceramic fibres identified in [Annex VII of the WEEE Directive](#)
- any WEEE or component containing radioactive substances, such as ionization smoke detectors
- any WEEE containing CFCs, HCFCs, HFCs or hydrocarbon gases, such as small refrigeration equipment, portable air conditioners and dehumidifiers
- batteries from any WEEE that uses a battery as its principal power source where that can be done without the use of specialist tools – for example, where the batteries are external or where they are intended to be replaced by the user during use
- any non-WEEE items that may contain fluids or hazardous substances, such as petrol lawnmowers or gas cylinders

5. You must remove the following items from SMW before mechanical treatment unless your specific process makes sure they remain whole and intact, and you have effective procedures to remove them following that treatment:

- capacitors identified in [Annex VII of the WEEE Directive](#)
- ink and toner cartridges

6. You must also remove the following from SMW, but you can do this as material streams after mechanical treatment:

- external electrical cables
- printed circuit boards from mobile phones and from other devices if greater than 10 square centimetres in area
- plastics containing BFRs

7. If you mechanically treat SMW, you must provide and use an adequate dust extraction and abatement system to minimise dust release.

Process monitoring for the treatment of SMW

8. Where you use a mechanical process to shred SMW you must carry out the following monitoring:

- the physically finest non-metallic fraction – you must sample and test for mercury at least once every 6 months with a limit value of 1mg/kg total mercury
- the weight of batteries recovered per tonne of input material – you must establish this at least once every 6 months

5.9 Treatment of IT, telecommunications and business equipment

1. This can consist of many different categories of WEEE including those requiring specific forms of treatment such as cathode ray tube equipment. You must identify items like these and remove them for appropriate treatment.

2. Some appliances found in IT, telecommunications and business equipment are known to contain high concentrations of POPs. You must manage this waste stream and all plastic containing fractions arising from the treatment of it as POPs waste, unless you can prove they are not.

3. If you mechanically treat IT, telecommunications and business equipment, you must meet the [standards for small mixed WEEE](#). You must remove replaceable batteries and FPD of greater than 100 square centimetres in area before mechanical treatment.

Process monitoring for the treatment of IT, telecommunications and business equipment

4. Where you use a mechanical process to shred IT, telecommunications and business equipment, you must sample the physically finest non-metallic fraction and test for mercury at least once every 6 months, with a limit value of 1mg/kg total mercury.

5.10 Treatment of LDA

1. LDA that may be treated in conventional metal shredders is limited to only:

- washing machines
- vented and condensing tumble dryers
- dishwashers
- cookers

2. You must have effective procedures in place to ensure that other types of WEEE are removed from mixed loads of LDA before it is treated by shredding, especially:

- fridges, freezers and any other cooling equipment

- heat pump tumble dryers
- any WEEE that contains oil or other liquids
- any WEEE that is POPs waste

3. You must also remove the following items when treating LDA, but you can do this as material streams after mechanical treatment, provided any capacitors remain whole and intact:

- capacitors identified in [Annex VII of the WEEE Directive](#)
- printed circuit boards if greater than 10 square centimetres in area
- external electrical cables
- plastics containing BFRs
- batteries

5.11 Treatment of photovoltaic panels

1. Photovoltaic panels may contain hazardous substances such as lead (in solder), cadmium telluride and compounds of selenium (in the semiconductor layer of non-silicon based photovoltaic panels).

You must establish, maintain and use an effective process for identifying non-silicon based photovoltaic panels.

2. You must remove the lead from all photovoltaic panels and you must remove the hazardous semi-conductor layer from non-silicon based photovoltaic panels.

Process monitoring for the treatment of photovoltaic panels

3. Where you shred non-silicon based photovoltaic panels, you must sample and test the recycled glass fraction at least once every 6 months for cadmium with a limit value of 10mg/kg cadmium.

5.12 Post-shredding treatments

1. You may use a range of separation technologies 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.

2. You must fully characterise and classify fractions produced by these processes.

3. Where materials originate from WEEE that was POPs waste, fractions of plastic containing brominated flame retardants must be managed as POPs waste.
4. 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.
5. You must fully characterise and classify (including for POPs) process solutions and washings from density separation processes before determining suitable disposal options. POPs originating from appliances that were POPs waste must be destroyed.
6. You must only use waste codes for single material outputs, for example plastic, where the treatment involved is aimed at producing a pure material fraction. Contamination by other materials must be negligible.

