Permit Application

Minworth Battery Reuse and Recycling Facility
EPR/KP3396FQ/V006

Veolia ES (UK) Limited

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United Kingdom & Ireland

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Table of Contents

5. Application contact information 35

Included:

Appendix A – Site Plans and Drawings
Appendix B – EMS summary and Procedures (SOP Matrix)
Appendix C – Environmental Risk Assessment and H1
Appendix D – BAT Assessment
Appendix E – Site Condition Report
Appendix F – Technical Competence
Appendix G - Fire Prevention Plan

1. Non-technical summary

This non-technical summary supports the application to substantially vary the permit for the Minworth Battery Reuse and Recycling Facility (formerly known as Minworth Waste Management Centre), permit reference: EPR/KP3396FQ. It highlights the rationale for the development and the operations that will be carried out.

The site was originally permitted in 1995 (to Caird Environmental Limited) and operated as a hazardous waste treatment facility for the following:

- Physico-chemical treatment of acidic, alkaline and contaminated water wastes in liquid, sludgy and powder form including the pre-treatment of cyanide containing wastes by chemical oxidation
- Physico-chemical treatment of oily wastes/oil contaminated water wastes in order to separate the oil fraction for subsequent recovery
- The handling of packaged waste for the purpose of treatment on site or storage pending transfer to off site recovery, treatment or disposal.

The site was cleared of all waste and infrastructure and the permit was transferred to Veolia ES (UK) Limited (Veolia) in June 2006.

The hazardous waste treatment operation was not recommissioned by Veolia and so a variation (V002) was submitted to reduce input tonnes to <5,000 tonnes. The permit was issued in April 2010.

A further variation (V004) was made to the permit in April 2012. The purpose of this variation was to enable a battery sorting facility to be developed at the site for the storage, sorting, mechanical treatment and repackaging of batteries for onward recovery and disposal. This was in response to changing market conditions and corporate strategy development.

In August 2013 an Agency-initiated variation (V005) was issued to reflect the implementation of the Industrial Emissions Directive (IED).

The permit was originally amended as Veolia intended to install an alkaline and portable battery recycling facility. However, these were changed when Veolia divested its share in the BatteryBack Battery Compliance Scheme in 2016 and WasteCare developed an alkaline battery recycling facility in Halifax. The battery treatment operation, requested under V004, did not become operational and the site has been used as a non-waste operation for the last few years. Namely for Veolia's Re-Life Project which refurbishes waste containers for reuse.

As the sales of electric vehicles (EVs) continues to grow at a rapid pace supporting the Government's decarbonisation efforts, the Minworth site will now provide an Electric Vehicle

(EV) battery recycling facility in the centre of the UK and grow as this market develops over the next few years.

In 2022 Veolia sought to commence discussions with the Environment Agency (EA) to allow the storage and treatment of non-hazardous Li-ion electric car batteries. The treatment in question would consist of discharging the battery and dismantling it for the recovery of the component parts. The EA agreed to this under the current permit conditions, subject to the submission of a Fire Prevention Plan (FPP). The FPP was agreed in June 2022. This is referred to as Phase 1 of the development of Minworth.

Veolia is now seeking to further develop the battery operations with the installation of a shredder and associated air and water emission abatement equipment. This is the subject of this application to substantially vary the permit (V006). The shredding facility will allow the shredding of secondary lithium-ion (Li-ion) and primary lithium batteries so that they are rendered safe for transport prior to TFS shipment to Veolia's facility in Metz, France, for material separation and metal recovery. Only a small proportion of primary Li batteries will be processed, usually less than 5% of inputs. These will be discharged prior to shredding so that lithium metal is converted to a non reactive salt in the battery prior to shredding..

All types of Li-ion batteries will be shredded using the equipment, including batteries from vapes, mobile phones, laptops, power tools, e-scooters, ebikes through to EV modules. EV batteries will have residual electrical energy removed using bespoke equipment. Where this is not possible, batteries will be discharged in water (or sodium chloride) baths. Portable batteries will be shredded without prior discharging. This is Phase 2 of Minworth's development.

The future plan for the site is to undertake material separation. This will allow more materials to be recycled in the UK (e.g ferrous, aluminium and copper foils) with only black mass (a mixture of graphite and the metal salt containing cathode powder) being shipped to France for metal recovery.

The site is now known as Minworth Battery Reuse and Recycling Facility.

The Minworth Battery Reuse and Recycling Facility, 'the Facility' which will be operated by Veolia ES (UK) Limited, comprises the following elements:

- A refurbished building for the assessment, discharge and dismantling of industrial (EV) Li-ion batteries
- A shredding facility for military, portable, automotive and industrial batteries within the building, comprising:

  - A lifting tipper assembly to feed the material from ground level to the first shredder
  - 2 No. shredders and all the associated steelwork, air extraction system and water system
  - Dewatering screen
  - Screw conveyor
  - Bagging station with 2 filling positions and 4 extra draining positions.
  - A water filtration system to include a filter press, capable of filtering the shredder process water and the water drained from the shredded material.
  - Water treatment (pH adjustment) system.
  - Access platform adjacent to shredder to allow access for removal of blockages. The staircase to the shredder platform will include an interlocked gate.
  - Control Panel with Integrated control system for all equipment supplied
  - Storage area for the initial drying of the bagged shred material with an air extraction system
  - Process water storage tanks - there will be 3 tanks for effluent arising from the plant. This allows one to be filed, one to be tested and one to be discharged after satisfactory testing.

- 2 x 40ft shipping containers and bunded yard area for the storage of waste batteries that may be quarantined for any reason. The containers are fitted with an automated Stat-X potassium-based aerosol fire suppression system and a deluge system that is fed by a dry riser.
- Outside covered storage bays for the storage of incoming batteries and for the drying of the shred material.
- Quarantine Area.
- External covered storage bay housing discharging baths for non-EV batteries (e-bikes, scooters, hand tool batteries)
- Associated used and new packaging materials storage area.

Refer to site layout drawings ref: VES_TD_MINWORTH_100_002 (external) and VES_TD_MINWORTH_100_008 (internal building arrangements) in Appendix A.

The shredding facility will accept and process or transfer up to 15,000 tonnes per year of waste Li-ion and primary Li batteries by 2028. As mentioned above, primary Li batteries will be less than 5% of the input to the plant.

The facility has the primary purpose of serving regional transfer and national customers who require a service for the recycling of their batteries. Industrial and automotive batteries are prohibited from incineration or landfill by the Waste Batteries and Accumulator Regulations.

In normal operating circumstances batteries will be brought to site and subsequently assessed, discharged and dismantled or shredded. There will also be an option for transfer without any treatment, except for checking the condition of the batteries. This option is less favourable due to the increased carbon footprint of transport.

The facility is located off Forge Lane in Minworth, Sutton Coldfield. Access to the site is via a new tarmac roadway through the recently constructed Minworth Industrial Park, following the demolition of the previous neighbouring building.

The full address for the site is detailed below:

Veolia ES (UK) Limited
Minworth Battery Reuse and Recycling Facility
Forge Lane, Minworth Industrial Estate,
Sutton Coldfield,
West Midlands,
B76 1AH

The site is centred on National Grid Reference (NGR): SP 14846 92325.

Refer to drawing ref: VES_TD_MINWORTH_100_006 in Appendix A for the site location.

2. Application type

2.1. Background

This application relates to the expansion of the battery treatment Facility at Minworth from a discharging and dismantling operation to include a battery shredding operation.

The new shredding operation will improve safety as batteries will be shredded prior to transport to France. This will remove the fire risk as the shredded material is non combustible. This risk reduction will be especially important when physically or fire damaged batteries require recycling, as they have the highest risk of fire. These batteries will be able to be collected in the UK in specialist P911 containers, specifically designed for transporting critical batteries, but the containers will be able to remain in the UK.

The shredding operation is a precursor to the development of material separation capability at the Minworth site.

Basic pre-application advice was received via email, dated 19th June 2023, from the Environment Agency.

2.2. Summary of permit application type

This application is to substantially vary the existing permit (EPR/KP3396FQ/V005) with the following changes (new activities highlighted in **bold,** existing activities are not highlighted):

- AR1 - S5.3 A(1)(a)(iv) - Repackaging of hazardous waste - manual sorting and separation and bulking - treatment of <10t hazardous waste/day for the purposes of recovery.
- **AR2 - S5.3 A(1)(a)(ii) - Physico-Chemical treatment via pH adjustment (or any other chemical treatment) of 10t hazardous waste/day for disposal. pH adjustment of effluent arising from on site process prior to filter press (shredding AR8)**
- AR3 - S5.6 A(1)(a) - Temporary storage of >50t hazardous waste pending disposal or recovery.
- **AR4 - S5.3 A(1)(a)(ii) - Physico-Chemical treatment - sieving/separation for recovery of 10t hazardous materials/day generated from shredding lithium batteries (AR8)**

Directly Associated Activities:

- **AR5 - Raw materials handling and storage (chemicals).**

- **AR6 - Filtrate and filter cake storage**
- **AR7 - Discharge to foul sewer**
- AR8 - Shredding of lithium batteries prior to AR4.
- **AR9 - Discharging batteries prior to AR8**

Waste Activities:

- AR10 - Physico-Chemical Treatment of non-hazardous waste: inspection, testing, discharging, dismantling prior to AR8.
- AR11 - Storage of non-hazardous waste: lithium batteries.
- AR12 - Repackaging - manual sorting and separation and bulking of non-hazardous waste for the purposes of recovery.

Addition of several new EWC codes into Table S2.2 and S2.3 of the permit:

- 160121* - some Original Equipment Manufacturers (OEMs) use this for EV batteries if they want to classify as hazardous waste
- 160303* - manufacturing scraps - battery production scraps often coded as this and they may be suitable for the shredding plant.
- 200135* - Minworth site may receive WEEE containing batteries. These can be removed and recycled.
- 200136 - Minworth site may receive WEEE containing batteries. These can be removed and recycled.
- 160213* - Minworth site may receive WEEE containing batteries. These can be removed and recycled.
- 160214 - Minworth site may receive WEEE containing batteries. These can be removed and recycled.

The addition of several EWC codes to be shredded (AR8) other than 160604 and 200134 in Table S2.4 of the current permit:

- 160303* - battery production scraps,
- 160121* - only for EV Li-ion batteries,
- 160605 - this code is most frequently used for lithium batteries

3. Operating techniques

3.1. Proposed activities

Staff numbers will include four on-site staff, consisting of 2 Operators, 1 Business Manager, 1 Operations Manager.

The Facility is likely to operate for up to 10 hours per day, Monday to Friday, given the expected tonnages of batteries to be received. Weekend working is possible, but unlikely in the first few years of operation.

Battery handling operations will cease one hour before closing to allow temperature and other safety checks to be undertaken.

3.1.1 Waste Acceptance and Pre-acceptance

Batteries will normally be processed in the order delivered, unless batteries appear to need more immediate action e.g. damage, leaks or other signs of instability.

Any incorrectly declared battery deliveries will be quarantined immediately and dealt with in line with local procedures and guidance as detailed in the management system.

Pre-acceptance and waste acceptance procedures are in place for all batteries received at the site to ensure that incompatible or reactive wastes are not accepted at the Facility. In the event that a hot battery is detected during acceptance the primary option is to offload the battery to a quarantine container, although each incident will be event-specific and the site management/fire marshal shall be responsible for managing the situation. The fire service will be called if the battery temperature continues to rise and the incident is deemed as beyond the capabilities of the site staff and resources.

3.1.2 Waste Storage

Waste collected or delivered from businesses will be transported by curtain sided or covered vehicles of various types throughout the working day. Following acceptance checks (including temperature) and weighing, waste arriving at the site is stored either in the outside bunded covered storage bays (weatherproof packaging only) or in the Stat-X shipping containers.

Typical weatherproof storage containers are set out in Figure 1.

Figure 1 - Example of weatherproof battery containers

Incoming Li-ion and Li batteries will be stored in one of four covered bays or in one of two shipping containers. The concrete bays are fire resistant concrete with 2m of freeboard above the batteries and are also fitted with an automated water deluge system, fed by a fire water tank on site. The shipping containers are fitted with an automatic Stat-X fire suppression system and dry riser deluge system (see Figure 2).

Figure 2 - Stat-X container

Drawing ref: VES_TD_MINWORTH_100_003 in Appendix A sets out the concrete bay design.

Refer to site layout drawings VES_TD_MINWORTH_100_002 in Appendix A.

Batteries may be received in packages of varying shapes and sizes as well as materials such as cardboard, plastic, wood and metal. When applicable, pallets will be double stacked in the covered storage bays. There are 4 storage bays for incoming batteries (marked as 5, 6, 7, and 8 on drawing ref: VES_TD_MINWORTH_100_002 in Appendix A). They have a maximum capacity of 200m^3 of batteries, although this is unlikely to be achieved given the size of EV battery containers that will increase the void space in the storage area. These bays are 10m x 3m and are protected by an automated water deluge system in the event of fire.

Batteries that are being discharged in water baths will be stored in metal or plastic boxes of approximately 600 litre capacity. These will be stored in the covered bay between the building and the concrete bays for incoming batteries (marked as 9 on drawing ref: VES_TD_MINWORTH_100_002 in Appendix A). This bay measures 10.4m x 8m and boxes may be double stacked. This provides a maximum storage capacity of 100m^3.

Shredded material will initially be stored in the shredder building to dry, for up to 24 hours. It will then be moved in the same Flexible Intermediate Bulk Container (FIBC) bags to one of the 4 shredded material covered storage bays (marked as 1, 2, 3, and 4 on drawing ref: VES_TD_MINWORTH_100_002 in Appendix A) for further air drying. The four bays measure 12m x 10m each and bags may be double stacked. Storage times in these bays could be up to 30 days depending on ambient temperature. Each bay will hold approximately 200m^3 of non combustible shredded batteries. The floors of the bays fall towards the front of the bay where there is an aco drain connected to a small sump. This allows easy collection and removal of any water that may drain from the bags or contaminated rain water.

The proposed drainage layout is set out in drawing ref: VES_TD_MINWORTH_100_007 in Appendix A.

3.1.3 Waste Processing - Battery Discharging and Dismantling only

Industrial (EV) Li-ion and Li batteries will be discharged of the remaining electrical energy and dismantled into cell or module level. The level of dismantling will depend on the structure of the battery pack, modules, and cells (cylindrical, pouch or prismatic).

All recyclable materials associated with the battery pack, such as aluminium cases, copper, electronics and cardboard packaging will be segregated and stored prior to off site recovery.

Batteries may also leave the site as they arrived, with no further processing. This may be because the batteries have a design that does not lend itself to dismantling (e.g. Li-ion auto batteries), if discharge equipment is unavailable, or for commercial reasons (e.g. availability and efficiency of process in France).

The manual discharge equipment in use at Minworth for EV batteries has been supplied by Reckelberg Environmental Technologies, Germany. It consists of 4 No. discharge channels as listed below.

- 1000V max, 10kW discharge rate x 1
- 500V max, 3kW discharge rate x 3

The equipment does not use resistive discharge. Instead, electricity is consumed on the local network, or if demand on site is low, exported to the national grid. A G99 export agreement is in place with Western Power, similar to that which would be in place for exporting surplus electricity from a PV array.

The equipment has a built-in safety feature, a bender relay. This relay monitors that the grid is live and allows the discharge to occur. In the event that the local or national grid stops being live, the bender relay will turn off the equipment, preventing any discharge and export of electricity. This feature protects staff and infrastructure when isolation of the electricity supply is necessary.

Figure 3 below, shows the discharge equipment that will be used to discharge EV batteries safely.

Figure 3 - Manual discharge equipment for EV battery discharge

Figure 4 sets out the process flow for the discharging and dismantling only operation.

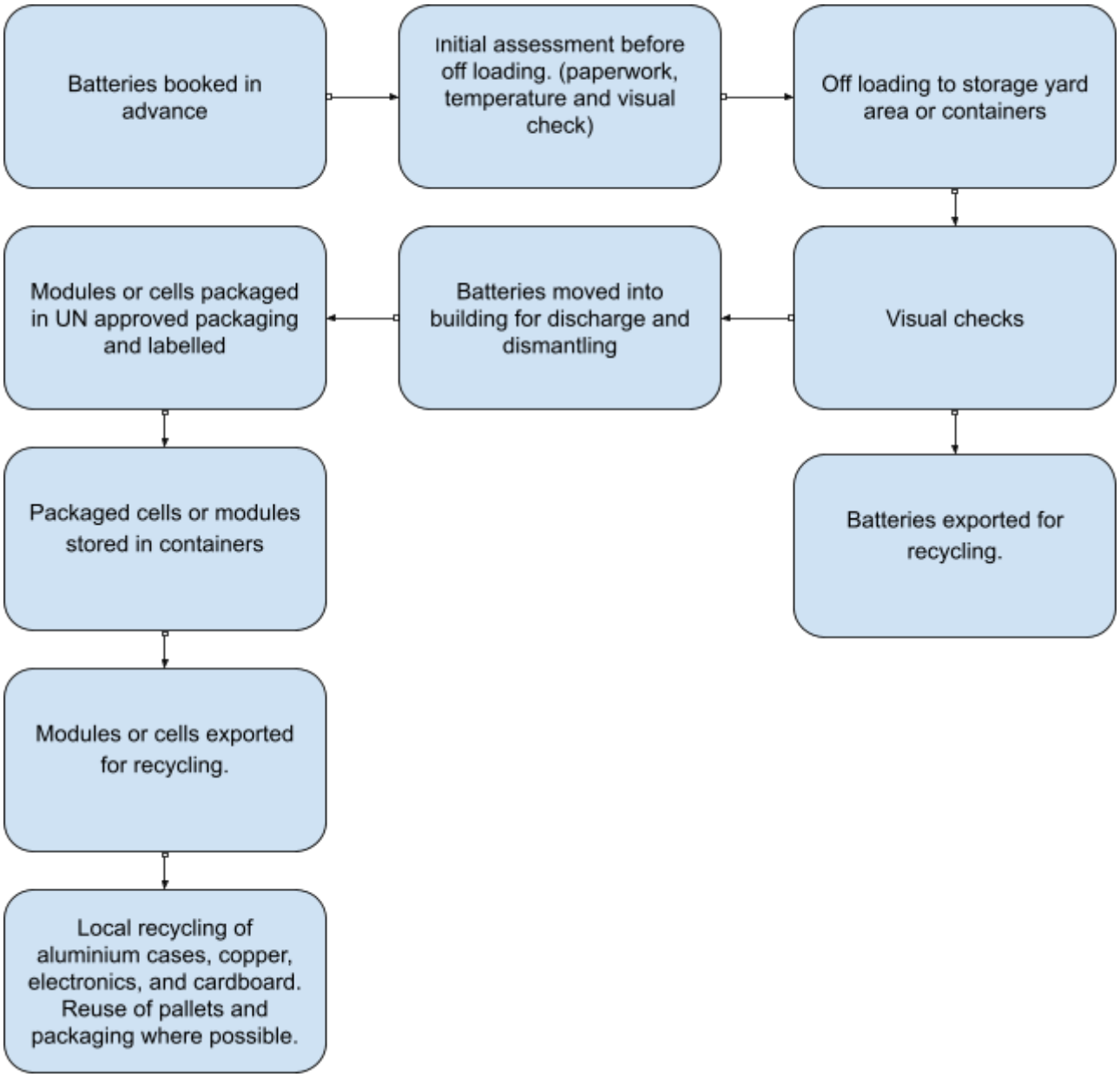

Figure 4 - Simplified process flow diagram for safe receipt, discharge and dismantling of processing of Industrial EV Li-ion batteries

3.1.4 Waste Processing - Battery Shredding

The battery shredding operation will be undertaken in accordance with the following general process:

- The incoming batteries will be stored in designated covered concrete bays.
- EV modules will be manually discharged using the equipment described in Section 3.1.3 and hand-tools batteries will be discharged in stillages filled with water or a Sodium Chloride (NaCl) solution for 1 to 7 days, depending on battery type. The stillages will be stored in a dedicated covered storage bay.
- The stillages will be transported with a fork lift truck (FLT) to a lifting tipper assembly (located within the main building) capable of lifting and tipping a total weight (stillage + material) of 750 kg.
- The discharged batteries will be tipped in shredder number 1, which will reduce the shred size to approximately 25mm.
- The shredded batteries from shredder number 1 will be discharged into shredder no 2, which will further reduce the size of the shred material to approximately 11mm.
- The shredded material from the shredders assembly will then be discharged on a dewatering screen. The dewatering screen will be designed to remove a large proportion of the water used during the shredding process, while draining the water into a designated collection tank.
- From the dewatering screen the shredded material will be transported by a screw conveyor to the bagging station where the material will be discharged into 1m^2 Intermediate Bulk Container (FIBC) bags. The bagging station will comprise 2 No. filling stations with forklift bag hangers, a pneumatically actuated changeover valve and 4 No. drain stations for the bags to be stored for up to 24 hours within the building. All bags will be placed on top of a collection pan/tank which will be connected to the main shredding water filtration system.
- The air extraction system will be operational over the initial drying area to remove any fugitive VOCs that may be emitted at this early stage.
- Following the initial drying period the bagged shred will be stored in the dedicated outside covered storage bays until sufficiently dry to be transferred off site. This could be up to 30 days, depending on ambient temperatures. The bays will have a dedicated drainage system to capture any runoff liquids.

The process is set out diagrammatically in Figure 5 below.

The proposed layout of the site is set out in a series of drawings in Appendix A. These are summarised as follows:

- External site layout - VES_TD_MINWORTH_100_002
- Concrete bay wall construction - VES_TD_MINWORTH_100_003
- Fire tank and pump room elevations - VES_TD_MINWORTH_100_004
- External treatment building elevations - VES_TD_MINWORTH_100_005
- Proposed site drainage - VES_TD_MINWORTH_100_007

- Proposed Internal layout of the treatment building - VES_TD_MINWORTH_100_008

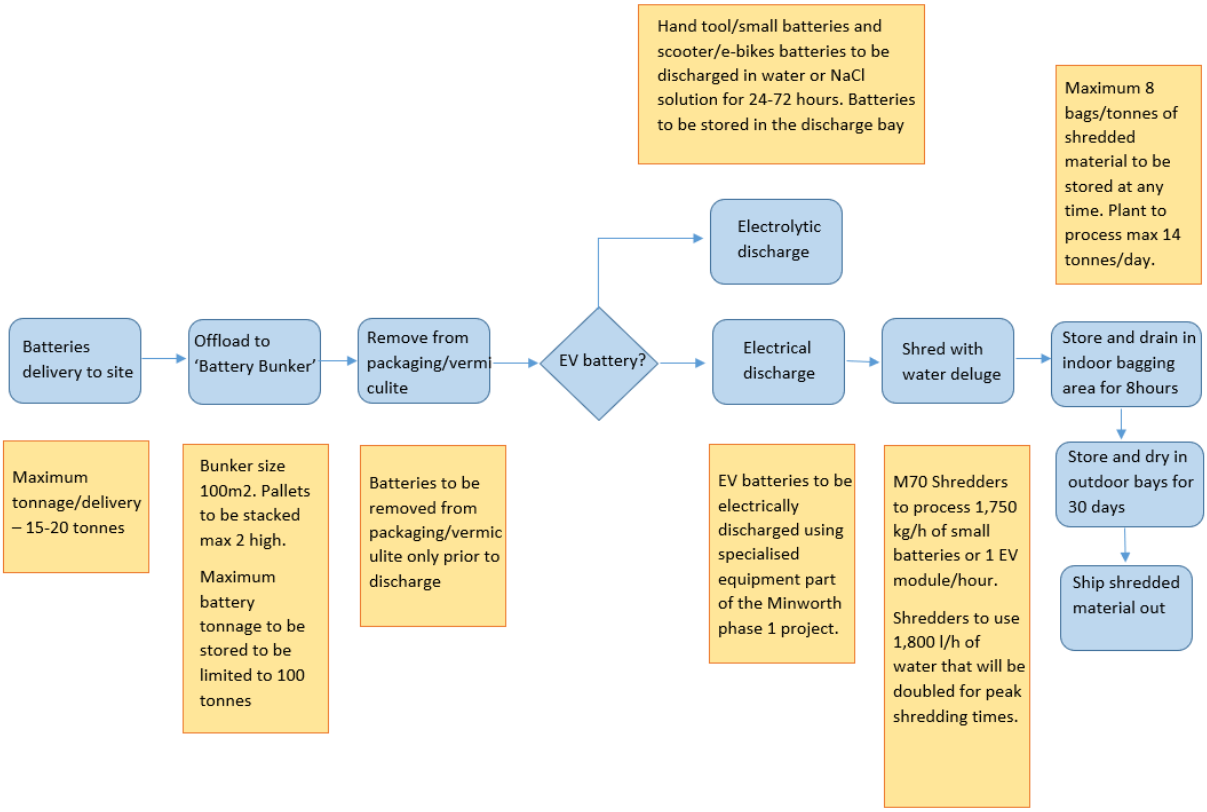

Figure 5 - Simplified process flow diagram for safe receipt, discharge and shredding of batteries

<u>Process Equipment</u>

- A lifting tipper assembly to feed the material from ground level to the first shredder
- 2 No. shredders and all the associated steelwork, air extraction system and water system
- Dewatering screen
- Screw conveyor
- Bagging station with 2 No. filling positions and 4 No. extra draining positions. All bags will have to be placed on top of a holding tank/pan connected to the water filtration system
- A water treatment and filtration system to include a filter press, capable of filtering the shredder process water and the water drained from the shredded material. pH adjustment of the filtrate to maintain a neutral pH.

- Access platform adjacent to shredder to allow access for removal of blockages. The staircase to the shredder platform must have an interlocked gate.
- Control Panel with Integrated control system for all equipment supplied
- Air extraction system

Lifting Tipper Details

- The Lifting Tipper assembly will be designed to accept steel stillages (the size and design to be confirmed), one at a time, and then lift and tip the battery contents into the hopper on Shredder 1.
- 0.75 Tonne capacity lift (i.e. up to 375 kg for the stillage and up to 375 kg payload of batteries or pro-rata).
- Stainless steel 'car' of sufficient size to hold one-off stillage. The 'car' will have a means of locating the stillage to prevent it from being tipped into the shredder hopper.
- Chain lift and hydraulic cylinder tip function. The hydraulic cylinder will be fitted with a device to prevent inadvertent dropping in the event of a hose /pipe failure.
- Normal hydraulic goods lift safety gear
- The tipping function position to be controlled by a linear potentiometer to allow the steady, controlled feed of batteries into the shredder hopper
- Hydraulic power unit with all valve gear, suction strainer, return line filter, filler / breather, high temperature switch, low oil level switch located on one side of the mast with interconnecting pipework
- The hydraulic power unit to be sited in a fully welded steel bund with a capacity of 110% of the oil reservoir and the hydraulic cylinders
- Local manual override controls for all functions to assist with troubleshooting and maintenance
- Variable speed control for both the lift and tip functions
- Full perimeter guarding using 1.8 m high weld mesh panels to provide good visibility at all times and with double interlocked access doors to allow a forklift to manoeuvre the stillages in and out
- Local electrical isolation and emergency stop button

Shredder 1 Details

- Heavy duty funnel hopper manufactured in stainless steel. The funnel hopper will be fitted with a large hood with small clearance to the tipping mechanism / stillage to contain liquid splashes and shredded particles from being ejected.
- The hopper hood will have an interlocked access door, a 250 mm flange / spigot for extraction, a waterproof LED strip light and waterproof CCTV camera

- Local HMI control panel for engineering level control, troubleshooting and maintenance
- Local electrical isolation and emergency stop button
- Heavy duty support frame with safe access platforms and stairs / ladders, combined with that for Shredder 2

Shredder 2 Details

- Heavy duty inter-connection hopper manufactured in stainless steel and fitted with an interlocked access door.
- Local HMI control panel for engineering level control, troubleshooting and maintenance
- Local electrical isolation and emergency stop button
- Heavy duty support frame with safe access platforms and stairs / ladders, combined with that for Shredder 1

Dewatering Screen Feeder Assembly

- The Dewatering Screen Feeder assembly is designed to remove a large percentage of the free liquid from the material discharged from the Shredder 1 and Shredder 2 assembly.
- Vertical chute bolted to the underside of Shredder 2 with an interlocked access door
- A free-standing, vibrating, trough screener mechanism will be fitted immediately below the chute
- The screener trough will be sufficiently wide and high sided trough to provide a 300 mm gap to all sides while static and with sides that are 450 mm above the discharge from the feed hopper / chute to allow for the stopping, oscillation and to reduce the chance of liquid discharge
- Free liquid collection tank with angled bottom and fitted with a belt style oil skimmer fitted to the main tank to remove lubrication oil for potential recycling
- Local electrical isolation and emergency stop button

Screw Conveyor Assembly

- The screw conveyor assembly is designed to move material between the Dewatering Screen assembly and the FIBC filling station.
- One infeed and one discharge
- Conveyor to be set at an angle of 30-degrees to provide a discharge height of approximately 4,400 mm on fully welded and braced supports

- Local electrical isolation and emergency stop button
- D-ring ladder to a small safe access platform adjacent to the drive

Filling Station

- The FIBC Filling Station will be sized for two bulk FIBC bags and a double chute feed so that changeover can be easily made as the duty fill bag level is reached.
- Designed for 1.0m^3 FIBC's
- 2 No. filling stations, each with forklift bag hangers
- One pneumatically actuated changeover valve
- 3 No. further drain stations and a further station for settlement sludge with forklift bag hangers with 6 No. FIBC's to be hung on a heavy-duty steel framework
- 6 No. FIBC's to be sited above a tank to collect the liquid run-off with the top having easily removable, open tread flooring sections and bracing to suit the loads imposed and the front protected by a separate, floor mounted and through bolted barrier to prevent forklift truck damage
- The tank to have gently sloping base with two-off, 50 DN port at the bottom but above each other and a too-high level float switch to act as a warning / shut-down device

Air Extraction system

- The extraction system will include the following;
    - Coarse filter
    - Wet scrubber with pump
    - Activated carbon pack with replaceable elements
    - Extraction fan
    - Alkali dosing system
    - Ducting
    - Exhaust stack running on the outside of the building to 1 m above the roof level
- The extraction / abatement system will be interlocked with the rest of the plant to prevent inadvertent operation
- Local electrical isolation

Water Filtration System

- A ring of 6 No. nozzles will be positioned in the Shredder 1 hopper to provide a flow of water through Shredder 1 and Shredder 2
- The water flow will be interlocked to ensure that batteries are not fed into the Shredder 1 hopper until such time that the water flow has been switched on for 10 seconds and

the water flow must continue for 30 seconds after shredding has been completed (both timers are to be adjustable and the will be set during commissioning)

- An average flow of water amounting to a total of at least 30 litres per minute or 1,800 litres per hour is thought to be a reasonable amount at this stage but this will need to be considered further during development of the project
- It will be possible to run the water at higher flow levels during the peak of feeding batteries into the hopper and link that to the load on the shredder so that 3,600 litres per hour can be delivered when the shredding loads are high and the control system will reduce that, after a predetermined delay, to approximately 450 litres per hour when no shredding is taking place
- Collection of liquids from the tank under the dewatering screen. These will be pumping to a hydra-cyclone and fed to a settlement tank fitted with a short screw conveyor to feed one of the FIBC stations as previously mentioned
- Collection of liquids from the FIBC Filling Station via a coarse mesh filter and delivery back to the shredder nozzles
- Collection of sludges from the FIBC Filling Station via a very coarse mesh filter and delivery to the settlement tank
- Overflow from any tanks will go to sealed site drainage network.
- Local electrical isolation
- Associated equipment including - Buffer tank, sludge pumps, filter press, steelwork and 1.8 m high weld mesh fencing with interlocked gate to drop the cake into an FIBC or forklift container, safe access platform, pipework, valves, controls.

