# Non-Technical Summary

The installation operated by Halo Battery Recycling Ltd (HBR) is a hazardous waste installation, primarily involved in the treatment and processing of Lead-acid batteries.

Lead-acid batteries are a ubiquitous form of waste, classed as hazardous due to the Lead content of the battery, which is a toxic metal, and the sulphuric acid electrolyte in the battery which is corrosive.

Lead-acid batteries are typically found in the following applications:

* Automotive (Car, van, lorry engine ignition)
* Uninterruptible power supply systems from alarm and lighting power back-ups to telephone and IT systems power back-up
* Motive power in electric forklifts, trains, and golf carts etc….
* Portable power in leisure activities (boating and caravans, for example)

Due to the dynamics of Industry services, as well as the mechanisms by which Lead-acid batteries are managed in the waste (end-of-life) supply chain, some commercial contracts and waste management requirements involve the contractual requirement to remove Lead-acid batteries along with other types of battery chemistry (such as Nickel Cadmium batteries also used in power back-up systems or Lithium-Ion batteries in vehicles). Whilst these batteries are not to be processed at the installation they are intended to be stored, handled, and repackaged for other ABTO’s to subsequently complete their recycling.

It makes environmental and commercial sense for waste types of similar nature or of an associated nature to be handled at one facility for economic movement of final components and/or whole articles to other downstream recycling specialists thus keeping environmental and commercial costs to the public as low as possible.

It is therefore the intention for the installation to deploy its resources for the treatment and recycling of waste Lead-acid batteries, but also to accommodate the repackaging and consolidation of other batteries in relatively low quantities.

The current permit allows for a manual process where battery terminals are removed, electrolyte (battery acid) is drained from each battery following which the batteries are placed through a circular saw to remove the casing allowing the lead plates to be removed by hand. This process is labour intensive with significant exposure risks to the individual and the lead plates are still soaked in electrolyte causing it to pool in the bottom of the container which in turn can lead to unintentional release.

As with the previous permitted process at the installation, Lead-acid batteries will be accepted and inspected to ensure there is no contamination or other problems associated with the waste and will be stored within the site boundary in designated storage or holding areas in closed containers or the warehouse, so it is kept in a controlled and secure environment.

The new process for which the permit variation has been applied for is an automated process through which the entire battery is fed onto a conveyor belt into a hammer mill which breaks apart the battery and its components. The process is then designed to separate the various components (lead metal, lead oxide paste, plastic, PVC separators, electrolyte).

Separation techniques include:

* Trommel screen
* Separation baths
* Vibrating screens
* Filter presses

This process removes the manual process minimising the hazards to health and risk of injury to our workforce and the separated waste streams are cleaner and dryer therefore minimising the risk of unintentional release.

The remaining lead oxide paste can be ‘de-Sulphurised’ by chemical reactions using the Sodium Hydroxide producing a material which generate significantly less SOx during the pyrometallurgical stages at downstream operators.

Unexpected Waste

It is only the intention of HBR to purchase and recycle Lead Acid batteries. However, when inspecting loads after acceptance frequently other battery chemistries such as Li-ion and NiCad will be found mixed with the Lead-acid batteries; these shall be separated from Lead-acid batteries, or collected separately from Lead-acid batteries and sorted by category and chemistry, repackaged, and then sent to final recycling facilities in accordance with local and national regulation, and reporting of such activity shall be made to the Environment Agency for compliance with the Waste Battery & Accumulator Regulations

Record Keeping

The records for all waste inputs and outputs are retained at the installation and reported to the Regulator at quarterly periods.

A register of all waste inputs, and outputs and their recovery or disposal destination shall also be maintained as a summary of the activities and waste throughput, with perpetual stock records also being maintained as a result of day-to-day activities.

All our activities shall be carried out in a large warehouse building and subject to stringent controls and adherence to both National legislation, and local policies and procedures.