Process monitoring for the separation of BFR containing plastic

7. You must assess at least once every 3 months how much BFR containing plastic is present in any fraction destined for recycling.

5.13 Record keeping for all treatment residues

1. You must record in the waste tracking system:
 - 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
 - what the treatment residues, treated components and fractions are

6. Emissions control appropriate measures

These are the appropriate measures for emissions control at regulated facilities with an environmental permit for the treatment or transfer of WEEE.

You must identify, characterise and control emissions from your activities that may cause pollution. See our [guidance on controlling emissions](#).

6.1 Point source emissions to air

1. You must contain the waste treatment process to make sure that you collect, extract and direct all process emissions to an appropriate abatement system for treatment before release.

2. You must identify the main chemical constituents of the site's point source emissions as part of the site's inventory of emissions to air. You must include the speciation of volatile organic compounds (VOCs) if you have identified them in the emissions inventory and it is practicable to do so.

3. You must assess the fate and impact of the substances emitted to air, following the Environment Agency's [air emissions risk assessment methodology](#).

4. To reduce point source emissions to air (for example, dust, volatile organic compounds and odour) from the treatment of waste, you must use an appropriate combination of abatement techniques, including one or more of the following systems:

- adsorption
- fabric filter
- wet scrubbing
- HEPA filter
- condensation and cryogenic condensation
- cyclone
- electrostatic precipitator (ESP)
- thermal oxidation

5. You must assess and design vent and stack locations and heights to make sure dispersion capability is adequate.

6. Where monitoring is required, including for odour, you must install a suitable monitoring point. Monitoring points will be required to meet [MCERTS standards](#).

7. Your procedures must make sure you correctly install, operate, monitor and maintain abatement equipment. For example, this includes monitoring and maintaining:

- appropriate flow and chemical concentration of scrubber liquor
- the handling and disposal or regeneration of spent scrubber or filter medium

6.2 Fugitive emissions to air (including odour)

1. You must use appropriate measures to prevent emissions of dust, mud, litter and odour. See our guidance on [suggested appropriate measures to control dust, mud and litter](#), and to [control odour](#).

2. You must design, operate and maintain storage and treatment plant in a way that prevents fugitive emissions to air, including dust, organic compounds and odour. Where that is not possible, you must minimise these emissions.

Storage and treatment plant includes associated equipment and infrastructure such as:

- shredders
- sorting equipment
- conveyors
- skips or containers
- building fabric, including doors and windows
- pipework and ducting

3. You must make sure fugitive emissions are collected and directed to appropriate abatement and your treatment plant must use high integrity components (for example, seals or gaskets).

4. You must use your waste pre-acceptance, waste acceptance and site inspection checks and procedures to identify and manage wastes that could cause, or are causing, fugitive emissions to air. When you identify any of these wastes you must:

- take appropriate, risk assessed measures to prevent and control emissions
- prioritise their treatment or transfer

5. Where necessary, to prevent fugitive emissions to air from the storage and handling of odorous or dusty wastes, you should use a combination of the following measures.

You should store and handle the waste within a building vented to an effective abatement system for treatment.

You should use fully enclosed material transfer and storage systems and equipment, for example:

- conveyors
- hoppers
- containers
- tanks and skips

You should keep building doors and windows shut to provide containment, other than when access is required for loading or unloading

You should keep enclosed 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 emissions sources.

6. Where a dust management plan is required, you must develop and implement it following our guidance on [emissions management plans for dust](#).

Maintenance and cleaning

7. You must set up a leak detection and repair programme. You must use it to promptly identify and mitigate any fugitive emissions from treatment plant and associated infrastructure (such as pipework, conveyors, tanks).

8. You must regularly inspect and clean all waste storage and treatment areas, equipment (including conveyor belts) and containers. You must contain any residues collected during cleaning.

9. Your maintenance and cleaning schedules must make sure that your plant is regularly cleaned to avoid large-scale decontamination activities.

10. You must take measures to prevent the corrosion of plant and equipment (for example, conveyors or pipes). This includes:

- selecting and using appropriate construction materials
- lining or coating equipment with corrosion inhibitors
- regularly inspecting and maintaining plant

11. You must have an appropriate regular maintenance programme covering all buildings, plant and equipment. This must also include protective equipment such as air ventilation and extraction systems, curtains and fast-action doors used to prevent and contain fugitive releases.

Odorous wastes

12. You must have procedures to minimise the amount of time odorous wastes spend in your storage and handling systems (for example, pipes, conveyors, hoppers, tanks). In particular, you must have provisions to manage waste during periods of peak volume.