<u>Water Treatment System</u>

- This is essentially pH adjustment to ensure that metal salts precipitate out of solution so they can be filtered out via the filter press. Flocculents may also be used to support this process if they improve the efficiency of solid/liquid separation.
- The water used as part of the shredding process will become lightly contaminated with hydrofluoric acid (HF) due to the lithium hexafluorophosphate in the electrolyte. The HF will lower the pH of the shredding water which will lead to increased corrosion. Therefore, the shredding water will be automatically dosed with 10% sodium hydroxide solution to maintain a neutral pH between 7 and 8. The pH will be maintained below pH 9 at all times to prevent reaction of the slightly caustic solution with the aluminium foils arising from the cathode.
- Treated effluent will be collected in one of three collection tanks. This will allow the effluent to be tested prior to discharge to sewer or off site disposal.

The shredding process is summarised in Figure 6. Air flows are represented as red hatched lines and water flows as blue (untreated filtrate) and green (treated effluent) lines on the diagram.

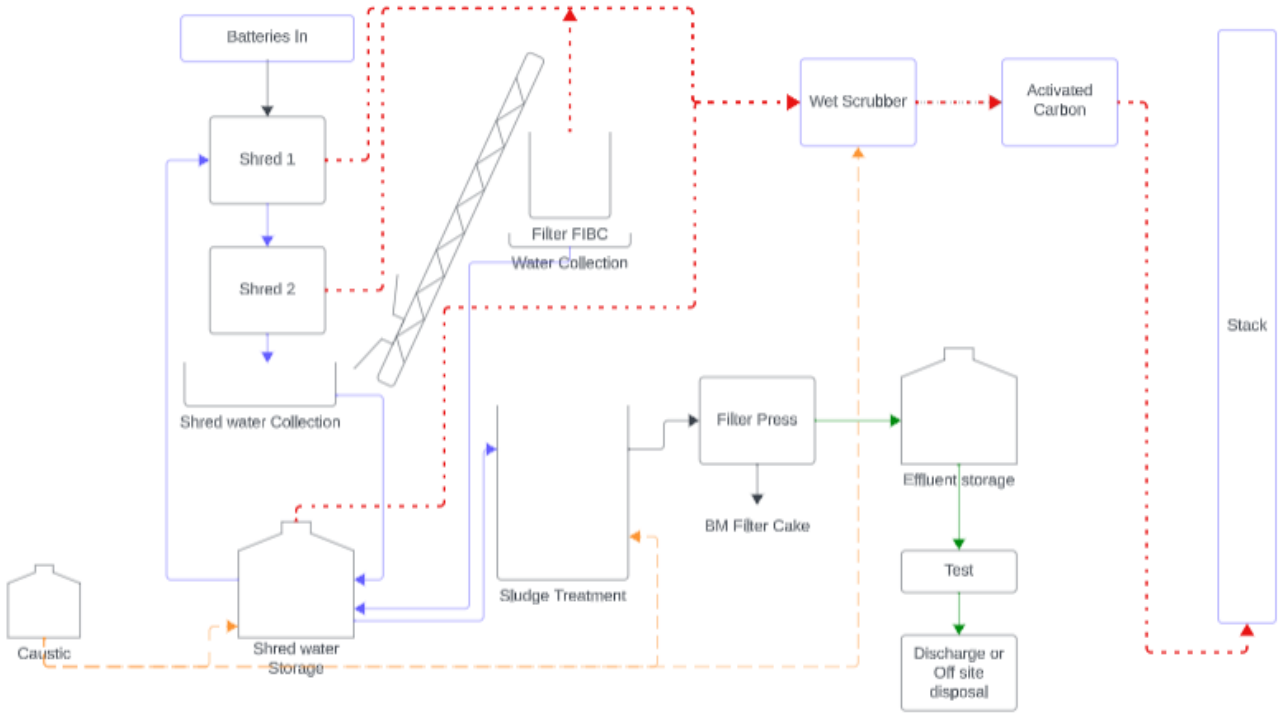

Figure 6 - detailed process flow diagram for the shredding process

3.1.5 Site Security

Site is fenced around the perimeter with a lockable gate. Access will be gained via a barrier and intercom system and a further swipe card system for entry to the main treatment building. The site will have remote CCTV monitoring as with other Veolia sites.

3.2. Waste types

The types of waste to be received at the site are set out in Tables S2.2, S2.3 and S2.4 of the current permit (V005). These cover a variety of non-hazardous (alkaline, Li-ion and Li) and

hazardous (Lead, Ni-Cd and Mercury containing) military, portable, automotive and industrial batteries.

In addition to these wastes several new EWC codes are being requested as part of this permit variation application, namely:

- 160121* - some Original Equipment Manufacturers (OEMs) use this for EV batteries if they want to classify as hazardous waste
- 160303* - manufacturing scraps - battery production scraps often coded as this and they may be suitable for the shredding plant.
- 200135* - Minworth site may receive WEEE containing batteries. These can be removed and recycled.
- 200136 - Minworth site may receive WEEE containing batteries. These can be removed and recycled.
- 160213* - Minworth site may receive WEEE containing batteries. These can be removed and recycled.
- 160214 - Minworth site may receive WEEE containing batteries. These can be removed and recycled.

Also, several EWC codes are requested to be added to the shredding Activity (AR8) other than 160604 and 200134 in Table S2.4 of the current permit. These are:

- 160303* - battery production scraps,
- 160121* - only for EV Li-ion batteries,
- 160605 - this code is most frequently used for lithium batteries

3.3. Management system

The Veolia Management System is registered and approved to standards ISO 9001, ISO 45001 and ISO 14001. The operational, monitoring and management procedures implemented at the proposed facility, are in accordance with the Veolia Management System and have been audited against the requirements of the standards detailed previously.

The proposed operation will be covered by group level and local procedures which form part of the Company's documented management system. A summary of Veolia's Business Management System is provided in Appendix B.

Local procedures will reflect the requirements of the Agency's Chemical Waste Appropriate Measures and Treating Metal Waste in Shredders Appropriate Measures, as well as HSE

guidance on Chemical Warehousing and Storage of Flammable Liquids. These will be under regular review and updated as required.

An overview of the procedures for a similar Veolia site are presented in Appendix B.

Adherence to the management system will ensure that regular training, monitoring and preventative maintenance are carried out at the facility, along with promoting an ethos of continuous improvement to site operations.

The site will be under the control of a Technically Competent Manager who holds the appropriate qualifications. The TCM will ensure that their site attendance will comply with Environment Agency requirements.

3.4. Waste tracking

Waste pre-acceptance, acceptance, handling and storage procedures are in place for Veolia's existing hazardous waste transfer operations. These will be used for the new battery treatment facility at Minworth.

Veolia uses a computerised waste tracking system to update information about the available capacity, quarantine, reception, general storage areas of a given facility. This is known as HAZMAT.

Veolia also uses Salesforce, which is a complete waste information management system designed specifically for waste treatment, storage, disposal and recycling facilities linking sales, waste approval, transportation, treatment, and disposal activities. The proposed new operation will be integrated into this existing system.

3.5. Operational hours

The proposed core hours of operation will typically be expected to be 0800 to 1800 with occasional loads in or out outside of these hours by special arrangement.

3.6. ABTO and ABE

Minworth Battery Reuse and Recycling Facility is an Approved Battery Treatment Operator (ABTO) and an Approved Battery Exporter (ABE) for portable, industrial and automotive batteries for 2023. It is planned that the site will continue to register as an ABTO. The plant is designed to meet the current recycling efficiency requirements in the Waste batteries

Regulations. It will also meet the requirements of the new EU Waste Batteries Regulation as the shred will be processed by the Veolia facility in France.

4. Environmental risk assessment

A qualitative environmental risk assessment 'ERA' for the operation has been produced to consider the risks associated with the battery treatment operation. The ERA includes a habitat assessment and is provided in Appendix C.

4.1. Technical standards

Activities at the Minworth Battery Reuse and Recycling Facility will be covered by corporate and local procedures which form part of the Company's documented management system.

Local procedures for this new facility will reflect amongst other things the requirements of the Waste Treatment BREF and Appropriate Measures guidance:

- Best Available Techniques (BAT) Reference Document for Waste Treatment
- Treating metal waste in shredders: appropriate measures for permitted facilities
- Appropriate measures for permitted facilities that take Chemical Waste (for storage of the hazardous shred material only)
- Relevant HSE guidance documents: HSG51 and HSG71.
- Relevant statutory instruments and related or supported technical guidance

A review of the BAT requirements of the Waste Treatment BREF and the Appropriate Measures are set out in Appendix D.

4.2. Avoidance of waste production from the activity

The facility will generate limited waste. Waste packaging such as pallets and packages will be recycled where possible.

Waste water from the shredding plant will be reused where possible.

Battery shred will be exported to Veolia's facility in Metz, France, operated by Euro Dieuze Industrie. At this site, the material is crushed into smaller pieces to release graphite and cathode salts from the anode and cathode foils (aluminium and copper). A separation process is then undertaken to create the following streams:

- Ferrous metal - recycled
- Aluminium foil - recycled

- Copper foil - recycled
- Black mass - graphite and cathode salts containing Li and other heavy metals (Co, Ni, Mn)
- Plastic fraction for incineration

The black mass is then transported to Veolia's facility Cedilor, also in France. At this site, a hydrometallurgical process is used to recover cobalt sulphate, copper sulphate, manganese sulphate, nickel sulphate and lithium carbonate.

Black mass filter cake from the filter press will be collected in open top drums or FIBCs. It will be sent for recovery to Veolia's facility in France.

4.3. Technical competence

Certificates of Technical Competence (awarded by WAMITAB) are set out in Appendix F.

The COTC holders for the Minworth Battery Reuse and Recycling Facility is set out in Table 1 below:

Name	Type	Date	Certificate no.	DoB
Ranjit Sira	TSH, TMH	Original Awards - 08/07/08, 02/04/08 Continued Competence - 14/2/22	09881, 09629 5193376	21/01/80
Karamjit Bhurjee	TMH	Original Award - 15/02/16 Continued Competence - 17/2/22	13962 5193065	23/07/79

Table 1 - COTC holders for the Minworth Battery Reuse and Recycling Facility

4.4. BAT assessment

BAT assessments have been carried out as part of this application (see Appendix D).

4.5. Habitats Assessment

Habitats are considered as part of the Environmental Risk Assessment, set out in Appendix C.

A Nature and Heritage Conservation screening report was undertaken as part of the basic pre-application request. This highlighted a number of Nature and Heritage Conservation sites within the screening distances, namely:

Plantsbrook Reservoirs - Local Nature Reserve within 2km

4 No. Ancient Woodland sites within 2km

12 No. Local Wildlife Sites within 2km

A copy of the screening report is included with Form C2 as part of this application.

The facility is located in a predominantly industrial / commercial area within the wider Minworth Trade Park. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west.

It is envisaged that due to the nature of the operation and the site setting, the potential for impact on the designated sites in the area will be insignificant.

4.6. Emissions to air

There will be a point source emission to air from the shredding plant.

H1 Assessment

A H1 assessment has been carried out which characterises and evaluates potential emissions to air from the battery recycling process. Source emissions data have been scaled from experimental work carried using small scale laboratory shredders based on information identified in a literature review. In the case of long term emissions these screen out as ‘not significant’ using the conservative assumption that all emissions are equivalent in risk to benzene. Short term emissions did not screen out assuming all emissions were benzene and in the absence of air quality assessment criteria for subject electrolyte compounds proxy data have been used alongside conservative safety margins. When further evaluated short term emissions are determined to be ‘not significant’. A conservative abatement efficiency has been assumed ensuring that the assessment is sufficiently protective of human health. Validation monitoring will be undertaken during and following commissioning and the H1 assessment will then be reviewed.

A copy of the H1 Assessment is set out in Appendix C.

4.7. Emissions to sewer

The pollution prevention measures that are to be implemented at the Minworth Battery Reuse and Recycling Facility are set out below. They fall into two main categories, those relating to hardware designed to prevent the escape of potentially polluting substances to ground, groundwater or surface water, and those relating to operating techniques and operator competence. These measures will apply to the new infrastructure.

Primary containment

Batteries are inspected on receipt and periodically whilst held in storage to ensure that the packages are not leaking or damaged to the extent that their integrity could be compromised.

All waste will be held under cover, either in the covered waste storage bays, within the main building or in the covered shred drying bays.

Secondary Containment

The bays will be constructed from materials which are resistant to the substances with which they may come into contact (typically reinforced concrete).

The floors of the drying bays fall towards the front of the bay where there is an aco drain connected to a small sump. This allows easy collection and removal of any water that may drain from the bags or contaminated rain water. These sumps can be pumped to IBCs or equivalent for transfer off site to suitably licensed facilities for disposal.

Tertiary containment

The site will occupy approximately 6,400m^2. The site is entirely surfaced with concrete. The indicative drainage arrangements are set out on Drawing ref: VES_TD_MINWORTH_100_007 in Appendix A.

The drainage philosophy is as follows:

The entire site is covered in impermeable paving, with a perimeter containment kerbs and ramps formed at the vehicle entrances to provide a fully bunded site.

The treatment building will contain all process water from the shredding operation within the dewatering screen and bagging stations. This process water will be treated in the on-site effluent treatment plant and discharged to sewer under a new Trade Effluent Consent or tankered off site for disposal.

The external drying bays will have drainage to capture any residual liquids. These sumps will

be manually pumped out to the on site effluent treatment plant or tankered off site for disposal.

Discharge from the remaining yard areas will be directed to a sewer (existing discharge point S1). The system can be isolated in the event of a significant spillage or fire.

During the initial phase of plant operation process effluent will be collected on site and designated for off site disposal to a suitably authorised facility. This will enable a compressed period of monitoring to be undertaken in order to characterise future sewer emissions and as a precursor to commissioning of the proposed effluent treatment plant. The effluent treatment plant will comprise pH adjustment, flocculation, settlement and filtration. It is proposed that further to a series of compressed monitoring that emissions to sewer will be evaluated in accordance with the Environment Agency H1 assessment criteria and emission limits can then be included into the site authorisation as appropriate.

4.8. Emissions to surface water and groundwater

There will be no emissions to surface water or groundwater resulting from this new operation.

4.9. Emissions to land

There will be no emissions to land resulting from this new operation.

4.10. Noise

Noise is considered as part of the Environmental Risk Assessment, set out in Appendix C. Impacts for noise are unlikely given the site setting and the type of operation.

The equipment will be located inside a building.

All plant will be maintained in accordance with the manufacturer's recommendations and will be subject to regular servicing in order to minimise noise.

The site is located on an industrial estate surrounded by other industrial activities. The closest residential areas are approximately 170m to the north and 210m to the south west.

Treatment activities will be restricted to the working day and will not take place overnight. Waste treatment takes place inside a building, which will provide a degree of noise attenuation.

If noise at the site is perceived to be an issue, a noise management plan will be produced and agreed with the local Environment Agency office, but it is not envisaged that this is required at this stage as the site is within an industrial area.

4.11. Odour

It is predicted that there will be Low odour risk resulting from this new development. Odour is considered as part of the Environmental Risk Assessment, set out in Appendix C. Impacts of odour are unlikely given the site setting, the type of operation and the materials stored/handled.

Wastes accepted at the site have a low odour potential and are not expected to cause any issues during receipt and storage. Site staff will remain alert to potential odour problems during the working day.

In the event that an odour problem is identified, or a complaint received, the Operations Manager will be informed, and investigations will be undertaken in order to identify the source of the odour and provide any necessary mitigation.

4.12. Site Condition Report

The Site Condition Report is set out in Appendix E.

The Application SCR is intended to describe the condition of the land and groundwater at the point of an application for an environmental permit is made by the operator. The Application SCR must consider the existing condition of the site through consideration of the former land-uses and pollution history of the site.

The SCR is intended to enable Veolia to demonstrate that reasonable steps to protect the land and groundwater from contamination have been undertaken during the lifetime of the Installation. The SCR is intended to be a ‘live’ document which is maintained throughout the lifetime of the operations at the Installation, from permit application through operation to permit surrender.

The Application SCR has been undertaken in general accordance with Environment Agency, Guidance for Applications, H5: Site Conditions Reports (v3, April 2013). In accordance with H5 guidance Sections 1 to 3 have been completed for the permit application stage. Veolia is required to maintain Sections 4 to 7 during the lifetime of the Installation. Sections 8 to 10 are required to be completed as part of an application to surrender the Environmental Permit.

4.13. Flood Risk Assessment

The site is located within Flood Zone 1. An initial assessment using the *Flood map for planning tool* on the .GOV.UK website concluded;

Land within flood zone 1 has a low probability of flooding from rivers and the sea.

Most developments that are less than 1 hectare (ha) in flood zone 1 do not need a flood risk assessment (FRA) as part of the planning application. The site you have drawn is 0.64 ha.

Reference to the .GOV.UK website for long term flood risk shows most of the site at Low Risk, with a small area of Medium Risk in the area of the surface water discharge sump. To mitigate this risk, all sensitive equipment will be raised from floor level.

As part of proactive measures to prepare for adverse weather due to climate change, a climate change adaption risk assessment is currently being undertaken, addressing areas such as:

- Summer daily maximum temperature
- Winter daily maximum temperature
- daily extreme rainfall
- Average winter rainfall
- Storms

4.14. Monitoring and measurement

The Veolia Management System includes procedures for inspecting the site and its perimeter on a daily basis.

Site inspections will include the condition of site infrastructure, including impermeable surfacing, tanks, pipework and secondary containment infrastructure.

Should any issues be noted these will be raised with site management and appropriate remedial action will be agreed. Details of the inspection and any remedial action will be recorded in the site diary.

The site diary will be made available to warranted officers of the Environment Agency on

request.

Should any incident have the potential to cause significant emissions, the Environment Agency will be informed by telephone and remedial action will be agreed with the local environment officer.

Records will be kept on site, in either electronic or hard copy format, recording:

- pre-acceptance details for each waste stream;
- waste transfer notes or consignment notes for incoming and outgoing wastes;
- details of any rejected loads and any associated remedial action taken;
- details of plant and infrastructure inspections, including any maintenance that is required; and
- details of any complaints received and the action taken to resolve them. 8.7 Records will allow for tracking of wastes, showing when and how they were treated and their eventual fate.

Monitoring of the sewer discharge will be undertaken, when required, in order to determine compliance with the Trade Effluent Consent.

Shredder scrubber emissions - the activated carbon unit will be fitted with continual IR gas monitoring equipment to highlight if breakthrough occurs

Effluent Treatment Plant fugitive emissions - no emissions are expected from the effluent treatment plant. This will be confirmed during commissioning and then by annual monitoring

Dust emissions - dust is not expected to be produced due to the wet nature of the process. During commissioning of the plant, dust monitoring will be undertaken to confirm this to be the case. dust monitoring will then be undertaken at a less frequent basis unless there are significant plant changes made.

4.15. Energy efficiency

We anticipate electricity usage to be approximately 1,500 kW/day.

2 No. electric Fork-Lift Trucks (FLTs) will be used at the site.

Energy usage will be monitored and reported in accordance with permit requirements. Energy usage shall be reviewed and any energy saving measures will be documented.

4.16. Raw Material Usage

It is expected that the maximum water use for the shredding process will be 1.8 tonnes of water per tonne of batteries that are processed. The actual figure is likely to be half of this as:

- water will be reused
- discharged batteries will require less water
- some types of battery, eg portable, will require less water use

In terms of raw materials used, Sodium hydroxide solution (10%) will be used to control the pH in the shredding water and effluent treatment plant. It is estimated that 1 tonne of solution will be required for 200 tonnes of processed batteries.

Raw materials usage will be monitored and reported in accordance with permit requirements. Usage shall be reviewed and any raw materials saving measures will be documented.

4.17. Fire Prevention

A copy of the Fire Prevention Plan (FPP) is set out in Appendix G. At the time of writing, the necessary surveys to determine the fire water containment capacity of the site have not been done. The Site Plan also requires some modifications to update it.

Once this information is available the FPP will be updated accordingly. This will be done before permit determination.

5. Application contact information

Main contact:

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Killamarsh
Sheffield
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andrew.nash@veolia.com

Alternative contact:

David Reynolds
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Minworth Battery Reuse and Recycling Facility
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Sutton Coldfield,
West Midlands,
B76 1AH
david.reynolds@veolia.com

APPENDIX A

SITE PLANS

Revision -

Drawing No. VES_TD_MINWORTH_100_002

1:250

0 5 10 20 50

PLANNING

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EXISTING SITE LAYOUT

KEY

PERMITTED BOUNDARY

BAYS 1-4 - SHREDDED MATERIAL STORAGE

BAYS 5-8 - INPUT BATTERIES & QUARANTINE

BAY 9 - DISCHARGING BAY STORAGE

Rev	Description of revision	Drawn	Chkd	App	Date

VEOLIA

Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
Tel: 0207 812 5185

Project

FORGE LANE
MINWORTH
SUTTON COLDFIELD B76 1AH

Title

PROPOSED
SITE LAYOUT

	Initials	Date	Scale	Sheet size
Drawn	RB	31.07.23	1:250	A1
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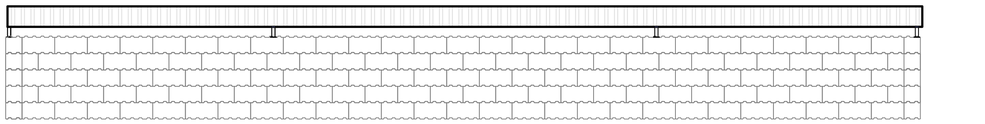
Job No. MINWORTH

Drawing No. VES_TD_MINWORTH_100_002

Revision -

Revision -

Drawing No. VES_TD_MINWORTH_100_003



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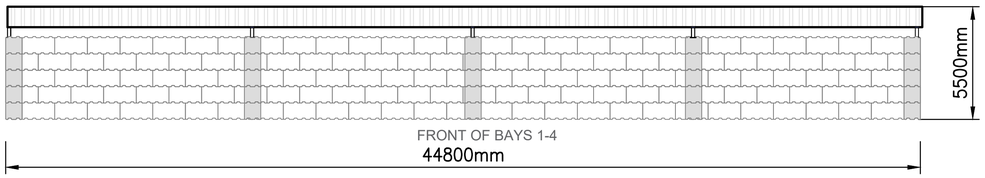

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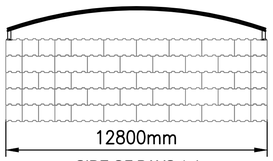

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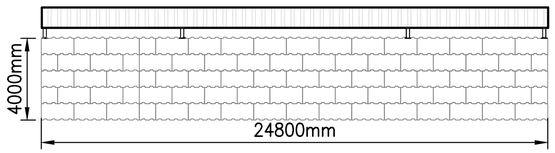

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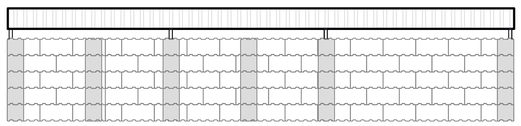

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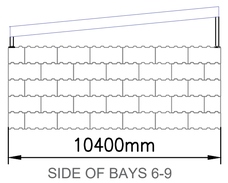

SIDE OF BAYS 6-9

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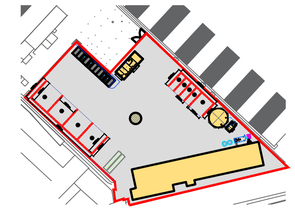
SITE LAYOUT PLAN



Rev	Description of revision	Drawn	Chkd	App	Date

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Technical Direction,
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Project

FORGE LANE
MINWORTH
SUTTON COLDFIELD B76 1AH

Title

COVERED BAY
ELEVATIONS

	Initials	Date	Scale	Sheet size
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Job No. MINWORTH

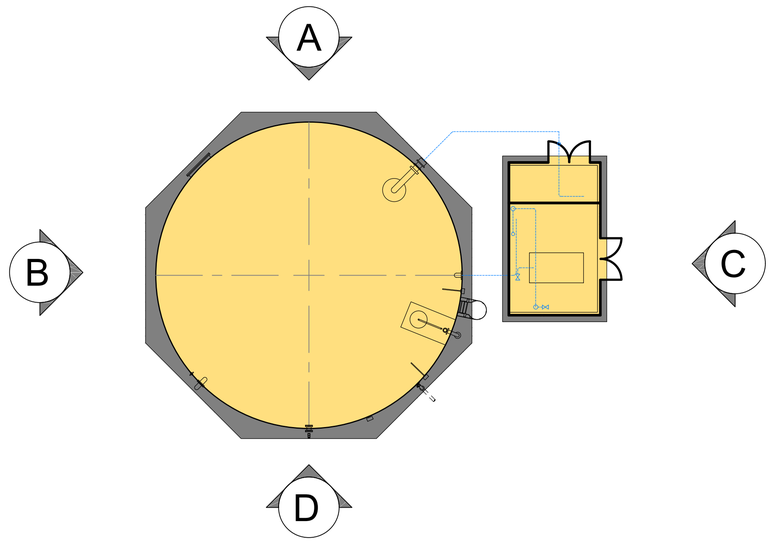
Drawing No. VES_TD_MINWORTH_100_003

Revision -

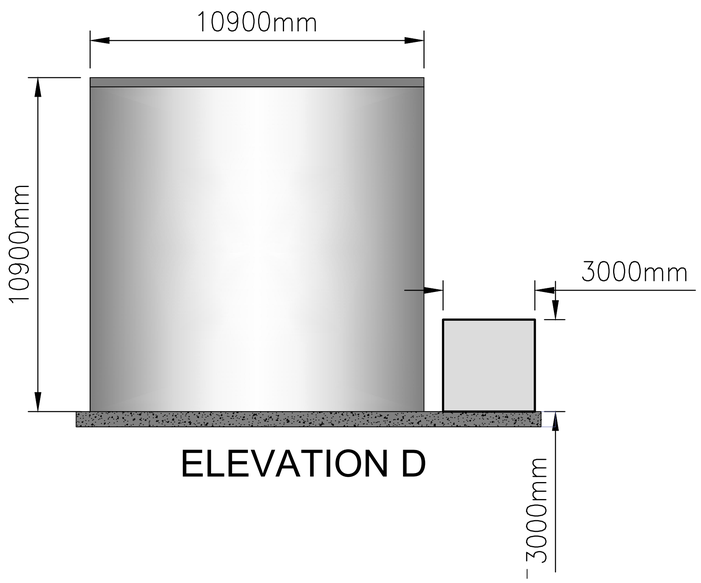
PLANNING

Drawing No. VES_TD_MINWORTH_100_004

Revision -



GROUND FLOOR PLAN



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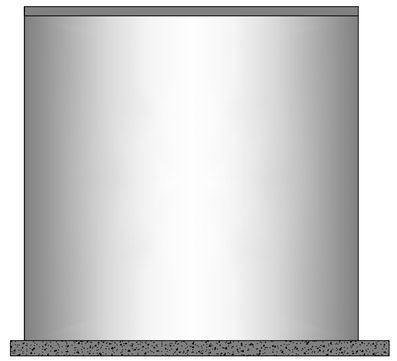

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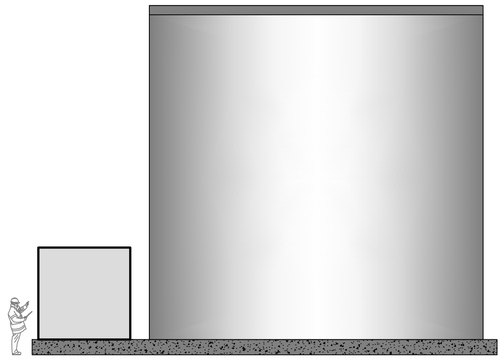

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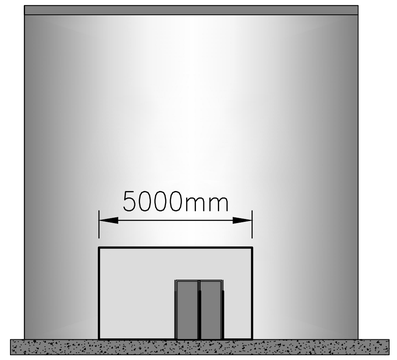

ELEVATION C

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FIRE TANK & PUMP ROOM
ELEVATIONS

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Job No. MINWORTH

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Revision -

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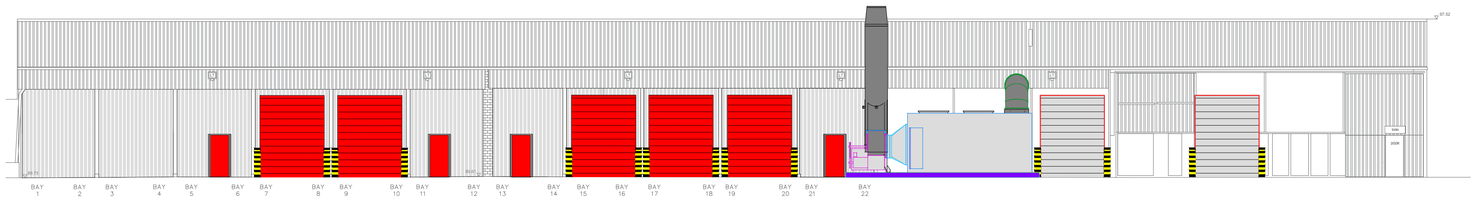

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SITE LOCATION

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BUILDING & AIR FILTER ELEVATIONS

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Job No. MINWORTH

Drawing No. VES_TD_MINWORTH_100_005

Revision -

Revision -

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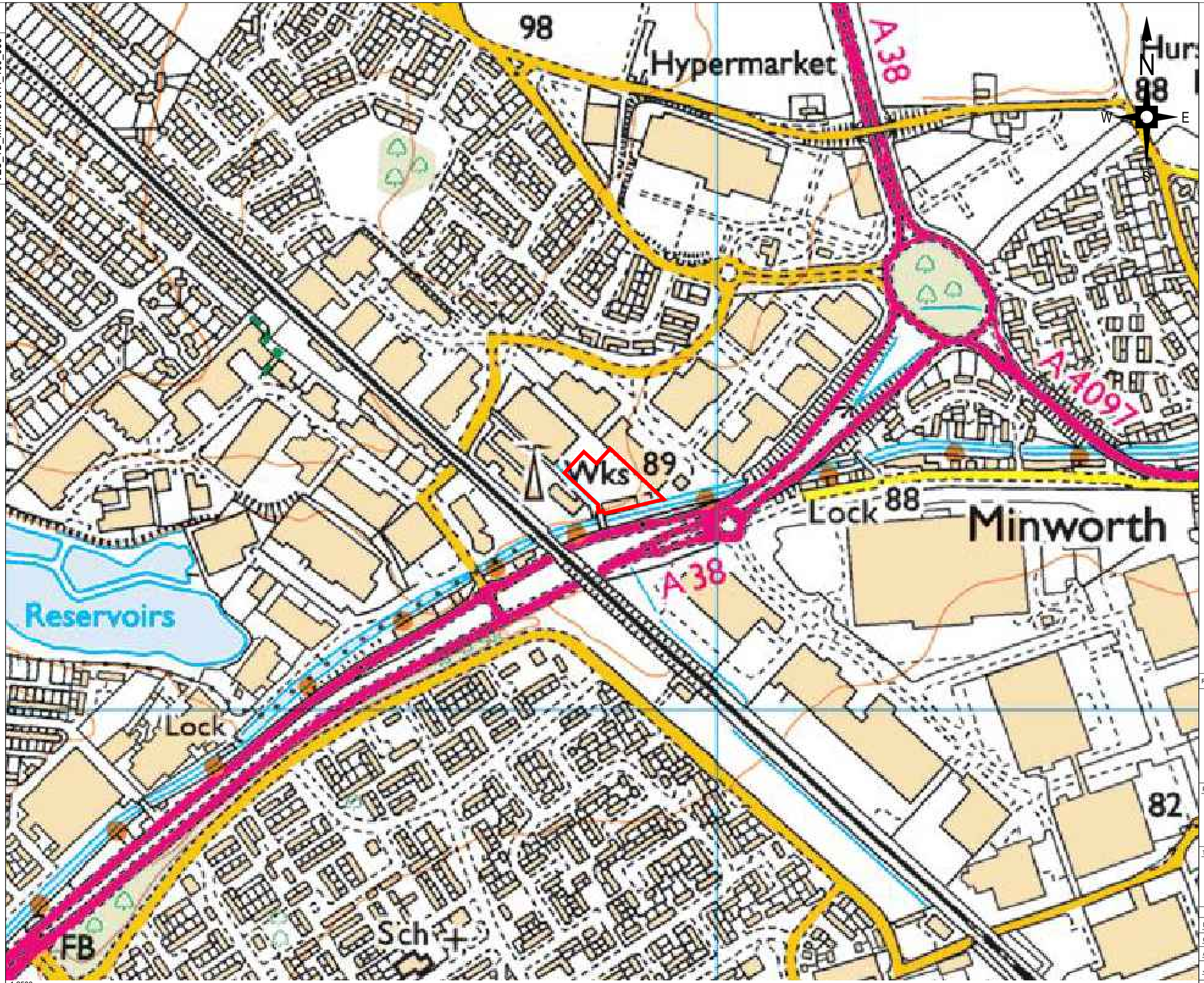

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SITE BOUNDARY

Rev	Description of revision	Drawn	Chkd	App	Date

VEOLIA

Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
Tel: 0207 812 5185

Project

FORGE LANE
MINWORTH
SUTTON COLDFIELD B76 1AH

Title

SITE LOCATION PLAN

	Initials	Date	Scale	Sheet size
Drawn	RB	31.07.23	1:2500	A1
Checked				
Approved			© Copyright Reserved	

Job No. MINWORTH

Drawing No. VES_TD_MINWORTH_100_006

Revision -

Drawing No. VES_TD_MINWORTH_100_007

Revision -

1:250

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PLANNING

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EXISTING FOUL

EXISTING DRAIN

PROPOSED FOUL

PROPOSED DRAIN

Rev	Description of revision	Drawn	Chkd	App	Date

VEOLIA

Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
Tel: 0207 812 5185

Project

FORGE LANE
MINWORTH
SUTTON COLDFIELD B76 1AH

Title

PROPOSED
SITE DRAINAGE PLAN

	Initials	Date	Scale	Sheet size
Drawn	RB	11.08.23	1:250	A1
Checked				
Approved				

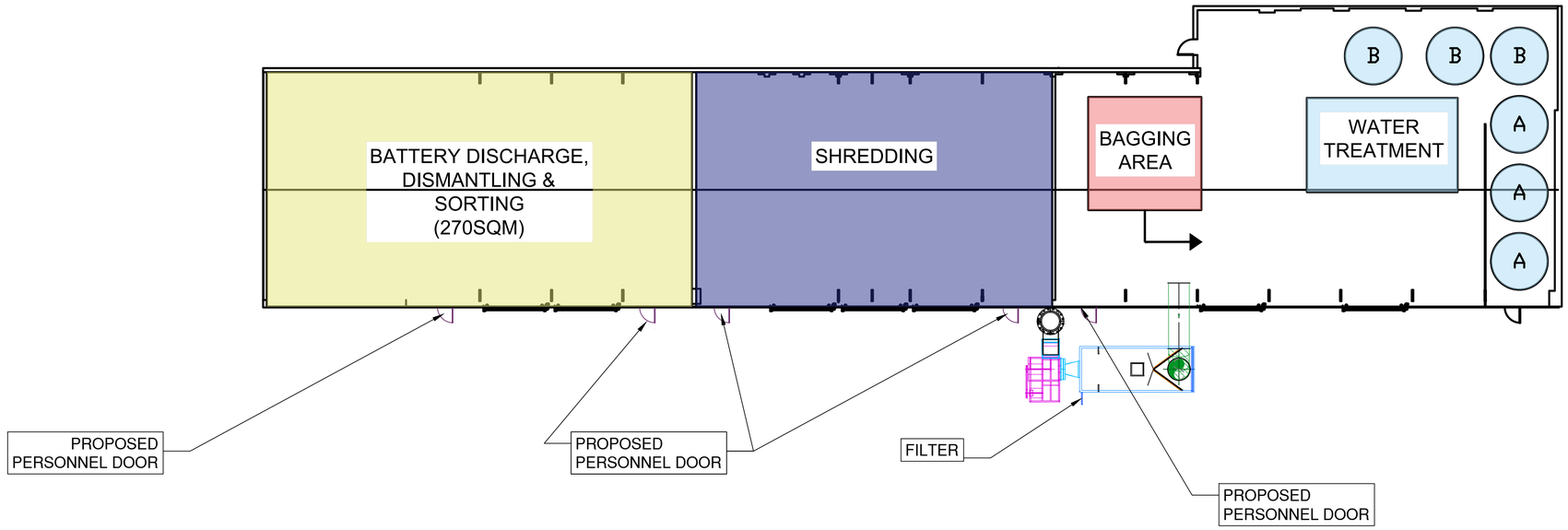
Job No. MINWORTH

Drawing No. VES_TD_MINWORTH_100_007

Revision -

Revision -

Drawing No. VES_TD_MINWORTH_100_008



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EXISTING SITE

KEY

SITE BOUNDARY

EFFLUENT TANKS (A)

WATER TANKS (B)

Rev	Description of revision	Drawn	Chkd	App	Date

VEOLIA

Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
Tel: 0207 812 5185

Project

FORGE LANE
MINWORTH
SUTTON COLDFIELD B76 1AH

Title

PROPOSED
INTERNAL FLOOR PLAN

	Initials	Date	Scale	Sheet size
Drawn	RB	14.08.23	1:150	A1
Checked				
Approved				

Job No. MINWORTH

Drawing No. VES_TD_MINWORTH_100_008

Revision -

APPENDIX B

EMS

Veolia's Management System

Environmental Control | January 2023

Scope and Structure

All the activities undertaken as part of the Company's business are carried out in a controlled and legal manner, to ensure safety in operations, prevent damage and adverse environmental impacts. The management system structure allows us to meet and exceed the expectations of our customers and stakeholders, including regulatory authorities.

Veolia operates under an integrated management system that defines the business procedures, formulated to assist in meeting business objectives across the entire scope of Veolia's activities. The system is externally certified to ISO:14001 and therefore is subject to both internal and external audits to ensure compliance and to promote continual improvement. The Management System is an electronic platform, allowing widespread access across the business. The structure of the Management System revolves around Veolia Minimum Requirements and their associated toolkits, which are activity specific documents setting the minimum standards for Veolia locations that cover holistic risk.

In addition, there may be site specific procedures and working instructions which are maintained at site level, which can include matrices that demonstrate implementation of the management system.

All business representatives within Veolia work closely together to ensure that the information reflects a standardised and coordinated Veolia approach to the way we do business. Documents are regularly reviewed and communicated to employees and stakeholders.

Veolia is externally certificated to ISO 9001, ISO 14001, ISO 45001 and ISO 22301 and Competence Management System (CMS) by Lloyds Register who routinely audit a sample of sites to check compliance and adherence to the standards.

Certification details

Standard	Certification Number	Date of issue	Expiry Date
ISO 14001:2015 ISO 9001:2015 ISO 45001:2018 ISO 50001:2011 ISO 22301:2012 SSIP	10349301	1st April 2021	31st March 2024
Competence Management System - compost sites operating under an environmental permit	10405494	11th October 2021	10th October 2024

Environmental Aspects and Impacts

Veolia has a documented procedure to identify the operation's activities carried out on site, evaluate environmental aspects and impacts, and manage and minimise these where possible. Normal and abnormal operating conditions are considered, as well as direct and indirect aspects, incidents, potential emergency situations, and past, current and planned activities. Sites are required to review this annually or after any significant operational changes and amend accordingly.

Veolia's Management System

Environmental Control | January 2023

Objectives and Targets

Procedures are in place for the management, identification and review of objectives and targets. Sites are responsible for ensuring that specific targets are set, which both drive continual improvement on a site basis and contribute to overall strategic objectives.

Training and Competence

Veolia has a dedicated people development department that offers a wide range of training across the business, including Environmental Awareness and Environmental Permitting courses to enable managers and supervisors to responsibly manage sites in line with company procedures and legal requirements. COTC courses and refreshers are also offered to ensure technical competency standards are maintained. Further site based training is offered in the form of environmental updates examples include spill response, EWC codes and Hazardous waste changes.

Most permitted activities now operate under CMS and have transitioned away from CoTC to demonstrate technical competence.activities are now

All new staff are subject to a company induction which provides them with the tools to carry out their roles in a safe and competent manner

Reporting

Veolia uses AVA to monitor the environmental performance of sites and contracts. AVA enables trends to be identified and the appropriate action to be taken to mitigate and minimise environment related issues.

AVA is an internet based reporting system. This web-based tool allows all environmental accidents, incidents and near-misses to be reported by any user. There is also a function that allows for the reporting of any communication from an enforcing authority such as the Environment Agency including CAR reports. The system assigns an accountable person to take actions, in order to ensure continual improvement and appropriate controls are put in place.

Annual reporting is completed using our company wide global report, which contributes to the tracking and monitoring of our environmental and operational attributes.

Legislation

Veolia regularly reviews current legislation with industry groups, trade associations (ESA, CIA, and CIWM), regulatory bodies and internal staff to ensure that we are abreast of and implement appropriately any new legislative requirements that would affect our operations and our clients. This enables the review of new legislation, raising awareness and coordinating responses on draft legislation and consultations.

Veolia subscribes to CEDREC and Pegasus, a specialist organisation who translate complex laws into plain English for England, Wales, Scotland and Northern Ireland, providing expert relevant information that covers both Health & Safety

and Environmental legislation. CEDREC's team of expert legal authors are able to provide a combination of legal expertise and practical experience thus offering a succinct overview of any relevant piece of legislation.

On an annual basis, permitted sites will undertake permit audits to ensure full compliance to the conditions thereof. In addition, all locations will undertake an Other Legal Requirements audit to ensure that legislative requirements are met.

Auditing

The Head of Assurance has the overall responsibilities for the auditing programme across Veolia, in order to ensure that all parts of the management system, quality, health and safety and environment are evaluated in terms of their adequacy and effectiveness and its compliance with legislation and regulatory requirements. The frequency undertaken in accordance with Veolia minimum requirements. Each year the head of assurance determines and agrees with the external certification body the program of surveillance audits.

Audit reports and associated tasks are logged onto our audit database (AVA) and notified to the relevant managers with a timescale for closure. Evidence is required from the site managers for these tasks to be closed out by the auditor in a timely manner. Audit findings are analysed by Managers in order to detect and eliminate potential causes of non-conformances and thus prevent recurrence, wherever possible.

Analysis of the audit findings are included in the agenda for each Site Management Review. All audit findings that have an impact on the integrity of the Management System are included in the agenda of the Corporate Management Review. All managers must implement any changes to local procedures or other documents found to be necessary as a result of audit findings.

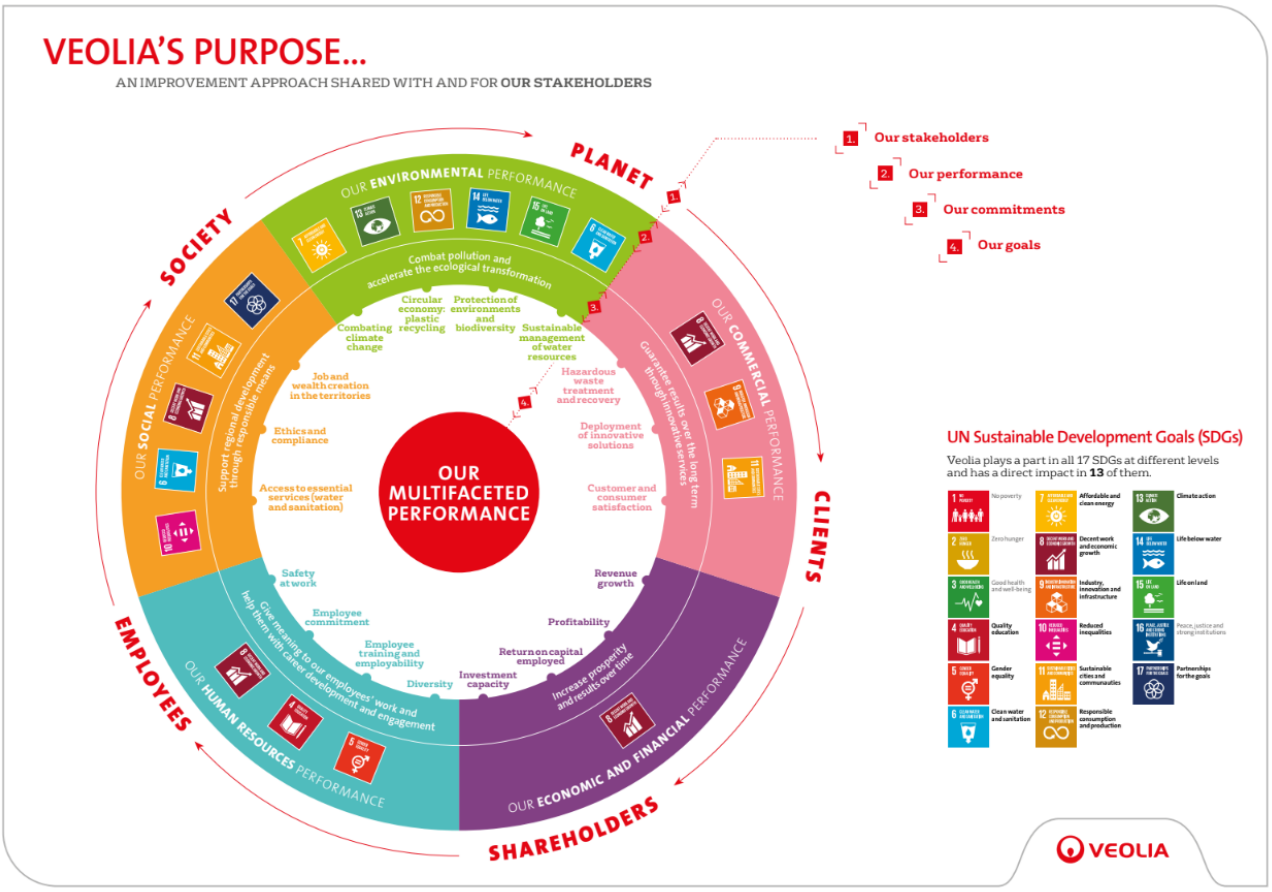
Veolia sites are also subject to external audits from our certification body, Veolia's parent company, Regulators (e.g. HSE and Environment Agency) and customers.

Climate Change Adaptation

Climate change adaptation is at the heart of Veolia's core values through our approach to the group's ambition of ecological transformation. As well as this, our response to climate change is covered within our multifaceted performance strategy aligning our operations to UN sustainability goals.

Veolia's Management System

Environmental Control | January 2023



You will note in the planet segment, there is reference to climate change which encompasses both adaptation to climate change effects, but also helping reduce the impacts of climate change for our stakeholders. Lastly, our commitment to change adaptation is reinforced through our Environmental Sustainability and Environmental Policy Statement, which is endorsed at board level in the UK&I.

More widely, our head office team in Paris is to integrate prospective physical risk management into our risk management system; which includes climate risk as a focus for 2023 Our progress made over 2022 was described in the Universal Registration Document 2022.

At a site level, each will complete a specific site risk assessment, which will be in place prior to April 2024.

Written Management System Matrix – Example

This matrix has been compiled to show the location of key documents in relation to management condition 1.1.1 and is in accordance with 'How to comply with your permit'.

Item	Location	Additional Information
Site Permit	Manager's office - *Environmental*. Main permit displayed on notice board	Main site permit available for all site staff to view as necessary – SYS/2/001
Site layout Plan	Displayed in prominent places namely driver waiting area, driver canteen, cabinet in main office corridor	This plan details the specific characteristics of the site including traffic management, fuel storage PPE zones etc
Site drainage Plan	Managers office	This plan details the site drainage layout. Plans are in place to colour code the actual drain covers on site
Aspects & Impacts assessment	Managers office	This comprehensive spreadsheet identifies the significant aspects and impacts from a number of factors and details the control measure therein – ENV/2/004
Business Continuity Plan	This plan is produced in accordance with ISO 22301 and is kept in managers office, folder 5 - *Accidents&Emergencies*. Copies are also located in the weighbridge office and main notice board	Business continuity plans are written and approved by Veolia's Risk & Insurance department and are designed to ensure that our business remains operational in the event of significant crisis – SYS/2/028, Crisis Policy, SYS/2/027
Site Emergency Plan	Kept in folder 5 - *Accidents&Emergencies*, located in the manager's office. It is also displayed on the notice board and a copy kept in the weighbridge office	This plan details the measured employed in relation to an emergency event. All site staff are trained in emergency response – SYS/2/027
Organogram	An up to date copy of the site organisation chart is kept in Folder 1 - *General* located in the managers	This details the site staff whom are responsible (either in part of entirely) for permit compliance

	office and is also on display on the notice boards in the staff canteen and weighbridge office.	
Site Training Matrix	The training matrix is on display in the main office corridor and notice board in the weighbridge office	The matrix is a snapshot of the key minimum competencies (required based on position) for running the site. Certificates to validate training are located in the relevant personnel files – SYS/2/006
Plant & Equipment Maintenance Records	Located in applicable folders in managers office	Preventative and swift reactive maintenance is vital to ensure the smooth running of the site. Details for all plant and machinery including the weighbridge and RDF machinery can be found in these files – HS/2/045, SYS/2/011
Fire Risk Assessment	Located in managers office Folder 6 - *Risk Assessments*, along with other site specific risk assessments	This document complies with the requirements of TGN 7.01 – HS/2/004, HS/2/028
Objectives & Targets	Kept in Folder 1 - *General* in managers office	In order to demonstrate continual improvement, all Veolia locations need to establish objectives and targets for the forthcoming year. These need to reflect any corporate targets, but will also include objective linked with the identification of significant environmental impacts – SYS/2/003
Site Diary	Although no longer a requirement under modern permits, the site still completed a daily diary entry. The diary is kept in the downstairs corridor next to the sign in book	As part of the Veolia Business Management System, all operational sites are required to complete daily and monthly inspection forms, which cover the majority (if not all) environmental considerations – see below
Daily Site Inspection Sheet	Current inspection sheets are kept in the weighbridge office, once complete they are kept in Folder 5 - *site inspection*	This is a comprehensive list of QHSE and insurance checks that site are required to complete on a daily basis – SYS/2/015

Monthly Site Inspection Sheet	These are kept in Folder 5 - *site inspection* managers office	A comprehensive monthly snapshot of QHSE and insurance compliance at site level – SYS/2/015
Permit Checklist and Other Legal Requirements Checklist	Printed outputs are kept in the permit folder in the meeting room	Each operational site is required to complete an electronic permit review checklists and Other Legal requirements checklist which is subject to internal and external audit. Completed checklists remain with Rivo Safeguard – SYS/2/017
Complaints	Although the site has not received any complaints, outputs will be kept in the permit folder located in managers office	There is a standard procedure for the investigation of complaints and the recording can be either electronically via Rivo Safeguard or paper based – SYS/2/007
Contractor Induction Records	Located in Site induction files in managers office	All contractors onto Veolia sites must be inducted. The contractor will be made aware of environmental factors and reporting events – HS/2/013
Management Reviews	Kept in the management review folder located in managers office	A management review pro-forma is required to be completed on a monthly basis. This form details items such as complaints, audits, training etc – SYS/2/002
QHSE Monthly Report	Kept in the monthly QHSE folder, located in the meeting room and also displayed on the notice board in driver waiting area and staff canteen	This is a PowerPoint presentation sent to the site on a monthly basis details QHSE compliance for the current year
Environmental Risk Assessment	Managers office - Folder 6 *Risk Assessments*	RDF - ERA V3 February 2019 - submitted with permit variation application
Fire Prevention Plan	Managers office - Folder 13 *Fire*	Fire Prevention plan CDON/FMP/V2 April 2015 - submitted with permit variation application
Odour Management Plan	Managers office - Folder 4(2) *Environmental*	Odour Management plan CDON/OMP/V2 Feb 2015 - submitted with permit variation application

APPENDIX C

ENVIRONMENTAL RISK ASSESSMENT AND H1

				Judgement				Action (by permitting)	
Source	**Pathway**	**Receptor**	**Harm**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
- Shredding activity -									
Point source or fugitive release (not including odour) during shredding	Air transport then inhalation	Local human population and site staff	Harm to human health - illness	Low	Medium	Medium	Wet shredding operation which is unlikely to generate particulates. Point source emission point from the shredding operation will be abated.	Shredding carried out inside a building with local air extraction to an abatement system. Site roads swept as necessary. Waste stored in appropriate containers and inside building or covered storage areas Regular maintenance and inspection of the air abatement system If any spillage of waste occurs the operation will cease immediately and will be dealt with using spillage procedures as a precaution. The proposed process is not high rate, high volume so there will be sufficient time available to undertake the operation with the appropriate level of care. Regular inspection of the area will be carried out. The battery shredding operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west. These receptors would not be impacted by dust given the nature of the operation and their distance away from the site.	Low

Release of effluent to sewer during shredding	Transmission through the surface water management drainage network from spillages	Receiving water course	Adverse impact to the water course	Low	Medium	Medium	Process water to be contained and treated prior to discharge to sewer or removal from the site. The shredding process will use a dewatering screen to remove excess liquids The site has a sealed drainage system linked to foul sewer. There is no pathway to the surface water. Risk assessment should consider the impact to receiving watercourse	Releases to surface water are not likely to present a risk. Shredding will take place within a sealed unit, which itself is within a building. Spilt or leaked material (including fluids) will, rather than being disposed of to surface water be cleaned up and disposed of at a suitably authorised waste management facility.	Low
Noise or vibration emitted during shredding activity	Propagation direct from source and secondary pathways (e.g. reflection, diffraction, transmission through buildings)	Occupiers of local sensitive receptors	Nuisance / annoyance	Low	Medium	Medium	The magnitude of the noise source is small from the proposed operation	Shredding will take place within a sealed unit, which itself is within a building. The battery shredding operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west. These receptors would not be impacted by noise/vibration given the nature of the operation, the design of the buildings and their distance away from the site.	Low