13. You must have measures to contain, collect and treat odorous emissions, including using contained buildings and plant or equipment with appropriate air extraction and abatement. We do not consider masking agents to be appropriate measures for the treatment of odorous emissions.

14. You must monitor and maintain odour abatement systems to ensure optimum performance. For example, you should make sure that scrubber liquors are maintained at the correct pH and replenished or replaced at an appropriate frequency.

15. Contaminated waters have potential for odours. You must store them in containers or enclosed tanks that are vented to an abatement system.

16. Where you expect odour pollution at sensitive receptors, or it has been substantiated, you must periodically monitor odour emissions using European (EN) standards. For example, either:

- dynamic olfactometry according to EN 13725 to determine the odour concentration
- EN 16841-1 or -2 to determine the odour exposure

17. If you are using alternative methods for which no EN standards are available (for example, estimating odour impact), you should use ISO, national or other international standards to make sure you use data of an equivalent scientific quality. You must set out the monitoring frequency in the odour management plan.

18. Where you expect odour pollution at sensitive receptors, or it has been substantiated, you must also set up, implement and regularly review an odour management plan. It must be part of your management system and include all of the following elements:

- actions and timelines to address any issues identified
- a procedure for conducting odour monitoring
- a procedure for responding to identified odour incidents, for example, 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 reduction measures

19. Where an odour management plan is required, you must develop and implement it following our guidance on [odour management plans](#).

6.3 Emissions of noise and vibration

1. You should design the layout of the facility to locate potential sources of noise (including building exits and entrances) away from sensitive receptors and boundaries. You should locate buildings, walls, and embankments so they act as noise screens.

2. You must use appropriate measures to control noise, for example, including:

- adequately maintaining plant or equipment parts that may become noisier as they deteriorate – such as bearings, air handling plant, building fabric, and specific noise attenuation kit associated with plant or machinery
- closing doors and windows of enclosed areas and buildings
- avoiding noisy activities at night or early in the morning
- minimising drop heights and the movement of waste and containers
- using broadband (white noise) reversing alarms and enforcing the on-site speed limit
- using low-noise equipment, for example, drive motors, fans, compressors and pumps
- adequately training and supervising staff
- where possible, providing additional noise and vibration control equipment for specific noise sources – such as noise reducers or attenuators, insulation, or sound-proof enclosures

3. Where you expect noise or vibration pollution at sensitive receptors, or it has been substantiated, you must create, use and regularly review a noise and vibration management plan. This must be part of the environmental management system and must include:

- actions and timelines to address any issues identified
- a procedure for conducting noise and vibration monitoring
- a procedure for responding to identified noise and vibration events, for example, complaints

4. The noise and vibration management plan should also include a noise and vibration reduction programme designed to:

- identify the sources of noise and vibration
- measure or estimate noise and vibration exposure

- characterise the contributions of the sources
- implement prevention and reduction measures

5. Where a noise and vibration management plan is required, you must develop and implement it following our guidance on [noise and vibration management plans](#).

6.4 Point source emissions to water and sewer

1. You must identify the main chemical constituents of the site's point source emissions to water and sewer as part of the site's inventory of emissions.

2. You must assess the fate and impact of the substances emitted to water and sewer following the Environment Agency's [risk assessment guidance](#).

3. Except for uncontaminated surface water, for example roof drainage, discharges to water or sewer must comply with the conditions of an environmental permit or trade effluent consent. Relevant sources of waste water include (but are not limited to):

- water or condensate collected from treatment processes
- waste compactor runoff
- vehicle washing
- vehicle oil and fuel leaks
- washing of containers
- spills, leaks and leaching in waste storage areas
- loading and unloading areas

4. POPs may leach or wash out in particulates from some wastes, such as shredded WEEE plastic or granulated cable, if stored without weatherproof covering. You must prevent the release of POPs to water or sewer either by providing weatherproof covering or treating the affected water to remove the POPs.

5. To reduce emissions to water and sewer, if you need to treat waste water before discharge or disposal, you must use an appropriate combination of treatment techniques, including one or more of the following:

- preliminary or primary treatment – for example, equalisation, neutralisation or physical separation
- physico-chemical treatment – for example, adsorption, distillation or rectification, precipitation, chemical oxidation or reduction, evaporation, ion exchange, or stripping

- biological treatment – for example, activated sludge process or membrane bioreactor
- nitrogen removal – for example, nitrification and denitrification
- solids removal – for example, coagulation and flocculation, sedimentation, filtration or flotation

6.5 Fugitive emissions to land and water

1. You must use appropriate measures to control potential fugitive emissions and make sure that they do not cause pollution. See the guidance on [emissions to water](#) and [leaks from containers](#).