Point source release of odour from the shredding activity	Air transport then detection	Occupiers of local sensitive receptors	Nuisance / annoyance	Low	Medium	Medium	Loss of primary containment will be by exception. Treatment carried out within a sealed system with air extraction and abatement. Also within a building Waste types accepted are unlikely to be odorous	Shredding carried out inside a building with local air extraction to an abatement system. The battery shredding operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west.. These receptors would not be impacted by odour given the nature of the operation and their distance away from the site.	Low
- Discharging activity -									
Point source or fugitive release (not including odour) during the discharging activity	Air transport then inhalation	Local human population and site staff	Harm to human health - illness	Very Low	Medium	Low	The manual discharge activity will not release fugitive emissions. It is anticipated that the water bath discharge of batteries will not release fugitive emissions.	No emissions are expected from the manual or water bath battery discharge operation. Initially, monitoring will be undertaken above the water bath. If required an LEV may be installed to manage any emissions. The battery discharge operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west. These receptors would not be impacted by dust given the nature of this specific operation and their distance away from the site.	Very Low
Release of effluent to surface water during discharge activity	Transmission through the surface water management drainage network from spillages	Receiving water course	Adverse impact to the water course	Very Low	Medium	Low	The manual discharge activity will not give rise to effluent. The site has a sealed drainage system linked to	Manual discharging undertaken within a building. Releases to surface water are not likely to present a risk. Water bath discharge is only undertaken in a dedicated bay with impermeable surfaces and sealed drainage. Any loss of material from primary containment will be by exception and will be dealt with immediately at source in accordance with spillage procedures. Spilt or leaked material (including fluids) will, rather than being disposed of to	Very Low

							foul sewer. There is no pathway to the surface water. The water bath discharge activity will create effluent contaminated with the same materials as the shredding water. Eg metals and electrolyte.	surface water be cleaned up and disposed of at a suitably authorised waste management facility.	
Noise or vibration emitted during discharging activity	Propagation direct from source and secondary pathways (e.g. reflection, diffraction, transmission through buildings)	Occupiers of local sensitive receptors	Nuisance / annoyance	Very Low	Medium	Low	The magnitude of the noise source is very small from the proposed operation The manual discharge activity and water bath will not give rise to noise or vibration emissions	Manual discharging undertaken within a building The battery discharge operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west. These receptors would not be impacted by noise/vibration given the nature of this specific operation and their distance away from the site.	Very Low
Point source release of odour from the discharging activity	Air transport then detection	Occupiers of local sensitive receptors	Nuisance / annoyance	Very Low	Medium	Low	The manual or water bath discharge activities will not give rise to odour. Waste types accepted are unlikely to be odorous	The battery discharge operations are not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west. These receptors would not be impacted by odour given the nature of this specific operation and their distance away from the site.	Very Low

- Storage activities -									
Releases of particulate matter (dusts)	Air transport then inhalation.	Local human population & Site staff	Harm to human health - respiratory irritation and illness.	Low	Medium	Medium	Local residents are often sensitive to dust Waste types accepted are unlikely to generate particulates. Storage areas within the building or covered storage areas	Waste is contained at all times in rigid UN approved sealed weather-proof containers. They are securely sealed at the place of production. Incoming waste will remain within primary containment at all times during storage. There is therefore minimal potential for fugitive emissions. Shredded material will be stored in FIBCs, either in the building during the initial drying or in covered outside storage areas. The material is unlikely to generate dust. Speed restrictions are in place on site for the movement of waste in vehicles to minimise the likelihood of waste material becoming dislodged during transport around the site. Regular maintenance of hardstanding ensures the development of unevenness in the roadways which could dislodge waste material during transit is avoided. The battery storage operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west. These receptors would not be impacted by dust given the nature of the operation and their distance away from the site.	Low
Contaminated water from storage of waste	Runoff overground	Surface water or groundwater	Pollution of surface water or groundwater	Low	Medium	Medium	The site has a sealed drainage system linked to sewer. The shredding process will use a dewatering screen to remove excess liquids The initial drying stage will capture any free liquids. Outside storage bays will also capture liquids as the shredded material dries.	Releases to surface water are not likely to present a risk. The shredding process will be undertaken with a building. The process will dewater the material as much as possible prior to storage in FIBCs. All liquids will be contained. The initial drying phase will also be undertaken within the building and liquids will be contained at the draining stations. Further liquid containment will be provided in the outdoor drying areas. Any loss of material from primary containment will be by exception and will be dealt with immediately at source in accordance with spillage procedures. Spilt or leaked material (including fluids) will, rather than being disposed of to surface water be cleaned up and disposed of at a suitably authorised waste management facility.	Low

Odour emissions from storage of waste	Air transport and detection	Local human population	Nuisances, loss of amenity	Low	Medium	Medium	Local residents / businesses could be particularly sensitive to odours of a waste nature. Waste types accepted are unlikely to be odorous	Batteries and shredded batteries are unlikely to give rise to odour, however waste will be stored and handled in accordance with the Appropriate Measure guidance. The battery storage operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west.. These receptors would not be impacted by odour given the nature of the operation and their distance away from the site.	Low
Release of effluent to surface water from storage	Transmission through the surface water management drainage network from spillages	Receiving water course	Adverse impact to the water course	Low	Medium	Medium	The site has a sealed drainage system linked to foul sewer. Any spillages wll be dealt with via Spillage containment procedures. Waste drying bays will be constructed with sealed drainage systems There is no pathway to the surface water management system Risk assessment should consider the impact to receiving watercourse	Releases to surface water are not likely to present a risk. The shredding process will be undertaken with a building. The process will dewater the material as much as possible prior to storage in FIBCs. All liquids will be contained. The initial drying phase will also be undertaken within the building and liquids will be contained at the draining stations. Further liquid containment will be provided in the outdoor drying areas. Any loss of material from primary containment will be by exception and will be dealt with immediately at source in accordance with spillage procedures. Spilt or leaked material (including fluids) will, rather than being disposed of to surface water be cleaned up and disposed of at a suitably authorised waste management facility.	Low

Animals, Pests and Insects from storage of wastes	Atmosphere and land	Local human population	Nuisances, loss of amenity, harm to heath	Low	Low	Low	Local residents are often sensitive to pests/insects Scavenging animals/birds may spread disease Scavenging animals/birds may spread litter. Waste types accepted are unlikely to be attractive to pests or insects.	Batteries and shredded batteries are unlikely to attract pest or vermin, however waste will be stored and handled in accordance with the Appropriate Measure guidance. Storage areas will be regularly monitored to check for pests and vermin, breached containers and spillages. Good housekeeping will be ensured by regular cleaning of the storage area. The battery storage operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west. These receptors would not be impacted by pests given the nature of the operation and their distance away from the site.	Low
Escape of litter from storage of wastes	Release from storage and carried off site by wind or on vehicles	Local human population	Nuisances, loss of amenity	Low	Medium	Medium	Local residents / businesses could be particularly sensitive to escaped litter. Waste types accepted are unlikely to generate litter	Batteries and shredded batteries are unlikely to generate litter, however waste will be stored and handled in accordance with the Appropriate Measure guidance. All loads of waste entering the site will be contained within primary packaging so the escape of litter from containment will not be a routine occurrence. In rare cases where loss of containment does occur this will be dealt with as a priority in accordance with procedures for spillages. Visual inspection of litter levels will be undertaken on a daily basis. The battery storage operation is not in a sensitive location. The activity is located within the wider Minworth Trade Park and approximately 20m from the nearest industrial receptor. The site is located 515m west of the Plantsbrook Reservoirs Local Nature Reserve (LNR). There are 12 No, Local Wildlife Sites (LWS) and 4 No. Ancient Woodland sites listed within the 2km screening distance, the nearest one being 1.7km to the south. There are no other designated sites within the screening distance of the site. There are a number of residential properties within 1km of the site. The closest residential areas are approximately 170m to the north and 210m to the south west. These receptors would not be impacted by litter given the nature of the operation and their distance away from the site.	Low

H1 Assessment

EPR/KP3396FQ

Minworth Battery Reuse and Recycling Facility

Veolia ES (UK) Limited
August 2023

H1 risk assessment of point source emissions to air from the recycling of lithium batteries at Minworth Battery Reuse and Recycling Facility

1. Overview

The proposed plant at Minworth will be designed principally to recycle lithium batteries via a discharging and wet shredding process. Approximately 95% of throughput is expected to be L-ion batteries with the remainder consisting of the primary lithium type. The maximum design capacity of the plant will be approximately 2.5 tonnes per hour. Measures will be in place to control air emissions including both primary and secondary abatement. The impact of emissions to air have been evaluated using the Environment Agency Guidance 'Air emissions risk assessment for your environmental permit and the results and assumptions are included in this document.

2. Battery structure

A battery pack may consist of hundreds or thousands of cells grouped into modules and connected together to achieve the power and energy requirements of the application. The cell, which is the building block of the pack, is composed of four main components: two electrodes (a cathode, and an anode), a separator and an electrolyte. Most commonly, lithium ion batteries consist of a negative electrode made of graphite and a positive electrode based on a layered transition metal oxide such as $LiCoO_2$ and $LiNiO_2$ or mixtures thereof. A permeable membrane soaked with an electrolyte, which is a mixture of organic carbonates as solvents and the conductive salt $LiPF_6$, separates the electrodes. To maintain balanced charge within the cell, electrons flow through an external circuit in the same direction to the lithium transfer. A separator facilitates the selective transfer of Li+ whilst maintaining electrical isolation between the positive and negative terminals to prevent unwanted discharging and short circuit. During normal use, energy is stored and released through the transfer of Lithium ions between the two electrodes via the separator and the electrolyte. To safely discharge the cell, the cathode and the anode must be connected by the way of a load bank. The load bank regulates the flow of electrons and reduces their energy state, allowing for the safe transfer between the two electrodes.

The electrolyte comprises a mixture of solvents, additives and a conductive salt. Solvents include cyclic carbonates such as ethylene carbonate (EC) or propylene carbonate (PC) as well as open chain carbonates such as dimethyl carbonate (DMC), ethyl methyl carbonate (EMC) or diethyl carbonate (DEC). The combination of these solvents provides the possibility to adjust certain physical characteristics such as liquid range, dielectric permittivity or dipole moment. Lithium hexafluorophosphate ($LiPF_6$) is predominantly used as the conductive salt - to establish ionic conductivity.

3. Site location and receptors

The Facility is located off Forge Lane in Minworths industrial area. The primary purpose of the plant is storage and treatment of lithium batteries.

Human receptors - The land use surrounding the Facility is predominantly industrial in nature, the closest area of relevant residential exposure for short and long term exposure are approximately 234m to the south west. The site is within Birmingham Air Quality Management Area 'AQMA' which is declared for Particulate Matter PM10 (24-Hour Mean), Nitrogen dioxide NO2 (Annual Mean); the source is stated to be from road traffic.

Ecological receptors - There are no Sites of Special Scientific Interest within a 2km buffer and no Special Areas of Conservation, Special Protection Areas or RAMSAR sites within 5km of the site. Ecological receptors are therefore not considered further in the assessment.

4. Emission Inventory

Table 1 provides a list of potential air emissions from the battery recycling process including a description of the compound and likely release characteristics. The list is not exhaustive, for example there are additional electrolyte additives in use however it is characteristic of typical plant throughput.

Table 1 - Battery recycling emissions inventory

Compound	Description
Dimethyl carbonate 'DMC'	Open chain carbonates which are esters of carbonic acid. Mixtures of these compounds form the electrolyte, which is a mixture of organic carbonates as solvents and the conductive salt $LiPF_6$
Diethyl carbonate 'DEC'	
Ethy methyl carbonate 'EMC'	
Ethylene carbonate 'EC'	Cyclic carbonates which are esters of carbonic acid. Mixtures of these compounds form the electrolyte, which is a mixture of organic carbonates as solvents and a $LiPF_6$ conductive salt.
Propylene carbonate 'PC'	
Methyl tert butyl ether	Less commonly used electrolytes.
Cyclohexanol	
Dimethoxyethane	
CO_2	A product of the battery ageing process e.g. from the reaction of lithium and DMC or EMC at the solid electrolyte interface.

CO	A product of the battery ageing process e.g. from the reaction of lithium and DMC or EMC at the solid electrolyte interface.
Hydrogen Flouride 'HF'	A product of the decomposition of the conductive lithium salt $LiPF_6$
Ethyle Acetate (ethyl ethanoate)	A common organic solvent. Addition of ethyl acetate to electrolyte decreases the charge transfer resistance and also the total resistance of lithium-ion batteries.
Cyclohexylbenzene 'CHB'	CHB is widely used as an electrolyte additive for overcharge protection of lithium-ion batteries. Cyclohexyl benzene electrochemically polymerizes to form a polymer between the separator and cathode potentials lower than that for electrolyte decomposition blocking overcharging.
Cyclohexane	An additive decomposition product as the battery ages.
Dust / metals	Dust fraction could include lithium transition metal oxides from the cathode powder, graphite from the anode powder, separator plastics such as poly ethylene and poly propylene, binders such as polyvinyl fluoride, copper and aluminium from current collectors, steel casing plus electrolyte.

5. Plant design

Key elements of proposed plant design are described below:

- A lifting tipper feed assembly.
- A series of 2 shredders with enclosed conveyors.
- A ring of 6 nozzles will be positioned in the shredder 1 hopper to provide a flow of water through the system. The water flow will be interlocked to ensure that batteries are not fed into the hopper until the water flow has been switched on for 10 seconds and the flow will continue for 30 seconds after shredding has been completed (both timers are to be adjustable and the will be set during commissioning).
- An air extraction system comprising a wet scrubber and carbon filter.
- A water filtration system to include a filter press, capable of filtering the shredder process water and the water drained from the shredded material.
- A storage area for the initial / first stage drying of the bagged shred material with local exhaust ventilation routed to the air extraction system.
- Process water storage tanks.

- An external covered storage bay housing discharging baths for non-EV batteries (e.g. e-bikes, scooters, hand tool batteries).
- Two 40ft shipping containers and bunded yard area for the storage of waste batteries that require quarantine (the containers are fitted with an automated 'Stat-X' potassium-based aerosol fire suppression system and a deluge system that is fed by a dry riser).
- Outside covered storage bays for the storage of incoming batteries and for the second stage drying of the shred material.

6. Process description

The incoming industrial (EV) Li-ion and Li primary batteries will be stored in designated covered concrete bays. During the first stage of processing batteries will be discharged of their remaining electrical energy and dismantled to cell or module level. The level of dismantling will depend on the structure of the battery pack, modules, and cells and whether their format is cylindrical, pouch or prismatic. All recyclable materials associated with the battery pack, such as aluminium cases, copper, electronics, and cardboard packaging will be segregated and stored prior to off site recovery. Hand-tools batteries will be discharged in stillages filled with water or a Sodium Chloride (NaCl) solution for 1 to 7 days, depending on battery type. The stillages will be stored in a dedicated covered storage bay. The discharged batteries will then be processed by a series of two substantially enclosed wet shredders. Shredder number 1 will mill the input battery size down to approximately 25mm. The material will then be discharged into shredder number 2, which will further reduce the size to approximately 11mm. The output material from the shredder assembly will then be discharged onto a dewatering screen with associated sump. The dewatering screen will be designed to remove a large proportion of the water used during the shredding process into a designated collection tank. From the dewatering screen the shredded material will be transported by a screw conveyor to the bagging station where the material will be discharged into 1m^2 Intermediate Bulk Containers (FIBC) bags. The bagging station will comprise two filling stations with forklift bag hangers, a pneumatically actuated changeover valve and four drain stations for the bags to be stored for up to 24 hours within the building under LEV. All bags will be placed on top of a collection pan / tank which will be connected to the main shredding water filtration system. The air extraction system will be operational over the initial drying area to remove any fugitive VOCs that may be emitted during first stage drying. Following the initial drying period the bagged shred will be stored in the dedicated outside covered storage bays until sufficiently dry to be transferred off site. This could be up to 30 days,

depending on ambient temperatures. The bays will have a dedicated drainage system to capture any runoff liquids.

7. Process flow

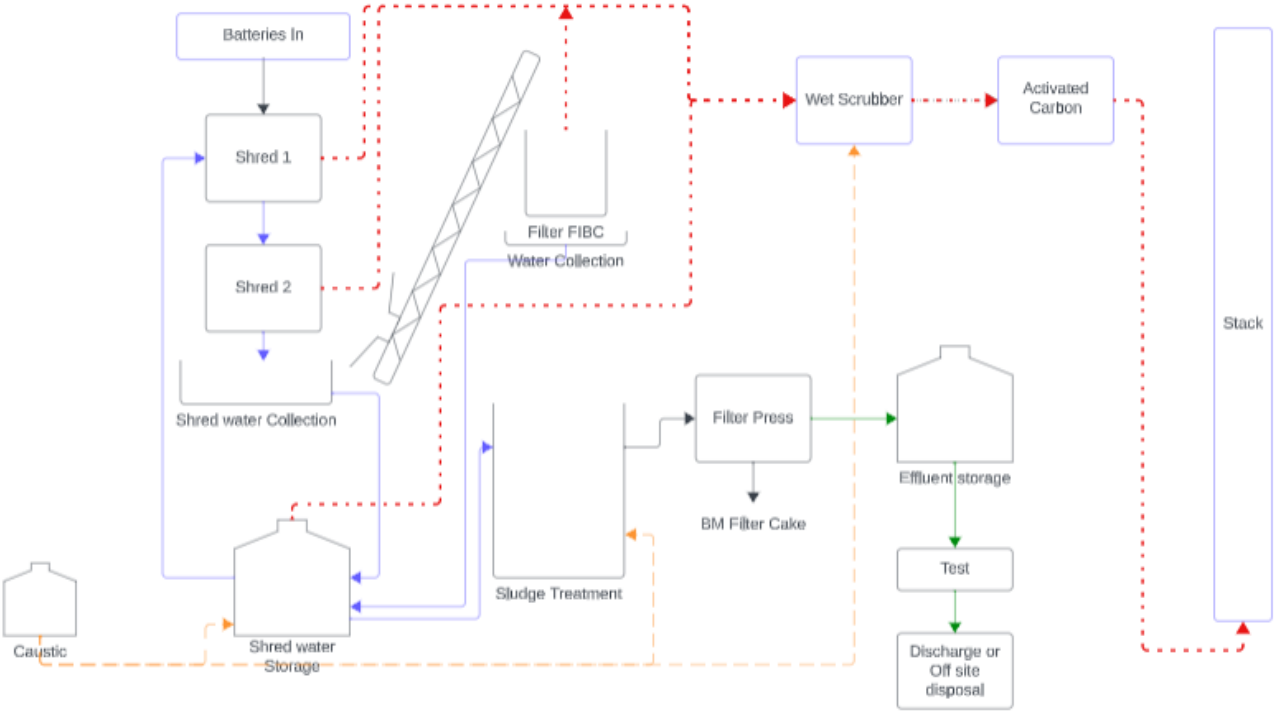
A process flow diagram is provided in figure 1 showing the integration of the air extraction system with the processing plant. Air will be extracted from the substantially enclosed shredders 1 and 2, the shred water storage and collection sump, and the first stage drying area. Emissions from tanks containing water / electrolyte wastes that may generate VOC emissions to air are controlled, e.g. with a flow-balancing systems, and/or abated via the air extraction system.

8. Air Extraction system

The extraction system will include the following;

- Coarse / large particle filter to protect downstream stages
- Wet scrubber with reagent and liquor recirculation pumps
- Alkali dosing system
- Activated carbon pack with replaceable elements
- Extraction fan
- Ducting
- Exhaust stack running on the outside of the building to 1 m above the roof level
- The extraction / abatement system will be interlocked with the rest of the plant.

Figure 1 - Process flow and air extraction points



9. Wet scrubber

Wet scrubbers are designed to reduce concentrations of chemical pollutants from discharge airflows. The proposed system is a packed bed scrubber with a highly efficient gas / liquid contactor designed for the purpose of removing pollutants from contaminated air from the battery recycling process and discharging abated air to atmosphere. The system is designed so the scrubbing liquor falls down the tower while the contaminated air passes up the tower allowing maximum mass transfer between a soluble gas and solvent. The filtered air will be exhausted through an approximately 3m integrated stack located at grid reference SP 14873 92307 situated next to the northern flank of the treatment building.

The extended base section of the scrubber will be utilised as a collection tank for the scrubbing solution and also as a location for the recirculation pump, level controls and pH sensor. The scrubbing solution is pumped from the scrubber base to the top of the packed bed section via the recirculation pipework system and is evenly distributed over the bed via a distributor located at the top of the packed bed section. The scrubbing solution passes through the bed by gravity over the packing and down to the base collection tank.

The system operates under a regime in which the pH of the scrubbing liquor is continuously monitored. The control panel is fitted with an alarm and if the pH of the liquor deviates from a set value then the alarm will sound.

The system will use a caustic water scrubbing solution balanced to a pH of 8-10 using a concentrated solution of NaOH or KOH. This balance is maintained automatically by additions of NaOH or KOH by a chemical feed pump controlled by a pH control system whose sensor is mounted in the recirculation tank.

The BREF for Common Waste Gas Management and Treatment Systems in the Chemical Sector gives indicative abatement efficiencies for VOC of 50 - 99%. The VOC in the emissions inventory are all readily soluble so the efficiency can be anticipated to approach the top end of the range.

There will be a drying stage following the wet scrubber to prevent a moist gas stream entering the carbon which could result in a decrease in filter efficiency.

10. Carbon

Activated carbon is a porous material made up of a random structure of graphite platelets. The structure gives activated carbon a very large surface area and porosity which allows it to adsorb a wide range of both polar and non-polar volatile compounds. Gas phase adsorption is a condensation process which will take place when the adsorption energy in the pores of the activated carbon is sufficient to condense the vapour. The condensed vapour then remains in the pore structure of the carbon as a liquid. All organic compounds are adsorbable to some extent with the main factors being molecular weight, vapour pressure and liquid density. The lower the vapour pressure, the more easily the compound can be condensed in the pores of the carbon. The VOC compounds forming the battery electrolyte mixtures will be readily adsorbed by activated . The kinetics of VOC adsorption are excellent as the breakthrough capacity (when the compounds start to be found in the outlet) is very close to the saturation capacity meaning that the full capacity of the activated carbon can be used. The carbon filter used at the facility will be a fixed bed adsorber where untreated air will be fed into the bottom and passed through the bed to the point of emission to atmosphere.

Removal efficiency of activated carbon is typically very high even at low residence times. The BREF for Common Waste Water and Waste Gas Treatment/Management

Systems in the Chemical Sector provides some data relating to the VOC abatement efficiency of GAC giving a range of 80 - 95% after work by Schenk et al. 2009. The BREF lists toluene abatement efficiency as 90%. The molecular weight of DMC (90.08g/mol) is similar to toluene and is likely to predict a similarly high removal efficiency. The other electrolytes and additives have similar or higher molecular weights also predicting effective GAC adsorption.

11. Hydrogen fluoride 'HF'

In contact with aerial humidity $LiPF_6$ decomposes and forms hydrogen fluoride. The emission of HF will be controlled in two ways: firstly the batteries will be discharged prior to shredding which will reduce the internal short circuit / joule heating effect and the reactivity of the shred material. Secondly, the pH of the water irrigation system will be maintained at or slightly above neutral which prevents the formation of hydrogen fluoride which is an acid gas. The presence of elemental lithium in the battery shred also prevents the formation of hydrofluoric acid by reacting with the water to form LiOH which then reacts with the HF to form lithium fluoride, LiF.

Due to the primary HF control measures in place it is not considered further numerically in the H1 assessment. Any HF produced would be readily abated by the wet scrubber with the BREF for Common Waste Water and Waste Gas Treatment/Management Systems predicting efficiencies of around 99%.

12. Particulates

Wet processing of the batteries within the shredder and accompanying substantially enclosed conveyor system will control particulate emissions including metals as close to the source as possible. The first stage shredder will be continuously irrigated by a ring of six nozzles positioned in the hopper. This configuration will ensure that battery inputs are deluged at the point of entry into the shredder. The continuous flow system amounting to a total of at least 30 litres per minute will ensure that water flows through both stages of the shredder and the associated conveyor system. Particulate suppression will therefore be achieved by agglomeration due to the capillary effect of water minimising any aerial emissions. The water flow will be interlocked to ensure that batteries immediately enter a wet atmosphere before shredding. An average flow of 1,800 litres per hour will be used during commissioning although system design will allow for this to be adjusted to optimise emissions control. This will allow for a set point ensuring maximum process and dust control with the minimum water usage (note dust control may not always be the limiting factor). There will also be a boost option

integrated into the system design to increase water flow levels to 3,600 l/hr. The water boost system will be triggered in the following instances:

- Peak inputs - manually during a peak input , to ensure material entering the process is fully irrigated
- Temperature - temperature increases within the shredder
- Fire - any signs of fire or smoke

Due to the primary dust / particulate control measures in place it is not considered further numerically in the H1 assessment. Any dusts which were produced would be readily abated by the wet scrubber with the BREF for Common Waste Water and Waste Gas Treatment/Management Systems predicting efficiencies of 70 - 99%.

13. Dioxin / furan / PCB / BRF (POPs), CO and CO_2

Available literature including Kwade. A., Diekman. J and Sattar. et.al. does not indicate dioxin and furan emissions are likely to be observed from the subject process. PCB content is likely to be very low or not present at all in the battery inputs and is not expected in the emissions profile. It is possible some plastic components may have been impregnated or coated with brominated fire retardants which are POPs. CO and CO_2 which may be produced due to decomposition inside the battery as it ages will not be produced in significant quantities relevant to the environmental standard (i.e. the process does not involve combustion).

14. Volatile Organic Carbon

VOC will be released during the shredding process from the electrolyte and additive mixture released once the batteries are broken apart. An abatement system has been designed to reduce these compounds in the gas stream before emission to atmosphere.

15. Stack height and dispersion

The integrated standing stack serving the scrubber is approximately 3m emitting just above the eaves of the treatment plant building. As the stack is less than 2.5 times the height of the directly adjacent building there is potential for dispersion of emissions to be subject to the effects of airflow over the building envelope. In accordance with Environment Agency guidance for screening purposes the effective stack height is treated as zero. Figure 2 shows the general layout of the plant.

16. Operational profile

The plant is expected to operate for 10 hours per day on a standard working week basis resulting in a maximum annual load of 30%.

17. H1 Source data

Emissions concentrations for the H1 assessment have been estimated from work conducted by Diekmann et.al. Emissions of by far the most commonly used electrolytes, DMC and EMC, have been scaled from experimental data based on gas released from laboratory scale shredding of 18650 battery cells with a nominal voltage of 3.6 V and a capacity of 2250 mAh. Emissions of other electrolytes are conservatively assumed to be at the same level as DMC. The emissions of the electrolyte Ethylene carbonate and the additives Cyclohexylbenzene and Cyclohexane have been assumed to be in the same proportions as the experimental work carried out by Diekmann et.al. Table 2 lists key H1 source input data.