2. You must have these in all operational areas of the facility:

- an impermeable surface
- sealed construction joints
- spill containment kerbs

3. For outdoor operational areas you must also have a sealed drainage system.

4. Your 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.

5. You must collect and treat separately each water stream generated at the facility, for example, surface runoff water or process water. Separation must be based on pollutant content and treatment required. You must make sure you segregate uncontaminated water streams from those that require treatment.

6. You must use suitable drainage infrastructure to collect surface drainage from areas of the facility where you store, handle and treat waste. You must also collect washing water and occasional spillages.

7. Depending on the pollutant content, you must either:

- recirculate what you have collected
- discharge it in accordance with an environmental permit or trade discharge consent
- send it for further treatment

8. You must have design and maintenance provisions in place to detect and repair leaks. These must include regularly monitoring, inspecting and repairing equipment and minimising underground equipment and infrastructure.

9. You should provide appropriate buffer storage capacity at your facility to store waste waters, taking into account:

- potential abnormal operating scenarios and incidents
- the nature of any polluting substances and their impact on the downstream waste water treatment plant and receiving environment

10. You must have appropriate measures in place to monitor, treat and reuse the water held in the buffer storage before discharging.

11. You must take measures to prevent emissions from washing and cleaning activities, including:

- directing liquid effluent and wash-waters to foul sewer or collecting them in a sealed system for off-site disposal – you must not discharge them to 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 any surface water drains
- preparing cleaning or disinfection solutions in contained areas of the site and never in areas that drain to the surface water system

12. Where relevant, you must have measures to prevent pollution from the on-site storage, handling and use of oils and fuels. Follow the guidance on [oil storage regulations for businesses](#).

Spill response plan

13. You must produce and implement a spillage response plan and train staff to follow it and test it.

14. Your procedures and associated training must make sure you deal with spillages immediately.

15. You must keep spill kits 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.

16. You must take measures to stop spillages from entering drains, channels, gullies, watercourses and unmade ground. You must make available proprietary sorbent materials, sand or drain mats for use when required.

17. You must make sure your spillage response plan includes information about how to recover, handle and correctly dispose of waste produced from a spillage.

Designing and maintaining surfacing and subsurface structures

18. For subsurface structures, you must:

- establish and record the routing of all site drains and subsurface pipework
- identify all sub-surface sumps and storage vessels
- engineer systems to minimise leakages from pipes and make sure they are detected quickly if they do occur, particularly where hazardous substances are involved
- provide secondary containment or leakage detection for sub-surface pipework, sumps and storage vessels
- establish an inspection and maintenance programme for all subsurface structures, for example, pressure tests, leak tests, material thickness checks or CCTV

19. For surfacing, you must design appropriate surfacing and containment or drainage facilities for all operational areas, taking into account:

- collection capacities
- surface thicknesses
- strength and reinforcement
- falls
- materials of construction
- permeability
- resistance to chemical attack
- inspection and maintenance procedures

20. You must have an inspection and maintenance programme for impermeable surfaces and containment facilities.

Tanks and bunding

21. You must bund all above-ground tanks containing liquids whose spillage could be harmful to the environment. Bunds must:

- be impermeable and resistant to the stored materials
- have no outlet (that is, no drains or taps) and drain to a blind collection point
- have pipework routed within bunded areas with no penetration of contained surfaces
- be designed to catch leaks from tanks or fittings
- have a capacity greater than 110 percent of the largest tank or 25 percent 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

7. Emissions monitoring and limits appropriate measures

These are the emissions limits and appropriate measures for monitoring emissions to air and water at regulated facilities with an environmental permit for the treatment or transfer of WEEE.

We may set emission limits and monitoring requirements in your permit, based on your emissions inventory and [environmental risk assessment](#).

Where you are required to monitor emissions to comply with the requirements of your environmental permit you must follow our [monitoring guidance](#) when carrying this out.

You must create and maintain an inventory (emissions inventory) of point source emissions to air and water (including emissions to sewer) for your facility.