Figure 2 - Location of proposed air abatement plant

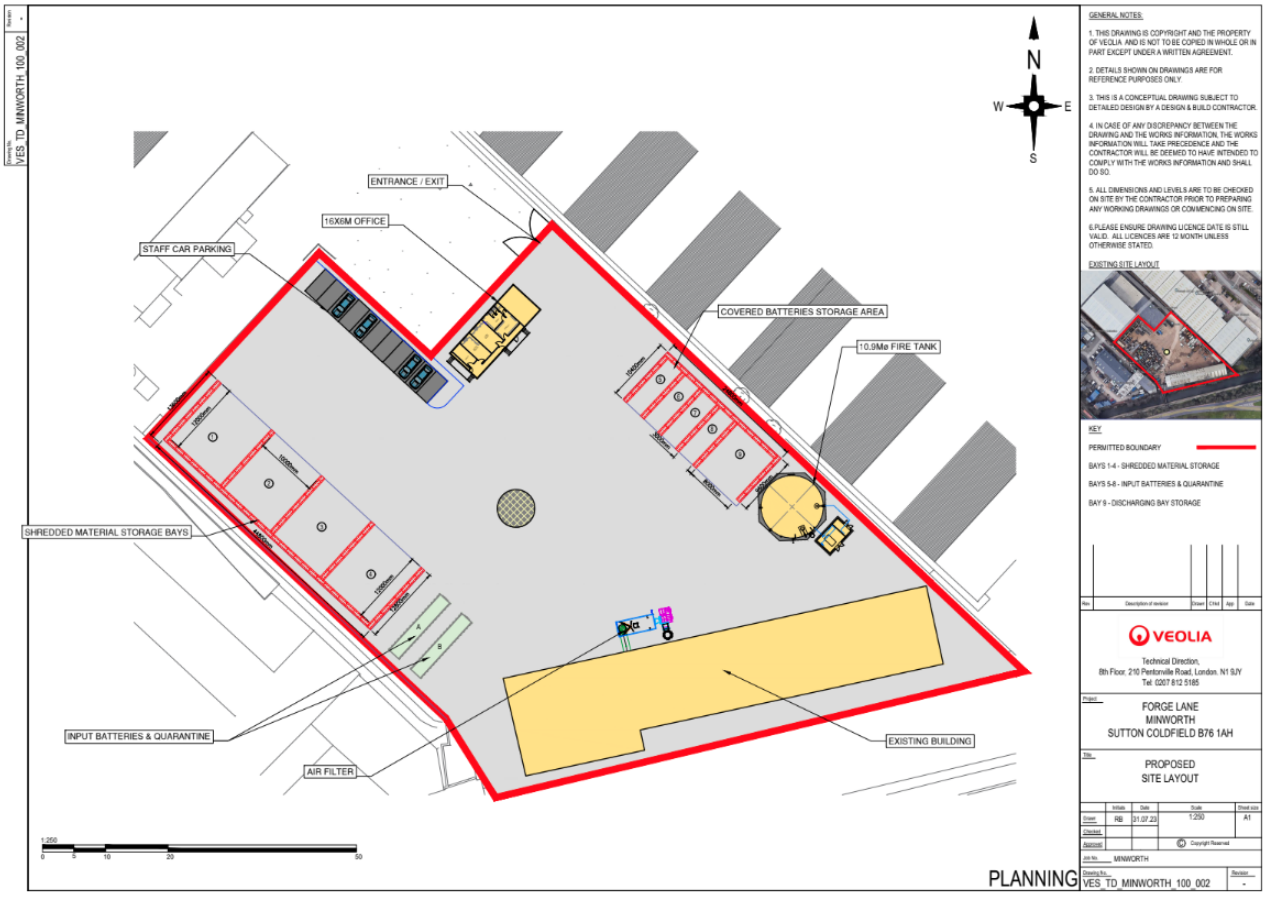


Table 2 - H1 source input data

Item	Unit	Value
Stack data		
Stack height	m	1 metre above roof level
Effective stack height	m	0
Stack location	OS Grid Reference	SP 14873 92307
Flue gas conditions		
Operating temperature	°C	Ambient
Volume at actual conditions	Am^3/s	3800
Operational profile	%	30% based on a standard working week and a 10h d^{-1} operating period.
Wet scrubber abatement efficiency	%	50 - 99
Carbon filter abatement efficiency	%	80 - 95

Note - a conservative overall nominal abatement efficiency of 90% has been assumed in the assessment

18. Air quality assessment criteria

There are no air quality assessment criteria available for the electrolytes and additives likely to be present as a VOC mixture emitted from the recycling process.

18.1. Screening using Benzene AQAL

As a conservative starting point emissions can be treated as 100% benzene. Benzene background concentrations are available from DEFRA (UK Air). The latest projections available relate to levels predicted in 2010 and are therefore considered conservative. The highest recorded predicted 2010 benzene background concentration within the nine 1km grid squares surrounding the site is 0.438µg m^3 . The results of screening of short and long term emissions assuming the VOC mix is 100% benzene are described in table 3. The concentration of Benzene entering the abatement system is estimated as the total of combined predicted DMC and EMC emissions.

Table 3 - Screening long term and short term emissions assuming 100% benzene

Substance	Concentration mg m^3	Release rate gs^{-1}	PC µg m^3	AQAL µg m^3	% PC of the AQAL	PEC µg m^3	% PEC of the AQAL
Benzene (Long term)	492	0.051	2.30	5	46.18	2.74	54.88
Benzene (Short term)				30	398.33	119.93	411.81

(1) The total abatement efficiency is assumed to be 90%
(2) The load factor for the long term assessment is assumed to be 30%, no adjustment is made for the short term assessment
(3) A factor of 0.59 has been applied to the 24 hour (short term) standard to convert to an hourly standard

18.2. Screening using further assessment

Table 3 shows that long term VOC emissions can be screened out as 'not significant' on the basis that the PEC is less than 70% of the applicable long term environmental standard for benzene. Short term emissions do not screen out as insignificant based on the conservative assumptions made in the model. In the absence of short term environmental standards a wider review of relevant assessment levels has been undertaken. The results of this review are summarised in table 4.

Table 4 - Literature search for relevant alternative exposure levels

Substance	Data review
Dimethyl carbonate	OEHHA FINAL REVISED HEALTH ASSESSMENT FOR DIMETHYL CARBONATE November 18, 2010 offers an interim Recommended Exposure Level 'REL' of 18,000µg m^3 for acute exposure and 5500µg m^3 for chronic exposure. This is derived from the REL for methanol based on the rapid metabolism of dimethyl carbonate to methanol. KOWA Americal Corporation (and others) provide a 8hr TWA PEL of 100ppm equivalent to 369,190µg m^3 based on the rapid metabolism of dimethyl carbonate to methanol. Sciencelab.com provides a TWA: 200 STEL: 400 (ppm) equivalent to 738,380µg m^3 and 1,476,760µg m^3 respectively. The U.S. Department of Energy's (DOE's) current data set of Protective Action Criteria (PAC) gives a PAC-1 level of 39,000µg m^3. PAC-1 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, when exposed for more than one hour, could experience notable discomfort, irritation, or certain asymptomatic, nonsensory effects. However, these effects are not disabling and are transient and reversible upon cessation of exposure. EA air quality assessment levels are available for methanol giving 2,660µg m^3 as an annual mean and 33,300µg m^3 as a 1 hour mean.
Ethyl methyl carbonate	No data could be located for ethyl methyl carbonate however the European Chemicals Agency registration dossier confirms the toxicokinetics to be similar to DMC - rapid metabolism to ethanol as well as methanol.
Ethylene carbonate	The U.S. Department of Energy's (DOE's) current data set of Protective Action Criteria (PAC) give a PAC-1 level of 30,000µg m^3
Diethyl carbonate	The U.S. Department of Energy's (DOE's) current data set of Protective Action Criteria (PAC) give a PAC-1 level of 59,000µg m^3
Propylene carbonate	The U.S. Department of Energy's (DOE's) current data set of Protective Action Criteria (PAC) give a PAC-1 level of 34,000µg m^3
Ethyl Acetate	EH40/2005 gives an 8 hour TWA of 734,000µg m^3 8hr and a short term exposure limit of 1,468,000µg m^3 (15min)

	The U.S. Department of Energy's (DOE's) current data set of Protective Action Criteria (PAC) give a PAC-1 level of 430,000µg m^3
Cyclohexylbenzene	The U.S. Department of Energy's (DOE's) current data set of Protective Action Criteria (PAC) give a PAC-1 level of 20,000µg m^3
Cyclohexane	UK EH40/2005 gives WELs for this substance including 8 hour TWA of 350,000µg m^3 8hr and a short term exposure limit of 1,050,000µg m^3 (15min)

The results of the review of relevant alternative assessment levels allow for further evaluation of the risk posed by the expected VOC mixture likely to be emitted from the facility. The review identified a number of assessment levels from different sources which principally relate to workplace exposure. All of the assessment levels identified appeared to be underpinned by toxicological data however a detailed review of their derivation has not been considered in this document although references are provided. There were several sources available for DMC including the California Office of Environmental Health Hazard Assessment (OEHHA), several material safety data sheets (MSDS) and the US Department of Energy (DoE). Two of the relevant compounds had UK workplace exposure limits 'WEL' obtained from the HSE EH40/2005. The remainder of the limits were obtained from the U.S Department of Energy in the form of hourly 'Protective Action Criteria' (PAC). While they are not intended to be used to derive environmental standards they exist for a great many compounds and are useful for comparative purposes in this case, allowing evaluation of the relative risk for different compounds. Realistic conservative interim assessment criteria can be derived by applying a conservative safety factor to the identified exposure criteria. This broadly follows the methodology used by the Environment Agency to derive air quality assessment criteria from EH40 WELs. Although use of this method is being reviewed by the Environment Agency it can be useful in cases where no other criteria are available. In cases where a STEL was available from EH40 a safety factor of 10 has been used. A more conservative safety factor of 50 has been used where only a PAC-1 was available. Where an OEHHA limit was available no safety factor was applied as this is already equivalent to an air quality assessment level.

Table 5 is a review of short term emissions against a set of proxy air quality assessment levels derived from the literature review. Where a range of assessment levels were identified all have been shown. In the case of DMC the PAC-1 value including the safety factor is the most conservative. Given the similarity between the compounds and the range of the PAC-1 criteria this most likely indicates they are conservative for all of the carbonate compounds. Background concentration data is

not available for the identified compounds however it is assumed to be very low, therefore no estimation has been made of the headroom as this is not considered necessary. In all but four cases the PC is less than 10% of the proxy AQAL and therefore likely to be 'insignificant'. In four cases; one of the DMC estimates, EC, DEC, and PC the impact is shown to be less than 20% of the available headroom with the assumption that background levels are extremely low.

Table 5 - further evaluation of short term emissions from the shredding process

Substance	Concentration mg m^3	Release rate gs^{-1}	PC µg m^3	Assessment level µg m^3 / source	Safety factor	Proxy air quality assessment level	PC % interim AQAL
Dimethyl carbonate	310.67	0.052	127.9	368,190 / MSDS	10	36,819	0.347
Dimethyl carbonate	310.67	0.052	127.9	18,000 / OEHHA	1	18,000	0.711
Dimethyl carbonate	310.67	0.052	127.9	39,000 / PAC-1	50	780	16.397
Ethyl methyl carbonate	No available criteria						
Ethylene carbonate	156.97	0.017	75.23	30,000 / PAC-1	50	600	10.77
Diethyl carbonate	310.67	0.052	127.9	59,000 / PAC-1	50	1180	10.83
Propylene carbonate	310.67	0.052	127.9	34,000 / PAC-1	50	680	18.81
Ethyl Acetate	310.67	0.052	127.9	1,468,000 / EH40	10	146,800	0.087
Ethyl Acetate	310.67	0.052	127.9	4,300,000 / PAC-1	50	86,000	0.149
Cyclohexylbenzene	62.13	0.0069	26.9	20,000 / PAC-1	50	400	6.731
Cyclohexane	8.18	0.00086	3.36	1,050,000 / EH40	10	105,000	0.003
Cyclohexane	8.18	0.00086	3.36	1,000,000 / PAC-1	50	20,000	0.017

19. Emissions monitoring

The facility is not yet operational and therefore no monitoring has been completed. Following commissioning we would anticipate the following monitoring will be carried out.

H1 validation monitoring: A compressed set of monitoring carried out to confirm the expected emission profile of the plant. An indicative initial monitoring suite is outlined in table 6. It is intended that monitoring at the inlet to the filter and the outlet will be carried out. The frequency and number of samples collected will be established based on the initial set of results.

Table 6 - indicative H1 validation monitoring suite

Pollutant	Standard
Dust emissions	BS EN 13284-1
Metals and metalloids except mercury	EN14385
Dioxin-like polychlorinated biphenyls	EN1948-4
Polychlorinated dibenzo-p-dioxin/furan(s)	EN1948-1 Parts1, 2 and 3
Speciated VOC including DMC, EMC, EC, DEC, PC, Ethyl Acetate and the additives cyclohexyl benzene and cyclohexane	SRM - PD CEN-TS 13649:2014
Total VOCs	BS EN 12619

Routine emissions monitoring: Periodic ongoing emission monitoring for permit compliance will be carried out following H1 validation. It is proposed that the scope of monitoring will be agreed with the Environment Agency once empirical characterisation of the emissions profile has been carried out.

Process monitoring: Daily monitoring of key process parameters will be undertaken to ensure optimal functioning of the facility. The table below lists additional process monitoring parameters.

Parameter	Description
TVOC	A handheld Photo Ionisation Detector 'PID' will be used to monitor total VOC concentrations from the filter once per day in accordance with a written procedure. The results will be recorded and trends in emissions will be reviewed monthly to look for indications that the VOC / carbon mass transfer zone is approaching the filter outlet into the stack.
Temperature	The temperature inside the shredder will be monitored to ensure water dosing systems can be adjusted correctly to prevent excessive joule heating and minimise the reactivity of the shred.
pH	pH will be monitored both in the shredder water recirculation system to ensure a neutral to alkali pH is maintained to prevent formation of HF. The pH of the wet scrubber liquor will be monitored to ensure alkaline conditions are maintained.
Pressure drop	The pressure drop across the abatement system will be monitored continuously. This will highlight any potential problems with the system including blockages.

Monitoring ports and access considerations: A monitoring port will be integrated into the design of the stack including a platform. The location of the stack and platform / temporary platform will be of a design that will allow MCERTS monitoring of stack emissions. A second monitoring port will be installed at the inlet to the carbon filter firstly to allow confirmation of the air emissions inventory and secondly to allow for monitoring of the filter efficiency.

20. Carbon exchange

A precautionary approach will be taken with carbon exchange to ensure the facility does not operate until filter breakthrough. The initial frequency will be set during the first few weeks and months of shredder operation, using data collected from daily PID monitoring, routine MCERTS monitoring and will include carbon saturation testing.

21. Discussion

The expected emissions from the proposed battery recycling facility at Minworth have been characterised and evaluated. Emissions have the potential to comprise a particulate fraction including associated metals and conductive salts and a mix of VOC from the electrolytes. Hydrogen fluoride could be produced from decomposition of the conductive lithium salts.

Application of the wet shredding technology will contain particulate matter within the processing equipment. A pH dosing system will be used to prevent acid gas formation

(HF). VOC released from the electrolyte mix will be captured by an abatement train including a wet scrubber with pH control and an activated carbon filter in series. Any incidental HF and dust emissions would be abated by the wet alkali scrubber.
A H1 assessment has been carried out first taking the conservative assumption that emissions have an assessment criteria equivalent to benzene. In this case, long term emissions screen out as 'not significant' based on 2010 predicted background levels and do not require further assessment.

Short term emissions as benzene were not screened out and have therefore been evaluated further. In the absence of applicable air quality assessment criteria a literature search was carried out to identify alternative criteria to support the risk assessment. Several sources of information were identified and, using conservative safety factors, proxy air quality assessment criteria have been derived. Following further evaluation of the predicted process contributions of the expected VOC mix, all compounds screened out as 'insignificant' or 'not significant'.

There is a degree of uncertainty represented by the derivation of proxy air quality assessment levels. However, there are several layers of conservatism built into the model. Firstly, abatement efficiency is assumed to be 90% on the basis that either the wet scrubber or carbon filter may actually be sufficient in isolation which can be determined once the plant is operational. In combination the alkali scrubber and carbon filter are likely to approach 99% efficiency. Secondly the plant throughput is assumed to be at maximum level on a continuous basis whereas in practice it is likely to be lower. In addition, the H1 model is inherently conservative as it does not fully consider efflux velocity from the stack or the distance to sensitive receptors.

Once the plant is operational, monitoring will be carried out to confirm the actual emissions profile and the H1 assessment will be revisited using empirical input data.

22. Conclusions

The results of the risk assessment and screening exercise show that operation of the plant can be conservatively treated as 'not significant' in air quality terms. The proposed scrubber systems will be subject to operation, servicing and maintenance in accordance with manufacturer's recommendations. Procedures will be in place to ensure filter media and reagents are replaced when required and any malfunctions or breakdowns are detected quickly and resolved. It is therefore considered that it is appropriate to proceed with plant commissioning with a review indicated once operational monitoring data becomes available.

23. References

Kwade. A., Diekman. J., Recycling of Lithium-Ion Batteries, The LithoRec Way, Springer, 2018

SATTAR. A., COOPER. L., DOWSON. M., GREENWOOD. D., Considerations in Lithium-ion Battery Recycling, Advanced Propulsion Centre, University of Warwick

MSDS, KOWA American Corporation:, Dimethyl Carbonate
http://portlandcleanair.org/files/merge/msds/DIMETHYL_CARBONATE_DMC.PDF

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT, OEHHA FINAL REVISED HEALTH ASSESSMENT FOR DIMETHYL CARBONATE November 18, 2010.
http://www.aqmd.gov/docs/default-source/planning/1168/dmc_oehha_memo.pdf

HSE, EH40/2005 Workplace exposure limits
https://www.hse.gov.uk/pubns/priced/eh40.pdf

U.S. Department of Energy's (DOE's) Protective Action Criteria (PAC) database
https://edms3.energy.gov/pac/TeelDef

DEFRA UK air website - https://uk-air.defra.gov.uk/data/laqm-background-home

APPENDIX D

BAT ASSESSMENTS

Waste Treatment BREF BAT reference: Description from BREF document		Adherence to BAT	Deviation from BAT
Section 1.1 – General BAT Conclusions			
BAT 1	In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS)	Yes	EMS adopted as part of ISO:14001 accreditation
BAT 2	In order to improve the overall environmental performance of the plant, BAT is to use waste pre-acceptance, acceptance, tracking, segregation and compatibility procedures	Yes	Utilising Pre-acceptance and acceptance procedures used by Veolia's other hazardous waste transfer and treatment operations.
BAT 3	In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the environmental management system (see BAT 1)	Yes	n/a
BAT 4	In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques set out in the guidance such as storage optimisation, capacity and safety.	Yes	Utilising and enhancing existing operational procedures used by Veolia's other hazardous waste transfer and treatment operations.
BAT 5	In order to reduce the environmental risk associated with the handling and transfer of waste, BAT is to set up and implement handling and transfer procedures.	Yes	Utilising and enhancing existing operational procedures used by Veolia's other hazardous waste

			transfer and treatment operations.
BAT 6	For relevant emissions to water as identified by the inventory of waste water streams (see BAT 3), BAT is to monitor key process parameters (e.g. waste water flow, pH, temperature, conductivity, BOD) at key locations (e.g. at the inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	Yes	Key parameters will be measured during the treatment process and prior to discharge
BAT 7	BAT is to monitor emissions to water with at least the frequency set out in the guidance and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	Yes	n/a
BAT 8	BAT is to monitor channelled emissions to air with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	Yes	n/a
BAT 9	BAT is to monitor diffuse emissions of organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPs with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques given below.	n/a	n/a
BAT 10	BAT is to periodically monitor odour emissions.	Yes	n/a
BAT 11	BAT is to monitor the annual consumption of water, energy and raw materials as well as the annual generation of residues and waste water, with a frequency of at least once per year.	Yes	n/a
BAT 12	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:	Yes, however waste storage and treatment unlikely to generate odours	n/a
BAT 13	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques given in the guidance.	Yes	Odour control measures are appropriate for this

			operation, given the low risks from odour
BAT 14	In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques given in the guidance	Yes	n/a
BAT 15	BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques given in the guidance.	n/a	n/a
BAT 16	In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given in the guidance.	n/a	n/a
BAT 17	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: I. a protocol containing appropriate actions and timelines; II. a protocol for conducting noise and vibration monitoring; III. a protocol for response to identified noise and vibration events, e.g. complaints; IV. a noise and vibration reduction programme designed to identify the source(s), to measure/estimate noise and vibration exposure, to characterise the contributions of the sources and to implement prevention and/or reduction measures.	Yes	Noise control measures are appropriate for this operation, given the negligible risks from noise
BAT 18	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of techniques given in the guidance	Yes	n/a
BAT 19	In order to optimise water consumption, to reduce the volume of wastewater generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques given in the guidance.	Yes, process water will be reused where possible.	n/a
BAT 20	In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given in the guidance.	Yes	n/a

BAT 21	In order to prevent or limit the environmental consequences of accidents and Incidents, BAT is to use all of the techniques given in the guidance, as part of the accident management plan (see BAT 1).	Yes	Set out in the Emergency Plan
BAT 22	In order to use materials efficiently, BAT is to substitute materials with waste.	n/a	n/a
BAT 23	In order to use energy efficiently, BAT is to use both of the techniques given In the guidance	Yes	Energy usage is monitored and reported on an annual basis in accordance with permit conditions.
BAT 24	In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging, as part of the residues management plan (see BAT 1).	Yes	n/a
Section 2.1 – General BAT Conclusions: Mechanical Treatment of waste			
BAT 25	In order to reduce emissions to air of dust, and of particulate-bound metals, PCDD/F and dioxin-like PCBs, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance.	Yes, wet scrubbing will be used	n/a
Section 2.2 - BAT conclusions for the mechanical treatment in shredders of metal waste			
BAT 26	In order to improve the overall environmental performance, and to prevent emissions due to accidents and incidents, BAT is to use BAT 14g and all of the techniques given below: (a) implementation of a detailed inspection procedure for baled waste before shredding; 17.8.2018 L 208/69 Official Journal of the European Union EN (b) removal of dangerous items from the waste input stream and their safe disposal (e.g. gas cylinders, non- depolluted EoLVs, non-depolluted WEEE, items contaminated with PCBs or mercury, radioactive items); (c) treatment of containers only when accompanied by a declaration of cleanliness.	Yes	n/a
BAT 27	In order to prevent deflagrations and to reduce emissions when deflagrations occur, BAT is to use technique a. and one or both of the techniques b. and c. given in the guidance.	Yes	n/a

BAT 28	In order to use energy efficiently, BAT is to keep the shredder feed stable.	Yes	n/a
Section 2.3 - BAT conclusions for the treatment of WEEE containing VFCs and/or VHCs			
BAT 29	In order to prevent or, where that is not practicable, to reduce emissions of organic compounds to air, BAT is to apply BAT 14d, BAT 14h and to use technique a. and one or both of the techniques b. and c. given in the guidance	n/a	n/a
BAT 30	In order to prevent emissions due to explosions when treating WEEE containing VFCs and/or VHCs, BAT is to use either of the techniques given in the guidance	n/a	n/a
Section 2.4 - BAT conclusions for the mechanical treatment of waste with calorific value			
BAT 31	In order to reduce emissions to air of organic compounds, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance.	n/a	n/a
Section 2.5 - BAT conclusions for the mechanical treatment of WEEE containing mercury			
BAT 32	In order to reduce mercury emissions to air, BAT is to collect mercury emissions at source, to send them to abatement and to carry out adequate monitoring.	n/a	n/a
Section 3.1 - General BAT conclusions for the biological treatment of waste			
BAT 33	In order to reduce odour emissions and to improve the overall environmental performance, BAT is to select the waste input.	n/a	n/a
BAT 34	In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H2S and NH3, BAT is to use one or a combination of the techniques given in the guidance.	n/a	n/a
BAT 35	In order to reduce the generation of waste water and to reduce water usage, BAT is to use all of the techniques given in the guidance.	n/a	n/a
Section 3.2 - BAT conclusions for the aerobic treatment of waste			

BAT 36	In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters.	n/a	n/a
BAT 37	In order to reduce diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps, BAT is to use one or both of the techniques given in the guidance.	n/a	n/a
Section 3.3 - BAT conclusions for the anaerobic treatment of waste			
BAT 38	In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters.	n/a	n/a
Section 3.4 - BAT conclusions for the mechanical biological treatment (MBT) treatment of waste			
BAT 39	In order to reduce emissions to air, BAT is to use both of the techniques given in the guidance	n/a	n/a
Section 4.1 – BAT Conclusions for Physico-chemical treatment of waste			
BAT 40	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	n/a	n/a
BAT 41	In order to reduce emissions of dust, organic compounds and NH3 to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance	n/a	n/a
Section 4.2 – BAT Conclusions for the re-refining of waste oil			
BAT 42	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	n/a	n/a
BAT 43	In order to reduce the quantity of waste sent for disposal, BAT is to use one or both of the techniques given in the guidance.	n/a	n/a
BAT 44	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance	n/a	n/a
Section 4.3 – BAT Conclusions for the physico-chemical treatment of waste with calorific value			

BAT 45	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance.	n/a	n/a
Section 4.4 – BAT Conclusions for the regeneration of spent solvents			
BAT 46	In order to improve the overall environmental performance of the regeneration of spent solvents, BAT is to use one or both of the techniques given in the guidance.	n/a	n/a
BAT 47	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use a combination of the techniques given in the guidance	n/a	n/a
Section 4.5 – BAT-AEL for emissions of organic compounds to air from the re-refining of waste oil, the physico- chemical treatment of waste with calorific value and the regeneration of spent solvents			
Table 6.9	BAT-associated emission level (BAT-AEL) for channelled emissions of TVOC to air from the re-refining of waste oil, the physico-chemical treatment of waste with calorific value and the regeneration of spent solvents	n/a	n/a
Section 4.6 - BAT conclusions for the thermal treatment of spent activated carbon, waste catalysts and excavated contaminated soil			
BAT 48	In order to improve the overall environmental performance of the thermal treatment of spent activated carbon, waste catalysts and excavated contaminated soil, BAT is to use all of the techniques given in the guidance.	n/a	n/a
BAT 49	In order to reduce emissions of HCl, HF, dust and organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance	n/a	n/a
Section 4.7 - BAT conclusions for the water washing of excavated contaminated soil			
BAT 50	In order to reduce emissions of dust and organic compounds to air from the storage, handling, and washing steps, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance	n/a	n/a
Section 4.8 - BAT conclusions for the decontamination of equipment containing PCBs			

BAT 51	in order to improve the overall environmental performance and to reduce channelled emissions of PCBs and organic compounds to air, BAT is to use all of the techniques given in the guidance.	n/a	n/a
Section 5.1 – BAT Conclusions for treatment of water-based liquid waste			
BAT 52	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	n/a	n/a
BAT 53	In order to reduce emissions of HCl, NH3 and organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance	n/a	n/a

Treating Metal Waste in Shredders Appropriate Measures - Description		Adherence to BAT	Deviation from BAT
Section 2 – General Management Appropriate Measures			
Section 2.1 – Management System			
Item 1	You must have and follow an up-to-date, written management system that incorporates the following environmental performance 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 ● managing change ● emergency preparedness and response ● making sure you comply with environmental legislation You check environmental performance and take corrective or preventative action, paying particular attention to: ● monitoring and measurement	Yes, the site will adopt the same Veolia management system as other Veolia waste sites.	n/a

	● 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 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 ● odour management plan, if required ● noise and vibration management plan, if required ● dust management plan, if required ● pest management plan, if required ● fire prevention plan, if required ● climate change risk assessment, if required Your management system can also include, for example, product or service quality, operational efficiency and health and safety in the workplace.		