7.1 Point source emissions to air

1. Your facility's emissions inventory must include information about the relevant characteristics of point source emissions to air, such as the:

- average values and variability of flow and temperature
- average concentration and load values of relevant substances and their variability
- flammability, lower and higher explosive limits and reactivity
- presence of other substances that may affect the waste gas treatment system or plant safety – for example, oxygen, nitrogen, water vapour, dust

2. Monitoring locations must meet MCERTS standards. Monitoring must be carried out using MCERTS qualified accredited methods and MCERTS certified staff. Further guidance can be found in our guidance [M1 sampling requirements for stack emissions monitoring](#).

3. You must carry out emissions monitoring 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.

4. You must monitor point source emissions to air from your treatment plant for the following substances using the monitoring standards stated. You must monitor at the frequencies stated and meet the specified emission limits unless your permit states alternative requirements.

Channelled emissions to air from all mechanical treatment of WEEE

Dust

Monitoring standard – EN 13284-1.

Frequency – every 6 months.

Emission limit – 5mg/m³ (where it is inappropriate to fit a fabric filter due to the potential effects of deflagration on the filter, the limit is 10mg/m³).

TVOC

Monitoring standard – EN 12619.

Frequency – every 6 months.

In addition, the following monitoring is required from all mechanical treatment of WEEE when the substance concerned is identified as relevant based on your facility's emissions inventory.

Dioxin-like PCBs

Monitoring standard – EN 1948-1, -2 and -4.

Frequency – every 12 months.

PCDD/F

Monitoring standard – EN 1948-1, -2 and -3.

Frequency – every 12 months.

BFRs

Frequency – every 12 months.

Metals and metalloids excluding mercury

Monitoring standard – EN 14385.

Frequency – every 12 months.

Channelled emissions to air from the treatment of WEEE containing mercury

Total mercury

Monitoring standard – EN 13211.

Frequency – every 3 months.

Emission limit – 7 µg/m³.

Periodic monitoring results should normally consist of the average value of 3 consecutive measurements of at least 30 minutes each. For some parameters, due to analytical limitations, a longer sampling period may be required.

Monitoring frequencies may be reduced if the emission levels are proven to be sufficiently stable over time.

7.2 Point source emissions to water or sewer

1. Your facility's emissions inventory must include information about the relevant characteristics of point source emissions to sewer or water, such as:

- average values and variability of flow, pH, temperature, and conductivity
- average concentration and load values of relevant substances and their variability – for example, COD (chemical oxygen demand) and TOC (total organic carbon), nitrogen species, phosphorus, metals, priority substances or micropollutants
- data on bio-eliminability – for example, BOD (biological oxygen demand), BOD to COD ratio, Zahn-Wellens test, biological inhibition potential, for example, inhibition of activated sludge

2. For relevant emissions to water or sewer identified by the emissions inventory, you must carry out monitoring of key process parameters (for example, waste water flow, pH, temperature, conductivity, or BOD) at key locations. For example, these could either be at the:

- inlet or outlet (or both) of the pre-treatment
- inlet to the final treatment
- point where the emission leaves the facility boundary

3. For the following types of discharges, you must monitor point source emissions to water or sewer for the substances listed using the monitoring standards stated. You must meet the specified emission limits unless your permit states otherwise.

Direct discharges to a water body from all sites carrying out the mechanical treatment of WEEE

TOC

Monitoring standard – EN 1484.

Frequency – every month.

Emission limit – 60mg/l.

COD

Frequency – every month.

Emission limit – 180mg/l.

The requirement is to monitor for either total organic carbon or chemical oxygen demand.

Total suspended solids

Monitoring standard – EN 872.

Frequency – every month.

Emission limit – 60mg/l.

Discharges to sewer or a water body from all mechanical treatment of WEEE

Hydrocarbon oil index

Monitoring standard – EN ISO 9377-2.

Frequency – every month.

Emission limit – 10mg/l.

Discharges to sewer or a water body from all mechanical treatment of WEEE, when the substance concerned is identified as relevant based on your facility's emissions inventory

Metals and metalloids

Monitoring standard – various EN standards available.

Frequency – every month.

Emission limits:

- arsenic, 0.05mg/l
- cadmium, 0.05mg/l
- chromium, 0.15mg/l
- copper, 0.5mg/l

- lead, 0.1mg/l
- nickel, 0.5mg/l
- mercury, 0.005mg/l
- zinc, 1.00mg/l

PFOA, PFOS and deca BDE

Frequency – every 6 months.

Monitoring frequencies may be reduced if the emission levels are proven to be sufficiently stable over time.

Monitoring frequencies for discharges to sewer may be reduced if the downstream waste water treatment plant abates the pollutants concerned.