Section 2.2 – Staff Competence			
Item 1	Your site must be operated at all times by an adequate number of staff with appropriate qualifications and competence.	Yes	n/a
Item 2	The design, installation and maintenance of infrastructure, plant and equipment must be carried out by competent people.	Yes	n/a
Item 3	You must have appropriately qualified managers for your waste activity who are either: ● qualified under a technical competence scheme ● operating under a government approved technical competence scheme	Yes, TCM will be in place	n/a
Item 4	Non-supervisory staff must be reliable and technically skilled. Their skills may be based on experience and relevant training.	Yes	n/a
Section 2.3 – Accident Management Plan			
Item 1	As part of your written management system you must have a plan for dealing with any incidents or accidents that could result in pollution.	Yes, the site will have an Emergency Management Plan	n/a
Item 2	The accident management plan must identify and assess the risks the facility poses to human health and the environment. Areas to consider may include: ● waste types and the risks that they pose ● robust waste acceptance procedures (see section 3) to avoid receiving unwanted items, such as gas cylinders, undepolluted end-of-life vehicles (ELVs) and radioactive items ● failure of abatement system ● 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 overfilling) ● damaged Li-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	Yes, also covered in other management system document, i.e. site storage plan, waste acceptance and waste pre-acceptance procedures	n/a

	• extreme weather conditions for example flooding or very high winds		
item 3	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?	Yes, undertaken via HAZOP and Major Accident Hazard Risk Assessment	n/a
item 4	In particular, you must identify any fire risks that may be caused, for example by: • arson or vandalism • self-combustion, for example within the finer fractions of the shredder residue or within swarf piles • 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 • reactions between incompatible materials • neighbouring site activities • sparks from loading buckets • hot loads deposited at the site • damaged Li-ion batteries in waste electronic and electrical equipment (WEEE) and light iron, heavy melting steel piles and waste from household waste recycling centres • batteries left connected in ELVs which can short circuit • batteries (storage, processing and handling) • ELV depollution activities (if carried out on your site) • deflagrations within the shredder and pre-shredders This list is not exhaustive and you must have a fire prevention plan that identifies the risks at your site and meets the requirements of our fire prevention plan guidance.	Yes, undertaken via Fire Risk Assessment	n/a

	The depth and type of accident risk assessment you do will depend on the characteristics of the plant and its location. The main factors to take into account 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		
item 5	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	Yes	n/a
item 6	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.	Yes	n/a
item 7	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 by carrying out emergency drills and exercises	Yes	n/a
Section 2.3 – Accident prevention measures			
Waste acceptance and pre acceptance procedures			
Item 1	You must have clear and detailed procedures for pre-acceptance and acceptance of waste and for rejected and quarantined wastes.	Yes, the site will adopt the same procedures as other Veolia waste sites.	n/a
Item 2	These should be produced and maintained as set out in the waste pre-acceptance, acceptance and tracking appropriate measures section.	Yes	n/a
Segregating waste			
Item 3	You must keep apart incompatible wastes. Examples could include but are not limited to: ● storing lead acid batteries separately to nickel metal hydride batteries	Yes	n/a

	● segregating flammable gas cylinders in cages away from oxygen cylinder		
Preventing accidental emissions			
Item 4	You must make sure you contain the following (where appropriate) or route to the effluent system (where necessary): ● process waters ● site drainage waters ● emergency firefighting water ● oil or chemical contaminated waters ● spillages of oils and chemicals	Yes, a connection to sewer is already in place for yard water runoff Discharge of process effluent from the site will be controlled. In the event of a fire, any fire water will be contained.	n/a
Item 5	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 taking into account the: ● nature of the pollutants ● effects of downstream waste water treatment ● sensitivity of the receiving environment	Yes, the site will have full rainwater management system to deal with all eventualities	n/a
Item 6	You can only discharge waste water from this buffer storage after you have taken appropriate measures, to control, treat or reuse the water.	Yes	n/a
Item 7	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.	Yes. Managed via Spill Control procedures. All storage areas will be bunded with dedicated drainage. In addition the whole site will be sealed.	n/a
Item 8	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.	Yes, the site drainage system will be adequately sized.	n/a
Item 9	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.	n/a	n/a

Security measures			
Item 10	You must have security measures (and staff) in place to prevent: ● entry by intruders ● damage to equipment ● theft ● fly-tipping ● arson	Site is fenced around the perimeter with a lockable gate. Access will be gained via a barrier and intercom system and a further swipe card system for entry to the main treatment building. The site will have remote CCTV monitoring as with other Veolia sites.	n/a
Item 11	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 CCTV	Yes	n/a
Fire prevention			
Item 12	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	Yes, waste is controlled via pre-acceptance measures. Waste segregation. Fire detection and suppression systems to be installed	n/a
Item 13	You must have a fire prevention plan that meets the requirements of our guidance.	Yes	n/a
Other accident prevention measures			
Item 14	You must maintain plant control in an emergency using one or a combination of the following measures: ● alarms ● process trips and interlocks ● manual interventions	Yes	n/a

Item 15	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 of repair 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, or following maintenance or other engineering work ● where relevant, use equipment and protective systems designed for use in potentially explosive atmospheres	Yes, a scheduled maintenance program will be in place.	n/a
Record keeping and procedures			
Item 16	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 (for example, AdBlu) 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	Yes, using Veolia's existing systems for recording accidents (AVA) and digital stock control (HAZMAT)	n/a
Section 2.5 – Contingency Plan and Procedures			
Item 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.	Yes, via Business Continuity Plan (BCP)	n/a
Item 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	Yes	n/a

	● 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		
Item 3	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.	Yes	n/a
Item 4	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. Iron, steel, aluminium and copper produced in accordance with the end-of-waste regulations remain waste and subject to waste controls until they are passed to the next holder.	Yes, set out in BCP	n/a
Item 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	Yes	n/a
Item 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 on the basis of extra cost or geographical distance.	Yes	n/a
Item 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 ● have the appropriate infrastructure in place	Yes	n/a
Item 8	Your management procedures and contingency plan must also: ● 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 to receive them ● have a defined procedure to identify, review and prioritise items of plant which need preventative maintenance ● include all equipment or plant whose failure could directly or indirectly affect the environment or human health ● identify ‘non-productive’ or redundant items such as tanks, pipework, retaining walls, bunds, reusable waste containers, ducts, filters and security systems	Yes	n/a

	● make sure you have the spare parts, tools, and competent staff needed before you start maintenance		
Item 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.	Yes, via AVA and Veolia Minimum Requirements (VMR)	n/a
Section 2.6 – Plant Decommissioning			
Item 1	You must consider how you will decommission the plant at the design stage, and plan how you will minimise risks during decommissioning. For existing plant, identify potential decommissioning risks and take steps to address these. You should 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.	Yes	n/a
Item 2	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	Yes	n/a
Item 3	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	Yes	n/a

	● 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) ● clearing deposited residues, waste and any contamination resulting from the waste treatment activities		
Item 4	You should make sure that equipment taken out of use is decontaminated and removed from the site.	Yes	n/a
Section 3 - Waste Pre-acceptance, Acceptance and Tracking Appropriate Measures			
Section 3.1 – Waste Pre-acceptance			
Item 1	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 and processes.	Yes, the site will adopt the same Veolia pre-acceptance procedures as other Veolia sites in the Hazardous waste business.	n/a
Item 2	Your procedures must follow a risk-based approach, considering: ● the source and nature of the waste ● its hazardous properties ● potential risks to process safety, occupational safety and the environment (for example, from deflagrations and other emissions such as noise or particulates)	Yes	n/a
Item 3	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 specific source of the waste – for example, ELV depollution site, general scrap metal transfer station, car manufacture, or metal from other types of manufacturing processes ● a description of the waste including its composition and quantity ● the List of Waste code (European Waste Classification, EWC, code) ● if the waste has an EWC code showing it is a non-hazardous mirror entry - you should request evidence of the assessment from the producer ● any hazardous properties or whether it contains any regulated chemicals, for example, POPs ● confirmation from the producer that ELVs have been depolluted to ELV directive requirements	Yes	n/a

	● confirmation from the producer that drums will be accompanied by a certificate of cleanliness		
Item 4	You must also get confirmation that the waste does not contain a radioactive source. If there is a risk of radioactive contamination you must get confirmation that the waste is not radioactive, unless your facility is permitted to accept such waste.	Yes	n/a
Item 5	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 deflagration (for example, gas or aerosol canisters, baled ELVs or undepolluted ELVs) ● a risk of fire (for example, small mixed WEEE containing Li-ion batteries, or Li-ion batteries within metal loads from other sources)	Yes, this is part of the central pre-acceptance technical team and by site staff	n/a
Item 6	You should establish a list of these wastes and procedures for managing the risks from them. 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.	Yes	n/a
Item 7	You must keep pre-acceptance records for at least 3 years in a computerised waste tracking system 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.	Yes	n/a
Item 8	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	Yes	n/a
Item 9	In all cases you must reassess the information required at pre-acceptance annually. 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 accumulating waste ● have enough storage and treatment capacity	Yes	n/a
Section 3.2 – Waste Acceptance and tracking			
Item 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 that you can accept it.	Yes, the site will adopt the same Veolia waste acceptance procedures as other Veolia sites in the Hazardous waste business.	n/a

Item 2	If the waste is not as expected, 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.	Yes, as above	n/a
Item 3	Procedures should be documented and auditable and must follow a risk-based approach, considering: ● the source, nature and age of the waste ● the waste's hazardous properties ● the waste's potential to contain POPs ● potential risks to process safety, occupational safety and the environment (for example, from odour and other emissions) ● knowledge about the previous waste holders Some facilities receive waste on an ad hoc basis, which may occur with loads of metal waste. In those instances you can still do pre-acceptance checks before you accept the waste. For example, by exchanging information at the weighbridge before accepting the waste on site.	Yes	n/a
Item 4	You must assess the load to make sure it is technically (and legally) suitable for the plant. Your checks and assessment must be risk-based considering, for example, the: ● hazardous properties of the waste ● risks posed by the waste in terms of process safety, occupational safety and environmental impact	Yes	n/a
Storage areas			
Item 5	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.	Yes	n/a
Item 6	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 in another way.	Yes	n/a
Item 7	You must clearly designate a materials reception area (or areas). Staff controlling the inspection, reception and validation of materials at the installation, must be trained in their respective roles.	Yes	n/a
Waste acceptance			
Item 8	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,	No weighbridge on site	Alternative measures including:

	based upon volume). You must record the weight in the computerised waste tracking system.		Deliveries may be accompanied by a weighbridge ticket Delivery vehicles may have on board weighing equipment Level indicator reading on receiving vehicles Volume of capacity of vehicles Volume of capacity of delivered containers and the number of containers Volume to weight conversion tonnes
Item 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.	Yes	n/a
Item 10	You must use clear criteria for rejecting 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.	Yes	n/a
Monitoring for radioactive substances			
Item 11	You must have fixed radiation detectors on weighbridges to monitor waste delivered to the site for any radioactive substances or materials. These detectors must have both a visual and audible alarm. You must also have a hand held detector to investigate alarms generated by the fixed radiation detectors.	n/a	n/a
Item 12	The radiation detection equipment must include solid state scintillation detectors and have a sensitivity to gamma radiation that is consistent with the minimum performance recommended by the International Atomic Energy Agency. These are specified in Annex IV of ‘Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal’, UNECE, 2006.	n/a	n/a

Item 13	You must maintain, calibrate and test the radiation monitoring equipment in accordance with the manufacturer's specification.	n/a	n/a
Item 14	You must have clear procedures for responding to radiation detector alarms. There is a standard rules permit available for radioactive material or radioactive waste that you receive unintentionally: SR2017 No1: Unintentional receipt of radioactive materials and radioactive waste by the operator of any facility which uses a radiation detection system.	n/a	n/a
Acceptance of drums and tanks			
Item 15	You must make sure you only receive and accept drums or tanks: ● that have a certificate of cleanliness ● with prior notice ● with hazard warning symbols obliterated	n/a for this operation	n/a
Acceptance of baled metal wastes			
Item 16	You must produce and follow a detailed procedure for accepting and inspecting baled material before accepting bales for processing. For example, batch acceptance, inspection and upstream auditing.	n/a for this operation	n/a
Item 17	You must carry out risk-based assessments for baled and other infeed materials. You must base your inspection and pre-processing procedures on these assessments before fragmentising. This may include, but not be limited to, different inspection frequencies for different customers, depending on risk.	n/a for this operation	n/a
Quarantine storage			
Item 18	You must establish quarantine areas for materials that are prohibited, awaiting full inspection, or awaiting testing or removal.	Yes	n/a
Item 19	Quarantine storage must be for a maximum of 14 working days. For some limited and specific cases (for example gas cylinders and beer barrels) you can extend the quarantine storage time if the Environment Agency agrees.	Yes	n/a
Item 20	You must have written procedures for dealing with wastes held in quarantine, and a maximum storage volume.	Yes	n/a
Item 21	Quarantine storage must be separate from all other storage and clearly marked as a quarantine area.	Yes	n/a

Item 22	You must identify and isolate gas cylinders and other prohibited items to remove them from the waste stream. You must store gas cylinders in locked cages. Where possible, you must send prohibited items back to the appropriate owner.	Yes	n/a
Section 3.3 – Waste Tracking			
Item 1	You must use a computerised 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.	Yes, using Veolia's HAZMAT system	n/a
Item 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 You must make this information readily available	Yes, using Veolia's HAZMAT and Salesforce systems	n/a
Item 3	You must create records and update them to show 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 intended treatment or disposal route ● accurate records of the nature and quantity of wastes held on site, including all hazards (identifying the primary hazards) ● where the waste is physically located on site	Yes, using Veolia's HAZMAT and Salesforce systems	n/a
Item 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	Yes, using Veolia's HAZMAT and Salesforce systems	n/a

Item 5	You must store back-up copies of computer records off site. Records must be readily accessible in an emergency.	Yes, backed up on Veolia servers	n/a
Item 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.	Yes	n/a
Section 4 – Waste Storage, Segregation and Handling Appropriate Measures			
Section 4.1 - Storage locations			
Item 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.	Yes, FLTs and staff trained to use suitable equipment	n/a
Item 2	You should design and operate your facility in a way that minimises waste handling.	Yes	n/a
Item 3	You must store shredder non-metallic fractions under cover.	Yes, shred waste to be stored in outside bays undercover to allow drying	n/a
Item 4	Where possible, you should locate storage areas away from watercourses and sensitive boundaries (for example, those close to public rights of way, housing or schools).	yes, where practicable	n/a
Item 5	You must store all waste within the security protected area of your facility to prevent unauthorised access and vandalism.	Yes, site secure	n/a
Section 4.2 - Storage duration and capacity			
Item 1	You must clearly establish the maximum storage capacity of the site and the designated storage areas. You must not exceed these maximum capacities.	Yes - see FPP	n/a
Item 2	You must define capacity in pile sizes as well as tonnage. You must regularly monitor the quantity of stored waste 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.	Yes - see FPP	n/a

Item 3	You must not accumulate waste. 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, you must comply with that condition for that waste.	Yes, using Veolia's HAZMAT system	n/a
Item 4	You must store all waste in a way that allows easy inspection. You must maintain safe access between piles of wastes. There must be pedestrian and vehicular access (for example shovel loader, crane, grab loader) at all times to the whole of the storage area.	Yes	n/a
Item 5	You must store and handle waste in a way that prevents pests and vermin, see our guidance on pest management plans. You must have specific measures and procedures in place to identify and manage any wastes that attract pests or vermin at your site.	Yes, however wastes types are unlikely to attract pests.	n/a
Item 6	You must inspect storage areas, containers and infrastructure daily. You must deal with any issues immediately. You must keep written records of the inspections. You must rectify and log any waste spillages.	Yes	n/a
Item 7	You must not carry out activities that represent a clear fire risk within any storage area unless they are clear of waste. Examples include: ● grinding and cutting repairs within the storage area welding or brazing of metalwork within the storage area ● smoking ● parking of normal road vehicles except while unloading or loading ● recharging forklift truck or power tool batteries	Yes - permit to work in place covering hot works	n/a
Section 4.3 - DSEAR			
Item 1	You should assess areas of the site where explosive atmospheres could occur (for example, ELV depollution bays). Where appropriate, you must classify these into hazardous zones, following the Dangerous Substances and Explosive Atmospheres Regulation 2002 (DSEAR).	Yes - DSEAR assessment completed.	n/a
Section 4.4 - Battery storage			
Item 1	You must check for damage and the chemistry type of any batteries: ● produced through depollution activities on site ● accepted as discrete loads You must do this before allocating them to the storage area.	Yes	n/a
Item 2	You must isolate damaged batteries from other batteries.	Yes	n/a

Item 3	You must store batteries in either appropriate weatherproof containers, or in appropriate containers within a building.	Yes	n/a
Item 4	You must store: ● lead acid batteries upright with terminals taped off or capped in acid proof containers to prevent leaks and short circuits ● nickel metal hydride (Ni-MH) batteries in a way that will prevent them being damaged	Yes	n/a
Item 5	You must not mix batteries of incompatible chemistries, for example lead acid batteries with Ni-MH batteries.	Yes	n/a
Item 6	You must store Li-ion batteries from electric vehicles separately from other batteries. You must store them in a way that prevents them from: ● coming into contact with any liquids ● being damaged ● being exposed to high temperatures	Yes	n/a
Section 5 – Waste Treatment Appropriate Measures			
Section 5.1 – General Waste Treatment			
Item 1	Waste treatment must have a clear and defined benefit. You must fully understand, monitor and optimise the waste treatment process to make sure you treat waste effectively and efficiently. You must not treat waste to deliberately dilute it.	The shredding facility will allow the shredding of secondary lithium-ion (Li-ion) and primary lithium batteries so that they are rendered safe for transport prior to TFS shipment to Veolia's facility in Metz, France, for material separation and metal recovery.	n/a
Item 2	The treated output material must meet your expectations and be suitable for its intended disposal or recovery route.	Yes	n/a
Item 3	You must identify and characterise emissions from the process and take appropriate measures to control them at source.	Yes, emissions via air and water will be risk-assessed. Fugitive emissions will be prevented as much as practicable.	n/a

Item 4	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 flow sheets 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 physical treatment processes, for example shredding, separation, compaction 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 undergoing the process ● the control system and how it incorporates environmental monitoring information ● process flow diagrams (schematics) ● venting and emergency relief provisions ● a summary of operating and maintenance procedures ● process instrumentation diagrams	Yes, summarised in this permit application	n/a
Item 5	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 include: ● unexpected releases ● start-up ● momentary stoppages ● shut-down ● deflagrations	Yes	n/a
Item 6	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. Material flow analysis considers the contaminant quantity in the: ● waste input ● different waste treatment outputs ● waste treatment emissions	Yes	n/a

	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. See also the section on POPs (5.3). The use of material flow analysis is risk-based and should consider: ● the hazardous properties of the waste ● the risks posed by the waste in terms of process safety ● occupational safety and environmental impact ● knowledge of the previous waste holders 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.		
Item 7	You must not proceed with the treatment if your risk assessment or material flow analysis show that losses from a process will cause: ● the breach of an environmental quality standard ● the breach of a benchmark ● a significant environmental impact	Yes	n/a
Section 5.2 - Metal shredding plant and downstream processes			
Item 1	The metal shredding plant and downstream plant and processes must be specifically designed, commissioned and operated to be fit for purpose.	Yes	n/a
Item 2	The designs need to consider physical hazards and include an assessment of the environmental risks and emissions from the plant and processes. They also need to consider prevention and protective measures and process management, such as: ● working instructions ● staff training ● appropriate process control measures ● monitoring systems, alarms and interlocks ● plant maintenance ● checks ● audits ● emergency procedures	Yes, to be developed during the commissioning stages	n/a

	If you treat small mixed WEEE or large domestic appliances you must comply with the requirements of Waste Electrical and Electronic Equipment (WEEE) guidance. We are producing further guidance on appropriate measures for permitted WEEE facilities.		
Item 3	You must process shredder non-metallic fractions under cover. You may use a range of separation technologies to further segregate and purify shredded fractions. Examples include: ● air classification ● all-metal separator ● electromagnetic separation of non-ferrous metals ● manual separation ● magnetic separation ● density separation ● vibration tables either at the shredding facility or elsewhere	Dismantling of batteries will take place under cover prior to shredding. The shredded batteries will not be further treated at the Facility. Treatment of the shredded material will take place at Veolia's Facility in France	Industrial (EV) Li-ion and Li batteries will be discharged of the remaining electrical energy and dismantled into cell or module level. The level of dismantling will depend on the structure of the battery pack, modules, and cells (cylindrical, pouch or prismatic). All recyclable materials associated with the battery pack, such as aluminium cases, copper, electronics and cardboard packaging will be segregated prior to shredding and stored prior to off site recovery.
Item 4	You must sample and analyse the fractions produced by these treatment processes to accurately classify and code the waste. You should do this in accordance with the waste classification guidance.	Yes	n/a
Item 5	You must not use a waste code for a single material fraction, such as plastic, unless the process is specifically aimed to produce that single fraction. Contamination by other materials must be negligible.	Yes	n/a
Item 6	You must also fully characterise and classify process solutions and washings from density separation processes before determining suitable disposal options.	Yes	n/a
Section 5.3 - POPs			

Item 1	You must assess fractions containing plastic (including process solutions and washings from density separation processes) for POPs.	Yes - plastic waste will be assessed for POPs and incinerated if POPs are present.	n/a
Item 2	You must treat any POPs waste as required by article 7 of Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on POPs. This means the treatment must make sure the POP content is destroyed, or irreversibly transformed. An example would be by incineration or similar thermal treatment. You must not recycle this plastic.	Yes - plastic waste will be assessed for POPs and incinerated if POPs are present.	n/a
Item 3	You must therefore assess plastic containing fractions at each stage in the treatment process to establish whether the threshold is exceeded. See further information on identifying and disposing of POPs contaminated waste.	Yes - plastic waste will be assessed for POPs and incinerated if POPs are present.	n/a
Separating POPs waste from non-POPs waste			
Item 4	You can treat any plastic that is POPs waste to separate the POPs containing fraction from the non-POPs containing plastic. For example, you can use density separation to separate plastic containing all brominated flame retardants (BFR) from that which does not. You may then recycle the non-BFR plastic (provided it does not contain any other POP) but you must destroy or irreversibly transform the BFR plastic.	Yes - plastic waste will be assessed for POPs and incinerated if POPs are present. separation may be undertaken if feasible.	n/a
Item 5	You must fully characterise and classify the following (including for POPs) before deciding on suitable disposal options: ● process solutions and washings from density separation processes ● solid fractions produced by any process	Yes - plastic waste will be assessed for POPs and incinerated if POPs are present.	n/a
Section 5.4 - Antimony trioxide			
Item 1	Antimony trioxide has been widely used as a synergist with a range of BFRs. It is present in some plastics at concentrations which exceed the hazardous waste threshold. You must therefore consider antimony trioxide when you are classifying any plastic containing fraction.	Yes - plastic waste, if contaminated with POPs or antimony trioxide will be incinerated	n/a
Section 5.5 - Minimising diffuse emissions from the process			

item 1	You must minimise the release of diffuse emissions to air from activities which may create them, for example shredding or granulating. You must do this by: ● carrying out the activity using enclosed equipment or in a closed building ● maintaining the enclosed equipment or building under an appropriate pressure ● collecting and directing the emission to an appropriate abatement system ● using a shredder system with water or foam injection into the mill	Yes - shredding batteries with water spray.	n/a
item 2	To track and control changes to processes, you must have a written procedure for proposing, considering and approving changes to both: ● technical developments ● procedural or quality changes to the plant and processes	Yes	n/a
item 3	Where you expect an emission, you must enclose all treatment plants and only vent to air using an appropriate scrubbing and abatement system (subject to deflagration relief).	Yes - activated carbon scrubbing system	n/a
Section 5.6 - Record keeping for all treatment residues			
item 1	You must record in the computerised waste tracking system: ● that a waste has been treated ● what the treatment residues are and their weight ● what end-of-waste products have been made and their weight	Yes	n/a
Section 6 – Emissions Control Appropriate Measures			
Section 6.1 – Point source emissions to air			
Item 1	You must contain storage tanks, silos and waste treatment plant (including shredders) to make sure you collect, extract and direct all process emissions to an appropriate abatement system for treatment before release.	Yes, the facility will collect air emissions from the shredder and associated equipment as well as from the shredded battery drying areas (internal and external)	n/a
Item 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.	Yes	n/a

Item 3	You must assess the fate and impact of the substances emitted to air, following the Environment Agency's risk assessment methodology.	Yes, see the H1 risk Assessment as part of this permit application	n/a
Item 4	To reduce point source emissions to air (for example, dust, VOCs and odour) from waste treatment, you must use an appropriate combination of abatement techniques, including one or more of the following systems: ● cyclonic filtration ● fabric filters ● wet scrubbing ● high efficiency particulate (HEPA) filter	Yes, the facility will utilise a wet scrubber and activated carbon	n/a
Item 5	You must assess and design vent and stack locations and heights to make sure dispersion capability is adequate.	Yes	n/a
Item 6	Where monitoring is required, you must install suitable monitoring points. Monitoring points will be required to meet MCERTS standards. You can find further guidance in the Environment Agency's M1 – Guidance on sampling requirements for monitoring stack emissions.	Yes	n/a
Item 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	Yes	n/a
Section 6.2 - Fugitive emissions to air (including odour)			
Item 1	You must use appropriate measures to prevent emissions of dust, mud and litter and odour. See our guidance on suggested appropriate measures to control dust, mud and litter and to control odour.	Yes	n/a
Item 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 ● conveyors ● skips or containers ● building fabric, including doors and windows ● pipework and ducting	Yes	n/a

Item 3	You must minimise the number of potential diffuse dust and particulates emission sources, using a combination of the following: ● limiting the drop height of material ● using wind barriers ● covering conveyor belts, including enclosure of transfer points ● fitting spray nozzles or rubber flaps to the inlet and outlet of the shredder mill ● using misting systems and wind barriers in areas with significant dust formation ● venting pipe work and ducting to an appropriate abatement system to prevent fugitive emissions	Yes, where applicable	n/a
Item 4	To make sure fugitive emissions are collected and directed to appropriate abatement, your treatment plant must use high integrity components (for example, seals or gaskets).		
Item 5	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. Examples could include gas cylinders, items concealed in baled waste, or poorly depolluted ELVs. When you identify any of these wastes you must: ● take appropriate, risk assessed measures to prevent and control emissions ● prioritise their treatment or transfer	Yes	n/a
Storage of odorous or dusty wastes			
Item 6	Where necessary, to prevent fugitive emissions to air from storing and handling odorous or dusty wastes, you should use a combination of the following measures (7 to 13).	Yes, although incoming waste is unlikely to be dusty or odorous. Shred material is unlikely to be dusty	n/a
Item 7	You should store and handle the waste within an enclosed building including: ● light fractions of the shredder residue ● dust derived from sweeping the waste treatment and storage areas ● dust derived from the abatement equipment	Yes	n/a
Item 8	You should use fully enclosed material transfer and storage systems and equipment, for example: ● conveyors ● hoppers ● containers ● tanks and skips	Yes	n/a

Item 9	You should keep enclosed buildings and equipment under adequate negative pressure with an appropriate abated air circulation and extraction system. Where possible, locate air extraction points close to potential emissions sources.	Yes, where applicable	n/a
Item 10	You should: ● use fast-acting or 'airlock' doors that default closed ● dampen potential sources of diffuse dust emissions (such as the shredder inlet and outlet, traffic areas and open handling processes) with water or fog	Yes, where applicable	n/a
Item 11	You must fully enclose and contain pre- and post-treatment shredder plant to prevent emissions.	Yes	n/a
Item 12	You must design and operate the shredder plant using appropriate process interlocks. The plant should not operate unless it is enclosed and contained, for example, only working when the loading door on the hopper is closed or sealed.	Yes	n/a
Item 13	You must contain and extract dust emissions from the shredder plant to an appropriate abatement system, for example HEPA air filtration.	Yes, wet scrubber and carbon filters	n/a
Item 14	Where ambient dust monitoring is required it must be carried out by MCERTS qualified staff.	n/a for this operation	n/a
Item 15	You must use monitoring equipment that meets as a minimum the MCERTS Performance Standards for Indicative Ambient Particulate Monitors. You must calibrate the equipment following the manufacturer's recommendations and it must be capable of providing representative data that accurately reflect PM10 levels produced operations at the site.	n/a for this operation	n/a
Item 16	Where a dust management plan is required, you must develop and implement it following our guidance.	Yes, if required	n/a
Maintaining and cleaning			
Item 17	You must set up a leak detection and repair programme and use it to promptly identify and mitigate any fugitive emissions from treatment plant and associated infrastructure (for example, pipework, conveyors, tanks).	Yes	n/a
Item 18	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.	Yes	n/a
Item 19	Your maintenance and cleaning schedules must make sure that tanks and plant are regularly cleaned to avoid large-scale decontamination activities.	Yes	n/a

Item 20	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	Yes	n/a
Item 21	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.	Yes	n/a
Item 22	If you wash out drums or containers, you must design and operate the washing process and associated equipment in a way that prevents fugitive emissions to air. For example, you could carry out this activity in a contained or enclosed system.	n/a for this operation	n/a
Odorous wastes			
Item 23	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.	Yes, although incoming waste is unlikely to be dusty or odorous. Shred material is unlikely to be odorous	n/a
Item 24	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 to treat odorous emissions.	Yes	n/a
Item 25	You must monitor 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.	n/a for this operation	n/a
Item 26	Contaminated waters have potential for odours. You must store them in covered or enclosed tanks that are vented to abatement systems, or store them in containers.	Yes	n/a
Item 27	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 If you use methods that are not covered by EN standards (for example, estimating odour impact), you should use ISO, national or other international standards to make sure you use	n/a for this operation	n/a

	data of an equivalent scientific quality. You must set out the monitoring frequency in the odour management plan.		
Item 28	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 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 sources, to characterise the contributions of the sources and to implement prevention and reduction measures	n/a for this operation	n/a
Item 29	Where an odour management plan is required, you must develop and implement it following our odour management guidance.	Yes, if required	n/a
Deflagration management			
Item 30	To prevent deflagrations and to reduce emissions where deflagrations have occurred, we may require a deflagration management plan. This should include: ● a deflagration reduction programme designed to identify the source, and to implement measures to prevent deflagrations, for example, inspecting waste input and removing dangerous items such as gas cylinders and undepolluted ELVs ● a review of historical deflagration incidents and remedies and sharing deflagration knowledge ● a protocol for responding to deflagration incidents	Yes, if required	n/a
Item 31	You must also have one or both of the following: ● pressure relief dampers, to relieve pressure waves from deflagrations that may otherwise cause damage and subsequent emissions ● pre-shredding – a low speed shredder installed upstream of the main shredder	Yes, if required	n/a
Item 32	Where there are a large number of deflagration incidents at a site, and other measures taken do not reduce the number, we may require you to install a pre-shredder.	Yes, if required	n/a
Section 6.3 – Emissions of Noise and Vibration			
Item 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.	Yes, although the operation is unlikely to cause noise issues.	n/a

		Discharge equipment, shredder plant and initial drying bays all located within a building	
Item 2	You must use appropriate measures to control noise, including for example: ● adequately maintaining plant or equipment parts which may become more noisy as they deteriorate – for example, 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 – for example, noise reducers or attenuators, insulation, or sound-proof enclosures ● including pressure relief control on shredder plant enclosures to take account of possible deflagration incidents	Yes	n/a
Item 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 your 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	Yes, if required	n/a
Item 4	The noise and vibration management plan should also include a noise and vibration reduction programme designed to: ● identify the source(s) of noise and vibration ● measure or estimate noise and vibration exposure ● characterise the contributions of the sources ● implement prevention and reduction measures	Yes, if required	n/a
Item 5	Where a noise management plan is required, you must develop and implement it following our noise management plan guidance. This guidance also has information about noise and vibration risk assessments.	Yes, if required	n/a

Section 6.4 – Point Source Emissions to Water and Sewer			
Item 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.	Yes	n/a
Item 2	You must assess the fate and impact of the substances emitted to water and sewer, following the Environment Agency's risk assessment guidance.	Yes, see the H1 risk Assessment as part of this permit application	n/a
Item 3	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 ● vehicle washing ● vehicle oil and fuel leaks ● washing of containers ● spills and leaks in waste storage areas ● loading and unloading areas ● uncovered storage areas	Yes	n/a
Item 4	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, physical separation ● physico-chemical treatment – for example, adsorption, precipitation, chemical oxidation or reduction ● solids removal – for example, coagulation, sedimentation, filtration or flotation	Yes, the facility will use a combination of filtration and pH adjustment	n/a
Section 6.5 – Fugitive Emissions to Land and Water			
Item 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.	Yes	n/a
Item 2	You must have these in all operational areas of the facility: ● an impermeable surface ● spill containment kerbs ● sealed construction joints ● a sealed drainage system	Yes, the facility is entirely concreted with a sealed drainage system	n/a

Item 3	The sealed drainage system must contain all surface water run off and channel it to a blind sump unless you can lawfully discharge it.	Yes	n/a
Item 4	You must collect and treat separately each water stream generated at the facility. For example, surface run-off water or process water. You must base separation on pollutant content and the treatment required. In particular, you must make sure you segregate uncontaminated water streams from those that require treatment.	Yes, process water and yard runoff will be collected and managed separately.	n/a
Item 5	You must use suitable drainage infrastructure to collect surface drainage from areas of the facility where you store, handle and treat waste. Drainage must be effective to make sure waste is not stored or treated in standing water.	Yes	n/a
Item 6	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	Yes, all 3 options will be considered.	n/a
Item 7	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.	Yes	n/a
Item 8	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	Yes, 3 storage tanks will allow for adequate process water collection and storage.	n/a
Item 9	You must have appropriate measures in place to monitor, treat and reuse the water held in the buffer storage before discharging.	Yes	n/a
Item 10	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	Yes, where applicable	n/a

Item 11	Where relevant, you must have measures to prevent pollution from the on-site storage, handling and use of oils and fuels. See the guidance on oil storage regulations for business.	Yes	n/a
Spill response plan			
Item 12	You must produce and implement a spillage response plan and train staff to follow it and test it.	Yes	n/a
Item 13	Your procedures and associated training must make sure you deal with spillages immediately.	Yes	n/a
Item 14	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.	Yes	n/a
Item 15	You must stop spillages from entering drains, channels, gullies, watercourses and unmade ground. You must make available absorbent materials, sand or drain mats for use when required.	Yes	n/a
Designing and maintaining surfacing and subsurface structures			
Item 16	You must make sure your spillage response plan includes information about how to recover, handle and correctly dispose of waste produced from a spillage.	Yes	n/a
Item 17	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, see the list of hazardous substances ● 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	Yes, where applicable	n/a
Item 18	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	Yes	n/a

	● construction materials ● permeability ● resistance to chemical attack ● inspection and maintenance procedures		
Item 19	You must have an inspection and maintenance programme for impermeable surfaces and containment facilities.	Yes	n/a
Tanks and bunding			
Item 20	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% of the largest tank or 25% of the total tankage, whichever is the larger ● have regular visual inspections – any contents must be pumped out or otherwise removed under manual control after checking for contamination ● be fitted with a high-level probe and an alarm (as appropriate) if not frequently inspected ● have tanker connection points within the bund (where possible), otherwise provide adequate containment ● have programmed engineering inspections – normally visual, but extending to water testing if structural integrity is in doubt ● be emptied of rainwater regularly to maintain their containment capacity You can find further guidance in Construction Industry Research and Information Association (CIRIA) Containment systems for the prevention of pollution (C736F)	Yes, where appropriate	n/a
Section 7 - Emissions Monitoring and Limits Appropriate Measures			
Section 7.1 – Emissions to Air			
Item 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	Yes	n/a

	● 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		
Item 2	Monitoring locations must meet MCERTS standards. Monitoring must use MCERTS qualified accredited methods and be done by MCERTs certified staff. You can find further guidance in the Environment Agency's M1 – Guidance on sampling requirements for monitoring stack emissions.	Yes	n/a
Section 7.2 – Emissions to Water or Sewer			
Item 1	You must apply the following emission limits and monitoring requirements for point source emissions to air.	Yes	n/a
Item 2	You must comply with any other emission limits or monitoring requirements set in your environmental permit. There may be situations where we set lower emission limits for the following substances listed.	Yes	n/a
Dust emissions			
Item 3	You must make sure dust monitoring is done every 6 months using method BS EN 13284-1. The emission limits are as follows. When using: ● fabric filters – 5 mg/m3 ● other abatement techniques – a higher emission limit of 10 mg/m3 may be appropriate	n/a for this operation	n/a
Item 4	You must report results as the average value of 3 consecutive measurements of at least 30 minutes each. The 3 consecutive measurements must be representative of the dust and particulate emissions from the operations at the site.	n/a for this operation	n/a
Other point source emissions to air			
Item 5	You must apply the following emission limits and monitoring requirements for point source emissions to air where they are relevant, based on your facility's emissions inventory and environmental risk assessment.	Yes	n/a
Item 6	You must also comply with any other emission limits or monitoring requirements set in your environmental permit. **BFRs**	Yes	n/a

	You should: ● do annual monitoring ● report results as the average value of 3 consecutive representative measurements of at least 30 minutes each **Dioxin-like polychlorinated biphenyls** Where these are identified in your inventory of point source emissions to air you should: ● do annual monitoring following standard EN1948-4 ● report results from one sampling period of at least 6-8 hours **Metals and metalloids except mercury** Where these are identified in your inventory of point source emissions to air you should: ● do annual monitoring following standard EN14385 ● report results as the average value of 3 consecutive representative measurements of at least 30 minutes each **Polychlorinated dibenzo-p-dioxin/furan(s)** Where these are identified in your inventory of point source emissions to air you should: ● do annual monitoring following standard EN1948-1 Parts1, 2 and 3 ● report results from one sampling period of at least 6-8 hours **Total VOCs** You should: ● do 6-monthly monitoring following standard BS EN 12619 ● report results as the average value of 3 consecutive representative measurements of at least 30 minutes each		
Section 7.3 - Emissions to water or sewer			
Item 1	Your facility's emissions inventory must include information about the relevant characteristics of point source emissions to water or sewer, such as: ● average values and variability of flow, pH, temperature, and conductivity	Yes	n/a

	● average concentration and load values of relevant substances and their variability – for example, chemical oxygen demand (COD) and total organic carbon (TOC), nitrogen species, phosphorus, metals, priority substances or micro pollutants ● data on bio-eliminability – for example, biological oxygen demand (BOD), BOD to COD ratio, Zahn-Wellens test, biological inhibition potential, for example, inhibition of activated sludge		
Item 2	For relevant emissions to water or sewer identified by the emissions inventory, you must monitor key process parameters (for example, waste water flow, pH, temperature, conductivity, or BOD) at key locations. For example, these could be at one of the following, the: ● inlet or outlet (or both) of the pre-treatment ● inlet to the final treatment ● point where the emission leaves the facility boundary	Yes	n/a
Item 3	You must comply with any other emission limits or monitoring requirements set in your environmental permit. We may set lower emission limits for the parameters that follow.	Yes	n/a
Hydrocarbon oil index			
Item 4	In addition to any other parameters specified by your permit, you must monitor the following emissions to water: **Hydrocarbon oil index** You must comply with the following: ● monthly monitoring following EN ISO-9377-2 ● the emission limit for metal is 10mg/l whether direct or indirect (to water body or to sewer) ● if you discharge directly to a water body, you must monitor TOC or COD – TOC is the preferred monitoring parameter **TOC** You must comply with the following: ● monthly monitoring following EN1484 ● an emission limit of 60mg/l **COD** You must comply with the following;	Yes, where applicable for indirect discharges	n/a

	● monthly monitoring ● an emission limit of 180 mg/l **Total suspended solids (TSS)** If you discharge directly to a water body: ● you must monitor TSS monthly in accordance with EN 872 ● the emission limit is 60 mg/l		
Item 5	If your waste water emissions inventory identified the following parameters are relevant, then you must monitor for them. You should monitor them monthly. There are various standards available for these parameters (for example, EN ISO 11885, EN ISO 17294-2, EN ISO 15586). These emission limits apply whether the discharge is to a water body or to the sewer: ● arsenic (As) – emission limit 0.05 mg/l ● cadmium (Cd) – emission limit 0.05 mg/l ● chromium (Cr) – emission limit 0.15 mg/l ● copper (Cu) – emission limit 0.5 mg/l ● nickel (Ni) – emission limit 0.5 mg/l ● lead (Pb) – emission limit 0.3 mg/l ● zinc (Zn) – emission limit 2 mg/l ● mercury (Hg) – emission limit is 5 ug/l (SORT microgram) and the relevant standards are EN ISO 17852, EN ISO 12846) **Perfluorooctanoic acid and perfluorooctanesulphonic acid** You should monitor 6-monthly. There is no EN standard available for the monitoring and no emission limit has been set.	Yes	n/a
Section 8 - Process Efficiency Appropriate Measures			
Section 8.1. Energy Efficiency (installations only)			
Item 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 the waste streams you treat ● set annual key performance indicators – for example, specific energy consumption (expressed in kWh/tonne of waste processed)	Yes - ISO14001 certifications and proactive energy management	n/a

	● plan regular improvement targets and related actions		
Item 2	You must regularly review and update your energy efficiency plan as part of your facility's management system.	Yes - ISO14001 certifications and proactive energy management	n/a
Item 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.	Yes - ISO14001 certifications and proactive energy management	n/a
Item 4	You must regularly review and update your energy balance record as part of your facility's management system, alongside the energy efficiency plan.	Yes - ISO14001 certifications and proactive energy management	n/a
Item 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	Yes - motors, drives and lubrication	n/a
Item 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 timers and sensors)	Yes - no heated water or air on site. Building are unheated except for trace heating on pipework.	n/a
Item 7	You should implement additional energy efficiency measures at the facility as appropriate, following our guidance.	Yes	n/a
Section 8.2. - Raw Materials (installations only)			

Item 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.	Yes - only sodium hydroxide for pH balancing of shred water	n/a
Item 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.	Yes - ongoing review	n/a
Item 3	You must justify the continued use of any substance for which there is a less hazardous alternative.	Yes	n/a
Item 4	You must have quality assurance procedures in place to control the content of raw materials.	yes - ISO 9001 certification	n/a
Section 8.3. – Water Use (installations only)			
Item 1	You must make sure you optimise water consumption to: ● reduce the volume of waste water you generate ● prevent or, where that is not practicable, reduce emissions to soil and water You must take these measures: ● implement a water saving plan (involving establishing water efficiency objectives, flow diagrams and water mass balances) ● optimise the use of washing water (for example, dry cleaning instead of hosing down, using trigger control on all washing equipment) ● recirculate and reuse water streams within the plant or facility, if necessary after treatment ● reduce the use of water for vacuum generation (for example, using liquid ring pumps with high boiling point liquids) where relevant ● reuse in a closed circuit water injected into the mill ● collect run off water and damping water for dust suppression	yes - ISO14001 certification. Considering rain water harvesting from roof area. Shred water will be reused whilst ensuring it does not develop a low flash point	n/a
Item 2	You must regularly review your water use (a water efficiency audit), at least every 4 years.	yes - ISO14001 certification.	n/a
Item 3	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	yes - ISO14001 certification.	n/a

	● have a timetabled improvement plan for implementing additional water reduction measures		
Item 4	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	Yes - shred water will be reused where possible.	n/a
Item 5	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.	Yes - clean roof water is kept separate from yard surface water	n/a
Item 6	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.	yes - ISO14001 certification.	n/a
Item 7	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.	Yes - shred water will be reused and testing undertaken to ensure it is suitable for the shredding process.	n/a
Item 8	You must minimise the volume of water you use for cleaning and washing down by: ● vacuuming, scraping or mopping rather than hosing down ● reusing wash water (or recycled water) where practicable ● using trigger controls on all hoses, hand lances and washing equipment	Yes	n/a
Item 9	You must directly measure fresh water consumption and record it regularly at every significant usage point, ideally on a daily basis.	Yes	n/a
Section 8.4. – Waste Minimisation, Recovery and Disposal			
Item 1	You must have and implement a residues management plan that: ● minimises the generation of residues 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	Yes	n/a
Item 2	Where you must dispose of waste, you must do a detailed assessment to identify the best environmental options for waste disposal.	Yes	n/a

Item 3	You must regularly review your options for recovering and disposing of waste produced at the facility. You must do this as part of the management system to make sure you are still using the best environmental options and promoting the recovery of waste.	Yes	n/a

Chemical Waste Appropriate Measures - Description		Adherence to BAT	Deviation from BAT
Section 2 – General Management Appropriate Measures			
Section 2..1 – Management System			
Item 1	You must have and follow an up-to-date, written management system that incorporates the following environmental performance 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 ● managing change ● emergency preparedness and response	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	● making sure you comply with environmental legislation You check environmental performance and take corrective or preventative 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 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 • odour management plan, if required • noise and vibration management plan, if required • dust management plan, if required • pest management plan, if required • fire prevention plan, if required • climate change risk assessment, if required Your management system can also include, for example, product or service quality, operational efficiency and health and safety in the workplace.		
Section 2.2 – Staff Competence			
item 1	Your site must be operated at all times by an adequate number of staff with appropriate qualifications and competence.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 2	The design, installation and maintenance of infrastructure, plant and equipment must be carried out by competent people.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 3	You must have appropriately qualified managers for your waste activity who are members of a government-approved technical competency scheme.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 4	The person carrying out the technical appraisal of a waste's suitability for receipt at pre acceptance must have the minimum of a Higher National Certificate (HNC) in chemistry (or equivalent qualification). For the following wastes, technical appraisals must be carried out by a person who has had enough training to determine the suitability of the waste for the site: • asbestos • contaminated clothing and rags • 'articles', for example waste electronic equipment or batteries • contaminated wood • solid non-hazardous waste other than 'mirror entries' (where waste may be allocated to a hazardous entry or to a non-hazardous entry according to the European List of Waste)	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

item 5	If you need to sample, check (other than visually), or test a hazardous waste when you accept it, acceptance must be supervised by someone with the minimum of an HNC in chemistry (or equivalent qualification). At sites where the waste needs only a visual check, the person who receives the waste must have had enough training to be able to identify and manage any non-conformances in the load received.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 6	You must make sure that any required sample is representative of the waste and has been taken by someone technically competent to do so.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 7	Any required analysis must be done by someone with the minimum of an HNC in chemistry (or equivalent qualification).	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 8	Non-supervisory staff must be reliable and technically skilled. Their skills may be based on experience and relevant training.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 2.3 – Accident Management Plan			
item 1	As part of your written management system you must have a plan for dealing with any incidents or accidents that could result in pollution.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 2	The accident management plan must identify and assess the risks the facility poses to human health and the environment.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 3	Particular areas to consider may include: ● waste types ● vessels overfilling ● 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 overfilling) ● failure to contain firefighting water	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• making the wrong connections in drains or other systems • preventing incompatible substances coming into contact with each other • unwanted reactions and runaway reactions • checking the composition of an effluent before emission • vandalism and arson • extreme weather conditions, such as flooding or very high winds		
item 4	You must assess the risk of accidents and their 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?	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 5	In particular, you must identify any fire risks, for example from: • arson or vandalism • self-combustion, for example due to chemical oxidation • 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 • reactions between incompatible materials • neighbouring site activities • sparks from loading buckets • hot loads deposited at the site	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

item 6	The depth and type of accident risk assessment you do will depend on the characteristics of the plant and its location. The main factors to take into account 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 7	Through your accident management plan, you must also identify the roles and responsibilities of the staff involved in managing accidents. You must give them clear guidance on how to manage each accident scenario, for example, whether to use containment or dispersion to extinguish fires, or let them burn.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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 making an assessment of the harm that may have been caused by an accident and the remediation actions you will take ● test the plan by carrying out emergency drills and exercises	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 2.4 – Accident Prevention Measures			

Segregating waste			
Item 1	You must keep apart incompatible or segregated wastes and substances by their hazardous properties.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	You must segregate incompatible waste types into bays or store them in dedicated buildings. The minimum requirement is to use a kerbed perimeter and separate drainage collection. You must also have measures in place to prevent containers falling over into other storage areas.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Preventing accidental emissions			
Item 3	You must make sure you contain the following (where appropriate) and route to the effluent system (where necessary): ● process waters ● site drainage waters ● emergency firefighting water ● chemically contaminated waters ● spillages of chemicals	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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 taking into account the: ● nature of the pollutants ● effects of downstream waste water treatment ● sensitivity of the receiving environment	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Security measures			
Item 9	You must have security measures (and staff) in place to prevent: ● entry by intruders ● damage to equipment ● theft ● fly-tipping ● arson	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 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 CCTV	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Fire prevention			
Item 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 12	You must have appropriate systems for fire prevention, detection and suppression or extinction.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 13	You must have suitable procedures and provisions (such as fire resistant stores, automatic alarms and sprinklers) to store certain types of hazardous waste.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 14	Your facility must have enough water supplies to extinguish fires. You must have an alternative type of fire protection system if you store or treat any water-reactive waste, for example dry powder extinguishers	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 15	You must isolate drainage systems from flammable waste storage areas to prevent fire spreading along the drainage system by solvents or other flammable hydrocarbons.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 16	You must regularly inspect and clean your site to prevent the build-up of loose combustible material (including waste and dust), particularly around treatment plant, equipment and other potential sources of ignition.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 17	You should share and communicate accident management and fire prevention plans with your local fire and rescue service.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Other accident prevention measures			
Item 18	You must assess areas of the site where explosive atmospheres could occur and, where appropriate, classify them into hazardous zones in accordance with the Dangerous Substances and Explosive Atmospheres Regulations. Plant and equipment used in these zones must be ATEX compliant.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 19	You must maintain plant control in an emergency – use one or a combination of the following measures: ● alarms ● process trips and interlocks ● automatic systems based on microprocessor control and valve control ● tank level readings such as ultrasonic gauges, high level warnings, process interlocks and process parameters	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 20	You must: ● make sure all the measurement and control devices you would need in an emergency are easy to access and will operate in an emergency ● 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	● have procedures in place to avoid incidents due to poor communication between operating staff during shift changes and after maintenance or other engineering work		
Record keeping and procedures			
Item 21	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 ● investigate accidents, incidents, near misses and abnormal events and record the steps you take to stop them reoccurring ● 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 2.5 – Contingency Plan and Procedures			
Item 1	You must have and implement a contingency plan, which makes sure you: ● comply with all your permit conditions and operating procedures during maintenance or shutdown at your site, or elsewhere ● 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	You should have contingency procedures to make sure that, as far as possible, you know in advance about any planned shutdowns at waste management facilities where you send waste.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 3	You must make your customers aware of your contingency plan, and of the circumstances in which you would stop accepting waste from them.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 4	You should 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 5	You should not discount alternative disposal or recovery options on the basis of extra cost or geographical distance if doing so means you could exceed your permitted storage limits, or compromise your storage procedures.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 6	You must not include unauthorised capacity in your contingency plan. If your contingency plan includes using temporary storage for additional waste on your site, you must make sure your site is authorised for this storage and you have the appropriate infrastructure in place.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	**Treatment sites only** 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 maintenance regime ● include all equipment or plant whose failure could directly or indirectly lead to an impact on the environment or human health	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	● identify 'non-productive' or redundant items such as tanks, pipework, retaining walls, bunds, mobile plant, 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		
Item 8	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 and materials that fail the end-of-waste specification.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 9	Your management system must include procedures for auditing your performance against all of these contingency measures and for reporting the audit results to the site manager.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 2.6 – Plant Decommissioning			
Item 1	You must consider how you will decommission the plant at the design stage, and plan how you will minimise risks during decommissioning.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	For existing plants where potential risks are identified, you must have a programme of design improvements. These design improvements need to make sure you: ● avoid 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 ● drain and clean out vessels and pipework before dismantling ● use insulation which you can dismantle easily without dust or hazard ● use recyclable materials, taking into account operational or other environmental objectives	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 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 ● the method and resources needed to clear any on-site lagoons ● the method for closing any on-site landfills ● 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 pollution caused by site activities, and information on any remediation needed to return the site to a satisfactory state when you stop activities, as defined by the initial site condition report ● the measures proposed, once activities have definitely 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 5	You should make sure that equipment taken out of use is decontaminated and removed from the site.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 3 - Waste Pre-acceptance, Acceptance and Tracking Appropriate Measures			
Section 3.1 – Waste Pre-acceptance			
Item 1	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:	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• the source and nature of the waste • its hazardous properties • potential risks to process safety, occupational safety and the environment (for example, from odour and other emissions) • knowledge about the previous waste holder		
Item 2	When you receive a customer query, and before the waste arrives at your facility, you must obtain the following in writing or in an electronic form: • details of the waste producer including their organisation name, address and contact details • the source of the waste (the producer's business and the specific process that has created the waste) • where the holder of the waste is not the producer, details of the waste holder including their organisation name, address and contact details • information on the nature and variability of the waste production process and the waste You must also obtain (in writing or electronic form) details about the waste including: • a description • the List of Waste code (European Waste Classification (EWC) code) • its physical form • its composition (based on safety data sheets, where appropriate, or representative samples and robust laboratory analysis) • any hazardous properties • any persistent organic pollutants (POPs) present • the potential for self-heating, self-reactivity or reactivity to moisture or air • any odour • its age, that is when it first became waste • the type of packaging • an estimate of the quantity you expect to receive in each load and in a year	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	You must also obtain confirmation that the waste does not contain a radioactive source. If there is a risk of radioactive contamination you must obtain confirmation that the waste is not radioactive, unless your facility is permitted to accept such waste.		
Item 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, if ammunition or aerosol canisters are present, or mixing processes that could lead to explosion) ● corrosion caused by strong acids ● a risk of uncontrolled reactions (for example, if peroxides or strong oxidants are present, or polymerising components such as certain isocyanates) ● a risk of the evolution of gases (for example if cyanides, sulphides or dissolved gas are present)	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 4	You can verify the pre-acceptance information by contacting or visiting the producer. Dealing with staff directly involved in waste production will help to fully characterise a waste.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 5	You must obtain and analyse a representative sample of a waste if: ● the chemical composition or variability of the waste is unclear from the information supplied by the customer ● there are doubts about whether the sample analysed is representative of the waste ● you will treat the waste at your facility (this allows you to carry out tests to determine if the planned treatment will be safe and effective) Where you rely on a customer sample you must record that you have done this and the reason why the customer sample is acceptable.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 6	You may not need a representative sample where, for example, the waste is: ● asbestos ● a pure product chemical or aerosol where the chemical composition and hazardous properties are available in a REACH compliant safety data sheet ● packaged cosmetics and pharmaceuticals ● contaminated clothing, packaging or rags ● an 'article', for example batteries, lighting tubes, waste electrical or electronic equipment, end-of-life vehicles or parts of vehicles, metal waste and scrap metal ● solid non-hazardous waste (except for mirror entries when the waste composition is unknown) ● contaminated wood and roofing material ● produced in an emergency – you must not treat or offload such wastes until you have completed a full characterisation 6.1 You also may not need a representative sample if the waste is laboratory smalls in containers of less than 5 litres. Laboratory smalls generally contain pure chemical elements and compounds from laboratories or arise when laboratory stores are cleared. When drums are used for laboratory smalls, a list of the contents must be stored within the drum below the lid, or attached to the drum. Similarly for other types of packages containing laboratory smalls, a list of contents is appropriately stored within (or attached to) the packaging. Each packed drum (or other package) is then labelled with the hazard for carriage, for example under the International Carriage of Dangerous Goods by Road (ADR) treaty. You should provide packaging guidance to your customer or their intermediary if the person packing the laboratory smalls does not work for you. 6.2 You also may not need a representative sample of waste oil for treatment. Pre acceptance sampling is not critical for a waste oil treatment plant, but it would be required if the waste will be treated at a mineral oil refinery. Typically waste oil	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	comes from a large number of small volume sources, such as garages, but its composition is essentially fixed. Waste oil is any mineral-based or synthetic lubrication, or industrial oil which has become unfit for its original use. Waste oil includes: ● used combustion engine oils ● gearbox oils ● mineral lubricating oils ● oils for turbines ● hydraulic oils Waste oil contaminated with more than 50 ppm of polychlorinated biphenyls (PCBs) is not included as a waste oil. 6.3 You should obtain a representative sample of the following types of waste oil, from: ● industrial sites that do not normally produce waste oil ● other sources where chemicals and potential contaminants may be handled, for example from chemical manufacturing You should advise your customers that they must avoid contaminating waste oil. This is because during treatment low flashpoint solvents or petrol will cause handling difficulties, increase volatile organic compound (VOC) emissions and increase the risk of accidents. Contamination with PCBs can transfer those PCBs either to the: ● product (which may cause dioxin formation if used in a subsequent combustion process) ● tank bottom oil sludges ● effluent		