8. Process efficiency appropriate measures

These are the appropriate measures for process efficiency at regulated facilities with an environmental permit for the treatment or transfer of WEEE.

For your facility, you must monitor and review the annual quantity of:

- water, energy and raw materials used
- residues and waste water produced

You must do this at least once every year.

8.1 Energy efficiency (installations only)

1. You must create and implement an energy efficiency plan at your facility. This must:

- define and calculate the specific energy consumption of the activity (or activities) you carry out and waste stream(s) you treat
- set annual key performance indicators – for example, specific energy consumption (expressed in kWh/tonne of waste processed)
- plan periodic improvement targets and related actions

2. You must regularly review and update your energy efficiency plan as part of your facility's management system.

3. You must have and maintain an energy balance record for your facility. This must provide a breakdown of your energy consumption and generation (including any energy or heat exported) by the type of source (electricity, gas, conventional liquid fuels, conventional solid fuels, and waste). You should provide Sankey diagrams or energy balances to show how energy is used in your waste treatment processes.

4. You must regularly review and update your energy balance record as part of your facility's management system, alongside the energy efficiency plan.

5. You must have operating, maintenance and housekeeping measures in place in relevant areas, for example, for:

- air conditioning, process refrigeration and cooling 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, for example, optimising excess air
- other maintenance relevant to the activities within the facility

6. You must have measures in place to avoid gross energy inefficiencies. These should include, for example:

- insulation
- containment methods (such as seals and self-closing doors)
- avoiding unnecessary discharge of heated water or air (for example, by fitting simple control systems such as timers and sensors)

7. You should implement additional energy efficiency measures at the facility as appropriate, following our guidance on [energy efficiency standards for industrial plants](#).

8.2 Raw materials (installations only)

1. You must maintain a list of the raw materials used at your facility and their properties. This includes auxiliary materials and other substances that could have an environmental impact.

2. You must regularly review the availability of alternative raw materials and use any suitable ones that are less hazardous or polluting. This should include, where possible, substituting raw materials with waste or waste-derived products.

3. You must justify the continued use of any substance for which there is a less hazardous alternative.

4. You must have quality assurance procedures in place to control the content of raw materials.

8.3 Water use (installations only)

1. You must take measures to make sure you optimise water consumption to:

- reduce the volume of waste water generated

- prevent or, where that is not practicable, reduce emissions to soil and water

2. Measures you must take include:

- implementing a water saving plan (involving establishing water efficiency objectives, flow diagrams and water mass balances)
- optimising the use of washing water (for example, 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
- the use of water for vacuum generation (for example, using liquid ring pumps with high boiling point liquids), where relevant

3. You must carry out a regular review of water use (a water efficiency audit) at least every 4 years.

4. You must also:

- produce flow diagrams and water mass balances for your activities
- establish water efficiency objectives and identify constraints on reducing water use beyond a certain level (usually this will be site specific)
- identify the opportunities for maximising reuse and minimising use of water
- have a timetabled improvement plan for implementing additional water reduction measures

5. To reduce water use and associated emissions to water, you should apply these general principles in sequence:

- use water efficient techniques at source where possible
- 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

6. If you cannot use uncontaminated roof and surface water in the process, you should keep it separate from other discharge streams – at least until after you have treated the contaminated streams in an effluent treatment system and have carried out final monitoring

7. You should establish the water quality requirements associated with each activity and identify whether you can substitute water from recycled sources. Where you can, include it in your improvement plan.

8. Where there is scope for reuse (possibly after some form of treatment) you should keep less contaminated water streams, such as cooling waters, separate from more contaminated streams.

9. You must minimise the volume of water you use for cleaning and washing down by:

- vacuuming, scraping or mopping in preference to hosing down
- reusing wash-water (or recycled water) where practicable
- using trigger controls on all hoses, hand lances and washing equipment

10. You must directly measure fresh water consumption and record it regularly at every significant usage point, ideally on a daily basis.

8.4 Waste minimisation, recovery and disposal

1. You must have and implement a residues management plan that:

- minimises the generation of residues arising from waste treatment
- optimises the reuse, regeneration, recycling or energy recovery of residues, including packaging
- makes sure you properly dispose of residues where recovery is technically or economically impractical

2. Where you must dispose of waste, you must carry out a detailed assessment identifying the best environmental options for waste disposal.

3. You must review options for recovering and disposing of waste produced at the facility on a regular basis. You must do this as part of the management system to make sure you are:

- still using the best environmental options
- promoting the recovery of waste where technically and economically viable