	If you suspect that waste oil has become contaminated, for example by solvents, petrol or PCBs, you must identify the contamination. 6.4 If you do not take a pre-acceptance sample of any hazardous waste you must record the reason. 6.5 If the customer has a number of containers holding the same waste, you can apply 'the square root of (N) + 1' rule to sampling those containers. Producing a composite sample of this waste may be appropriate. If the waste is variable you will need a sample from each container.		
Item 7	After fully characterising a waste, you must technically assess the waste's suitability for treatment or storage to make sure you can meet permit conditions. You must also do this to meet any Control of Major Accident Hazards (COMAH) requirements, because wastes, raw materials and end-of-waste materials all contribute to COMAH limits. You must make sure that the waste complies with the site's treatment capabilities. In the case of water based liquid waste, you may perform laboratory scale tests to predict the treatment's performance, for example on breaking of emulsion or biodegradability.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 8	You can use material flow analysis to help identify the flow and fate of the components in the waste. This analysis can be helpful in choosing the most appropriate forms of treatment for the waste, either directly at the site or at any subsequent treatment site.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 9	You must keep pre-acceptance records for at least 3 years (in a computerised waste tracking system) 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 10	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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	In all cases, you must reassess the information required at pre-acceptance on an annual basis.		
Item 11	You must apply odour criteria to decide whether to accept wastes that are already releasing, or have the potential to release: ● mercaptans or other VOCs ● low molecular weight amines ● acrylates ● other similarly highly odorous materials These substances are only suitable for acceptance under special handling requirements.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 12	You must keep the roles and responsibilities of sales staff and technical staff separate. If sales staff are involved in waste enquiries then technical staff must do a final technical check before approval. You must keep this final technical check independent of commercial considerations, to make sure you: ● only accept wastes that are suitable for the site ● avoid accumulating waste ● have enough storage and treatment capacity	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 13	Fully characterising the waste's composition is an essential step in the pre-acceptance procedure because hazardous wastes can be very complex. You must be sure you know what is in the waste so that you can safely handle or treat it. You must select analytical tests based on knowing the process that generates the waste. You must characterise the waste's composition at the pre-acceptance stage. You need to do this to make sure you comply with regulatory requirements and to work out the most appropriate waste storage, transfer or treatment route.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 14	For liquid waste, any or all of the following may be appropriate: ● measure the density of the sample ● measure the water content ● measure the ash content after calcination at 550°C ● test whether the stream might inhibit biological treatment ● test for cyanide, and if present determine the free and complexed cyanide levels ● test for POPs ● check the content of volatile and semi volatile substances ● check the mass balance of liquid waste You can also measure the pH, redox potential and electrical conductivity of liquid wastes. For pastes and oils, perform these measurements on a water extract of crude sample using a ratio of 10 l/kg of dry matter. You should mix the water with the sample in a closed container to limit exchanges with the atmosphere. You can also test for the 12 heavy metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn) and determine their levels individually and quantitatively. You may use any specific classical method of (partial) extraction of these metals. Where it is present, check specifically for chromium (VI). If the waste is saline (conductivity > 0.15 S/m), measure the chlorides and preferably all the halogens that are soluble in water to make sure you correctly speciate the metals. You can also test for other metal content and other elements (for example silicon, sulphur and phosphorous).	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 15	If you suspect the analysis methods applied to a liquid sample will not extract and quantify the compounds present in any solid particles or in any separate phases, separate the sample into 2 fractions by a suitable method. For example, this could be by filtration, centrifugation or decantation. Then you can determine the mass of each fraction, and perform a comprehensive analysis of the separated liquid fraction and solid fraction, or of each phase.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 16	For solid waste, any or all of the following may be appropriate: ● measure the bulk density of the sample, without pre-treatment of the sample ● measure the water content ● measure the ash content after calcination at 550°C ● test for cyanide, and if present determine the free and complexed cyanide levels ● test for POPs ● check the content of volatile and semi volatile substances ● check the mass balance of solid waste You can also measure the pH, redox potential and electrical conductivity on a water extract of crude sample using a ratio of 10 l/kg of dry matter. You can also test for the 12 heavy metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn) and determine their levels individually and quantitatively. You may use any specific classical method of (partial) extraction of these metals. Where it is present, check specifically for chromium (VI). If the waste is saline (conductivity > 0.15 S/m), measure the chlorides and preferably all the halogens to make sure you correctly speciate the metals. You can also test for other metal content and other elements (for example silicon, sulphur and phosphorous).	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 17	When multiple immiscible phases or fractions are present in a waste, you can perform the analysis on each phase and combine them to provide the final result.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 18	Analyses must be carried out by laboratories that have robust quality assurance procedures and use recognised test methods. The EN ISO 17025 accreditation represents best practice.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 19	When you agree that you will accept waste from a customer, you should decide and record what parameters you will check at the acceptance stage. The checks could be visual (for example colour, phase, fuming), physical (for example pumpability,	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	form), chemical (for example pH range, maximum acceptable metals content) or odour based parameters. You should define the acceptable tolerance for each acceptance test result and record which of these criteria could lead to further testing, non-conformance or rejection. The person checking the waste for acceptance can also decide on their own additional parameters.		
Section 3.2 – Waste Acceptance			
Item 1	You must follow waste acceptance procedures to check that the characteristics of the waste you receive match your pre-acceptance information. 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	Your procedures should follow a risk-based approach, considering: ● the source, nature and age of the waste ● the waste's hazardous properties ● potential risks to process safety, occupational safety and the environment (for example, from odour and other emissions) ● potential for self-heating, self-reactivity or reactivity to moisture or air ● knowledge about the previous waste holder(s)	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 3	Other than in an emergency (for example, taking waste from an emergency incident clean-up), you must only receive pre-booked wastes onto site that have been adequately pre-accepted and are consistent with the pre-acceptance information.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 4	All relevant storage areas (quarantine, reception and general) and treatment processes in your facility must have physical capacity for the waste you receive. You must not receive waste if this capacity is not available. The amount of waste you receive must also comply with storage limits in your permit and the limits set under COMAH.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 5	You must visually check wastes or their packaging and verify them against pre-acceptance information and transfer documentation before you accept them on site. The extent of the initial visual check is determined by the waste type and how it is packaged.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 6	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	You must have clear criteria for non-conforming wastes including rejection of such waste. You must also have a written procedure for recording, reporting and tracking non-conforming wastes, including notifying the relevant customer or waste producer, and the regulator.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 8	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 density and volume). You must record the weight in the computerised waste tracking system.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 9	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 10	If there is a known risk of radioactive contamination, you must check the waste to determine that it does not include radioactive material, unless you are permitted to accept these materials.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 11	You must minimise the manual handling of waste. You should use mechanical unloading technologies where it is possible, safe and practicable to do so.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 12	Offloading, sampling, general storage, reception and quarantine areas must have an impermeable surface with self-contained drainage, to prevent any spillage entering the storage systems or escaping off site.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 13	The designated sampling point or reception area must be close to the laboratory or checking area and needs to be visible.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Acceptance of containerised waste			
Item 14	After you have completed the initial visual inspection and confirmatory checks, you must offload waste containers into a dedicated reception area to await detailed checks or sampling. Wastes that do not require further checking can go directly into the appropriate storage area. You must not unload wastes if you do not have enough space.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 15	All waste containers must be fit for purpose, and, where appropriate, be: ● in sound condition ● undamaged ● not corroded, if metal ● have well-fitting lids ● suitable for the contents ● with caps, valves and bungs in place and secure You must risk assess containers, particularly those made of plastic, if they have exceeded the manufacturer's use by date. You must quarantine non-conforming containers and deal with them immediately and appropriately. You must record all non-conformances.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 16	You must check, and where appropriate sample and analyse, the contents of all containers in the reception area within one working day of receipt. You must then transfer compliant containers to the relevant appropriate storage area on site.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 17	You must move non-compliant containers to a dedicated quarantine area unless you can safely store the waste in a general storage area with other compatible wastes whilst you investigate the non-conformance. You must label non-compliant containers to identify that they are quarantined. You must record the	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	non-conformance and where the waste is stored. If you use a dedicated quarantine area, you must segregate or isolate incompatible wastes. You must contain and abate wastes which are quarantined due to odour		
Item 18	Quarantine storage must be for a maximum of 5 working days. You must have written procedures for dealing with wastes you hold 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 19	Where containers hold laboratory smalls, you must open each container held in reception within one working day of receipt to check that the contents remain undamaged and that the inventory is as expected. All of the contents in each drum must be compatible. Once checked the container can be moved to the appropriate storage area. Laboratory smalls that need to be sorted must be moved to a dedicated repackaging area and repackaged immediately.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 20	You must make sure that all waste packages you receive are marked or labelled with: ● a description of the waste that also gives its chemical identity and composition ● a unique tracking system reference ● the date of arrival on site ● a hazard code or codes (using a product or transport symbol) The unique reference must allow you to track the waste and easily identify the producer of the waste.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 21	If waste containers are received shrink-wrapped on pallets, or you shrink-wrap containers, you can label the shrink wrap with all the relevant information. If a shrink wrapped load is split, you must make sure you mark or label each individual container with all the relevant information.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 22	Where bar code systems are used for labelling, the hazardous property of the waste and the date of receipt of the container must be directly visible.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 23	You should, wherever possible, keep wastes segregated in reception, to minimise the risk of incompatible materials reacting together.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Acceptance of bulk wastes			
Item 24	Bulk loads (liquid or solid) can only be offloaded after they have been fully verified as compliant. You must not accept a non-compliant bulk load for interim storage except in an emergency. Verification testing should include: ● checking consistency with the pre-acceptance information ● compatibility with the receiving vessel contents ● where appropriate, checking treatability by using laboratory scale simulation	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 25	Deliveries in a tanker must be accompanied by a ‘wash out’ certificate or a declaration of the previous load so that contamination by this route can be checked.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 26	Samples from tankers should wherever possible be taken representatively by taking a core sample from the top hatch and from a suitable gantry. You must sample from each compartment where the tanker is divided into multiple compartments. If you have to take a sample from the back valve, you must take precautions to avoid spillages.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Acceptance sampling			
Item 27	You must representatively sample all wastes, bulk or containerised (including from every container) at the acceptance stage, and carry out verification and compliance testing. You must not just rely on the written information supplied. The requirement to sample does not apply to some wastes, for example: ● pure product chemicals ● asbestos	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• contaminated clothing, packaging or rags • ‘articles’ • laboratory smalls • packaged cosmetics and pharmaceuticals • solid non-hazardous waste (except for mirror entries when the waste composition is unknown) • contaminated wood and roofing material • waste received directly from a householder • green wastes and food wastes Where a sample is not required, you must still visually check the waste is as expected and that no contrary materials are present. You must record the reason why you did not sample the waste in your computerised waste tracking system. You must empty and repack containers of contaminated clothing, packaging or rags to check for items that should not be there. You must obtain a representative sample and analyse waste oil, from: • industrial sites that do not normally produce waste oil • other sources where chemicals and potential contaminants may be handled, for example from chemical manufacturing For other waste oil you must obtain a representative sample of the waste but you do not have to analyse it unless a problem is found at the treatment plant.		
Item 28	A representative sample is one that takes account of the full variation and any partitioning of the load so you can account for worst case scenarios.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 29	You must take a sample from every container. You can make a composite sample if each of the containers making up the composite holds the same waste and the waste is known not to be variable. You must obtain a representative sample by	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	taking a core sample down to the base of the container. You must make sure you replace lids, bungs and valves immediately after sampling.		
Item 30	On-site sampling must take place under the supervision of the site's qualified staff. Where a driver arrives at the site with a sample taken elsewhere, the sample: ● must be verified as representative, reliable and obtained by a person technically competent to take it ● is only acceptable if it was taken for specific health or safety purposes	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 31	Sampling must not increase the risk of incompatible substances coming into contact with one another, for example within a sump serving the sampling point, or due to contaminated sampling equipment.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 32	You must have suitable absorbents and spill kit material available to deal with any spills.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 33	You must keep a record of the sampling regime, process and justification in your computerised waste tracking system.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 34	You should keep acceptance samples on site for at least 2 working days after you have: ● treated a waste and removed its treatment residues from the facility ● transferred a waste from your site Where you are transferring waste oil from your site you must keep acceptance samples for at least 2 working days after the waste has been treated off site. You must analyse the waste oil sample if a problem is found at the off-site treatment plant. You only need to keep samples that you did not analyse at acceptance.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 35	You must have a sampling and analysis procedure. You must design it based on the risk factors for the waste, for example: ● the type of waste (for example hazardous or non-hazardous) ● knowledge of the customer (for example waste producer) ● the impact of potential mixing or blending and the possibilities for subsequent treatment	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 36	You must check any relevant physico-chemical parameters using, for example, viscometry, infrared, chromatography and mass spectrometry.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 37	Sampling procedures must be customised for: ● bulk liquid ● bulk solids ● large and small containers or vessels (the number of samples increases with the number of containers or vessels and the variability of the waste) ● laboratory smalls	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 38	You must determine and record the following information: ● the sampling regime for each load, together with your justification for selecting each option ● where and how the sample was taken ● the capacity of the sampled vessel (for samples from drums, an additional parameter would be the total number of drums) ● the number of samples and degree of consolidation ● the operating conditions at the time of sampling	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 39	Wherever possible you should sample waste in accordance with:	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• 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. Sampling of waste materials. Guidance on the selection and application of criteria for sampling under various conditions • CEN/TR 15310-2 Characterization of waste. Sampling of waste materials. Guidance on sampling techniques • CEN/TR 15310-3 Characterization of waste. Sampling of waste materials. Guidance on procedures for sub-sampling in the field • CEN/TR 15310-4 Characterization of waste. Sampling of waste materials. Guidance on procedures for sample packaging, storage, preservation, transport and delivery • CEN/TR 15310-5 Characterization of waste. Sampling of waste materials. Guidance on the process of defining the sampling plan For more information see guidance on the classification and assessment of waste WM3.		
Testing and analysis			
Item 40	You must test each waste for acceptance according to the parameters decided at pre-acceptance, plus any appropriate additional checks. You should record the results of the tests in the computerised waste tracking system. You should note and investigate any discrepancies.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 41	Analysis of waste must be carried out by a laboratory with suitably recognised test methods. Where the waste received is hazardous, the laboratory should be on site, or routinely available at another site capable of providing test results within one working day of receipt of the waste at your site.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 3.3 – Waste Tracking			
Item 1	You must use a computerised 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 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 easily accessible.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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 ● the previous holder ● a unique reference number ● waste pre-acceptance and acceptance information ● any analysis results ● the package type and size ● the intended treatment or transfer route ● accurate records of the nature and quantity of wastes held on site, including all hazards – and identifying the primary hazards ● where the waste is located on site ● where the waste is in the designated treatment or transfer route	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• the names of staff who have taken any decisions about accepting or rejecting waste streams and who have decided on recovery or disposal options • details that link each container accepted to its consignment or transfer note • details of any non-conformances and rejections		
Item 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 • a breakdown of the waste quantities by hazardous property • an indication of where a batch or consignment of waste is located on a site plan • 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, where applicable	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 5	You must store back-up copies of computer records off site. Records must be easily accessible in an emergency.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 4 – Waste Storage, Segregation and Handling Appropriate Measures			
Item 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.	Yes, FLTs and staff trained to use suitable equipment	n/a
Item 2	Where possible, you should locate storage areas away from watercourses and sensitive perimeters (for example, those close to public rights of way, housing or	Yes	n/a

	schools). You must store all waste within the secure area of your facility to prevent unauthorised access and vandalism.		
Item 3	Where relevant, you must conform to HSE standards and in particular to: ● HSG51 Storage of flammable liquids in containers ● HSG71 Chemical warehousing: storage of packaged dangerous substances ● HSG76 Warehousing and storage: a guide to health and safety ● HSG140 Safe use and handling of flammable liquids ● HSG176 Storage of flammable liquids in tanks ● CS21 Storage and handling of organic peroxides	Yes, the site will adopt the same Veolia operating procedures as other sites storing hazardous wastes.	n/a
Item 4	You must clearly document the maximum storage capacity of your site and the designated storage areas. You must not exceed these maximum capacities. You should define capacity in terms of, for example, maximum tank or vessel capacities, tonnage and numbers of skips, pallets or containers. You must regularly monitor the quantity of stored waste on site and designated areas and check against the allowed maximum capacities.	Yes	n/a
Item 5	You must clearly mark hazardous waste storage areas and provide signs showing the maximum quantity and hazardous properties of wastes that can be stored there	Yes	n/a
Item 6	. Storage area drainage infrastructure must: ● contain all possible contaminated run-off ● prevent incompatible wastes coming into contact with each other ● make sure that fire cannot spread	Yes, the shredded battery storage areas will comprise segregated bays with dedicated drainage	n/a
Item 7	Secondary and tertiary containment systems must conform to CIRIA guidance C736 Containment systems for the prevention of pollution.	Yes, where applicable	n/a
Item 8	You must store containerised wastes that are sensitive to air, light, heat, moisture or extreme ambient temperatures under cover protected from such ambient conditions. Covered areas must have good ventilation. This applies to any such container: ● held in general storage, reception storage (pending acceptance) or quarantine ● being emptied, repackaged or otherwise managed	Yes, operation includes covered storage bays and enclosed building for the shredding process.	n/a

	For example, waste held in fibre or cardboard primary or secondary packaging should be stored under cover in a dry area and not exposed to rain or moisture. It must be kept off floors to prevent damage by damp.		
Item 9	You must store wastes in sealed metal containers under cover if they have the potential for self-heating or self-reactivity. You must monitor the containers for heat build-up. Such wastes include rags and filter materials contaminated with metal swarf, low boiling point oils or low flash point solvents	No	Shredded waste will be stored in appropriate packaging during the drying stage
Item 10	Wherever practicable you should store all other wastes under cover. Covered areas must have good ventilation. This applies to any such container: ● held in general storage, reception storage (pending acceptance) or quarantine ● being emptied, repackaged or otherwise managed Under cover storage provides better protection for containers than open air storage and minimises the generation of contaminated water. Covered storage also: ● lowers temperature fluctuations that can cause pressure build up in containers ● reduces the degradation of containers through weathering	Yes, operation includes covered storage bays and enclosed building for the shredding process.	n/a
Item 11	You must not store hazardous waste in open-topped containers. Empty open-topped containers should be kept in a building or undercover to prevent rainwater ingress.	Yes	n/a
Item 12	You must not store or hold wastes on site in vehicles or vehicle trailers unless you are receiving them or preparing them for imminent transfer (meaning that you will remove them from site within 24 hours, or 72 hours if over a weekend).	Yes	n/a
Item 13	You should pay particular attention to avoid the build-up of static electricity when you are storing or handling flammable wastes and materials. You should use leak detection systems and alarms (for example VOC alarms) and automatic fire suppression equipment based on a recorded risk assessment.	Yes	n/a

Item 14	You must provide adequate bunding of all storage areas, and containment and treatment of any water run-off.	Yes	n/a
Item 15	You must not accumulate waste. You must treat wastes, or remove them from the site, as soon as possible. Generally you should do this within one month of receipt but all wastes must be removed within 6 months of receipt. This applies even when the waste might be used as a reactant. Where a shorter time period is given in a permit condition you must comply with the permit for that waste. Where a waste is stored for longer than allowed you must inform the Environment Agency.	Yes	n/a
Item 16	All stored containers must keep the labelling they had at acceptance. If the label is damaged or no longer legible you should replace the label with that same information.	Yes. Daily inspections.	n/a
Item 17	You must handle and store containers so that the label is easily visible and continues to be legible.	Yes	n/a
Item 18	You should keep solid waste dry and avoid the dilution of hazardous waste.	Yes, all waste stored under cover	n/a
Item 19	You must keep clean rainwater and clean cooling water separate from wastes and waste waters.	Yes, yard runoff separate from storage areas	n/a
Item 20	You must keep incompatible wastes segregated so that they cannot come into contact with one another. You must store flammable wastes apart from other wastes to prevent fire spreading between them and other materials. You must use sealed drainage systems to prevent leaks and spillages contaminating other wastes.	Yes in accordance with operating procedures. Site to be designed to comply with this	n/a
Item 21	There must be pedestrian and vehicular access (for example, forklift) at all times to the whole storage area so that you can retrieve containers without removing others that may be blocking access – other than removing those in the same row.	Yes	n/a
Item 22	You must store all waste containers in a way that allows easy inspection. You must maintain safe access, with a gap of at least 0.7m between rows of bulk containers or palletised wastes.	Yes	n/a
Item 23	You must move drums and other mobile containers between different locations (or loaded for removal off site) following written procedures. You must then amend your waste tracking system to record these changes.	Yes	n/a

Item 24	You must stack bags and boxes of waste no more than 1m high on a pallet. You must not stack pallets more than 2 high.	Yes for pallets No for stacked bags and boxes	Bags and boxes >1m high are common place. No action taken if these are secure
Item 25	You must stack containers specifically designed for stacking, and no more than 2.2m high on a pallet.	Yes	n/a
Item 26	You must store all other containers on pallets. You must not stack these pallets more than 2 high, except for empty containers which can be stacked 3 high.	Yes	n/a
Item 27	Stacked bags, boxes and containers must be stable. They must be secured with, for example, banding or shrink-wrap, if required. The packages must not extend beyond (over-hang) the sides of the pallet. Any shrink-wrap used must be clear or transparent so that you can identify waste types, damaged containers, leaks or spillages and incorrectly stacked containers. You must be careful not to damage any packages during stacking.	Yes	n/a
Item 28	All waste containers must remain fit for purpose. You must check any containers (and pallets they may be stored on) daily and record non-conformances. Non-compliant containers and pallets must be made safe. You must immediately and appropriately manage any unsound, poorly labelled or unlabelled containers (for example, by relabelling, over drumming and transferring the container's contents). You must risk assess, approve and record the use of containers, tanks and vessels: ● beyond their specified design life ● where you use them for a purpose, or substances, other than the ones they were designed for	Yes	n/a
Item 29	You must not handle waste or its packaging in a way that might damage its integrity, unless it is appropriate to destroy a waste or its packaging, for example by shredding. You must not, for example, walk on or throw waste or waste packages.	Yes	n/a
Item 30	You should, where applicable and based on a recorded risk assessment, make inert the atmosphere of tanks containing organic liquid waste with a flashpoint less than 21°C. This can be done, for example, by using nitrogen gas.	n/a	n/a

Item 31	You must store asbestos waste double bagged or wrapped, in sealed, closed and locked containers. You must not store asbestos waste loose. You must not put asbestos wastes into bays or transfer it between different skips or containers. You must not use mechanical equipment, for example loading shovels, chutes and conveyors to move asbestos waste.	n/a	n/a
Item 32	You must not stack wheeled containers on top of one another. Do not stack empty wheeled containers into one another more than 2.2m high.	n/a	n/a
Item 33	All containers that need them should have a lid or bung, and the lid or bung must be closed except when the container is being sampled, having waste added into it or having waste removed from it.	n/a	n/a
Item 34	You must not stack skips containing waste. Skips containing hazardous waste must be enclosed when not being loaded or unloaded. You should store loose bulk hazardous wastes under cover.	n/a	n/a
Item 35	You can use racking systems to store waste but you must consider segregation, ability to inspect, separation and fire suppression measures. Racking systems must be designed and constructed in accordance with HSG76 Warehousing and storage.	n/a	n/a
Item 36	You must: ● contain wash waters within an impermeable area and either discharge them to foul sewer or dispose of them appropriately off site. ● prevent run-off into external areas or to surface water drains	n/a, no wash water	n/a
Item 37	You must manage waste in a way that prevents pests or vermin. You must have specific measures and procedures in place to deal with wastes that are identified as causing pests or vermin.	Yes, using external pest contractor. Waste types unlikely to attract pests.	n/a
Item 38	You must inspect storage areas, containers and infrastructure daily. You must deal with any issues immediately. You must keep written records of the inspections. You must rectify and log any spillages of waste.	Yes	n/a
Item 39	You must train forklift drivers in the handling of palletised goods, to minimise forklift truck damage to the integrity of containers and infrastructure.	Yes,use of trained personnel only	n/a

Item 40	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 normal road vehicles, except while unloading or loading • recharging batteries	Yes	n/a
Bulk storage			
Item 41	Where relevant, bulk storage systems must conform to CIRIA guidance, and in particular to: • C535 Above ground proprietary prefabricated oil storage tank systems • C598 Chemical storage tank systems - good practice • C736 Containment systems for the prevention of pollution	No bulk storage of hazardous waste in relation to this operation	n/a
Item 42	You must use tanks and associated equipment that are suitably designed, constructed and maintained. You must do a risk assessment to validate the design and operation of bulk storage systems. Before you use new tanks and equipment you must check they are working correctly. You must periodically examine and test that your tanks meet the standards set out in EEMUA Publication 231: The mechanical integrity of plant containing hazardous substances.	n/a	n/a
Item 43	You should vent bulk storage tanks and silos through suitable abatement.	n/a	n/a
Item 44	You must locate bulk storage vessels on an impermeable surface which is resistant to the material being stored. The surface must have self-contained drainage to prevent any spillage entering the storage systems or escaping off site. Impermeable surfaces must have sealed construction joints.	n/a	n/a
Item 45	You must provide bunds for all tanks containing liquids (whether waste or otherwise) which could be harmful to the environment if spilled. Bunds must meet the CIRIA C535 or C736 standard and: • be impermeable, stable and resistant to the stored materials	n/a	n/a

	● 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 calculated following the relevant CIRIA guidance ● have regular visual inspections – you must pump out or remove any contents under manual control after you have checked 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 – if not possible you must provide adequate containment for spillages or leakage ● have programmed engineering inspections (extending to water testing if structural integrity is in doubt) ● be emptied of rainwater regularly to maintain the containment capacity		
Item 46	You must control sludge build up and foam in tanks, for example by regularly sucking out the sludge and using anti foaming agents.	n/a	n/a
Item 47	You should equip storage and treatment tanks with an automatic level monitoring system and an associated alarm or trip system. These systems must be sufficiently robust (for example, be able to work if sludge and foam are present) and regularly maintained. You must fit tanks with suitable overfill protection.	n/a	n/a
Item 48	You must be able to close all connections to vessels, tanks and secondary containment via suitable valves. You must fit a valve close to the tank if you have bottom outlets, and have at least 2 isolation points in case of valve failure.	n/a	n/a
Item 49	You must direct overflow pipes to a contained drainage system (for example the relevant secondary containment) or to another vessel where suitable control measures are in place	n/a	n/a
Item 50	Tanks, pipework and fittings must be examined by a competent person, following a written scheme. The scope and frequency of examination must also be determined by a competent person. You must work out how often to carry out these internal examinations using a risk assessment approach. This should be based on:	n/a	n/a

	• tank service • maintenance history • known and potential damage mechanisms and their rates of attack You should also do intermediate external examinations. You must act on the results of the examinations and do any necessary repairs to ensure the tanks remain fit for service. You must keep the results of examinations and repairs.		
Item 51	You must have systems in place to make sure that loading, unloading and storage are safe, considering any associated risks. This can include: • having piping and instrumentation diagrams • using ticketing systems • using key locked coupling systems • having colour coded points, fittings and hoses • using specific coupling or hose sizes for certain waste transfers	n/a	n/a
Item 52	As a general rule, you must not use open topped tanks, containers, vessels or pits to store or treat hazardous or liquid wastes.	n/a	n/a
Transfer of waste into and from tankers			
Item 53	All pipes, hoses, connections, couplings and transfer lines must be fit for purpose and resistant to the wastes being stored. You must use a suitable pipework coding system (for example, RAL European standard colour coding).	n/a	n/a
Item 54	Site staff must supervise loading and unloading activities, either directly or via CCTV.	n/a	n/a
Item 55	You must make sure that transfers into and from tankers only take place after you have completed any relevant verification and compatibility testing, and then only with the approval of an appropriate chemist or manager. The approver must specify: • which batch or load of material is to be transferred	n/a	n/a

	• the receiving storage vessel • the equipment required, including spillage control and recovery equipment • any special provisions relevant to that batch or load including minimising odour and other fugitive emissions		
Item 56	You must have in place systems to prevent 'tanker drive off' (a vehicle pulling away whilst still coupled).	n/a	n/a
Item 57	You must make sure that the transfer of waste from tankers is only carried out by competent staff. You must give them enough time, so they are not under pressure to work more quickly than is deemed acceptable.	n/a	n/a
Item 58	You must have measures in place to make sure that couplings are a correct fit. This will prevent couplings from loosening or becoming detached. You should provide, maintain and clean your own couplings and hoses to guarantee their integrity and fitness. You should also: • make sure you take special care so that a coupling is able to withstand the maximum shut valve pressure of the transfer pump • maintain a sound coupling at each end of the transfer hose, even when a gravity feed system is in place, and protect the transfer hose • control potential leaks from coupling devices by using simple systems such as drip trays	n/a	n/a
Item 59	You must make sure that transfers into and from tankers only take place in bunded areas designed to contain a worst case spillage. You must have emergency storage for leaking vehicles to minimise any acute incidents caused by a seal on a tanker failing.	n/a	n/a
Item 60	You should have systems and procedures in place to make sure that wastes due to be transferred comply with the carriage of dangerous goods when they are packaged and transported.	n/a	n/a
Item 61	You must make sure that the transfer of waste from a tanker to a drum or vice versa is done in a dedicated area. A minimum of 2 trained and competent staff, working to formal written instructions, must perform the transfer. They must check any pipes and valves before and during the transfer. You must fit dip pipes with a shut-off valve to control the dispensing into containers and prevent overfilling.	n/a	n/a

Item 62	You must make a record of any spillages. You must retain spillages within the bunded areas and collect them promptly using, for example, pumps or absorbents.	n/a	n/a
Item 63	You must make sure that tankers are not used as blending or reaction vessels as this is not their designed purpose.	n/a	n/a
Item 64	You must take operational and design precautions when mixing or blending wastes, depending on the composition and consistency of the wastes (for example when vacuuming dusty or powdery wastes).	n/a	n/a
Item 65	Where you use rotary-type pumps, they must be equipped with a pressure control system and safety valve.	n/a	n/a
Item 66	You must pump sludges. Do not pour them	n/a	n/a
Item 67	When loading and offloading odorous, flammable or volatile liquids between bulk storage tanks and tankers, you must use vapour balance lines to transfer the displaced vapours from the receiving vessel to the vessel you are pumping from.	n/a	n/a
Item 68	You must follow safe operating procedures designed to reduce the risk of explosion and fugitive emissions when you transfer waste from powder tankers into silos. You must use trained and competent personnel.	n/a	n/a
Item 69	You must carry out routine maintenance to prevent failure of the plant or equipment. This may include the failure of a pump seal or the blockage of a filter pot commonly used at transfer points.	n/a	n/a
Item 70	You must continue using the waste tracking system that began at the pre-acceptance stage for the whole time waste is kept at the site.	n/a	n/a
Aerosol storage			
Item 71	You must store aerosol canisters under cover in secure, well-ventilated containers, and within caged storage areas. You must also store them in a well-vented place that is not subject to extreme temperatures or direct sunlight. You must not store canisters in open containers to prevent the risk of them spreading fires by ‘missiling’ or ‘ejection’.	n/a	n/a

Item 72	You must segregate aerosol canisters from other flammable wastes and potential sources of ignition. Preferably put them in a separate building, or use a fire resistant enclosure or fire wall. You must not hold any combustible material within the storage area, other than the canister's packaging, containers and the pallets on which they stand.	n/a	n/a
Item 73	You must provide suitable containment measures (for example drip trays) for aerosol canisters held in containers which cannot collect and hold free liquids released from the canisters. Or you should transfer them to secure containers that are able to hold free liquid	n/a	n/a
Item 74	During storage, lids on containers holding aerosol canisters must remain securely closed at all times when not being filled, emptied or internally inspected. When not in use, the doors or hatches of cages must remain closed and locked.	n/a	n/a
Item 75	You must not overfill containers used to store canisters. Overfilling can result in canisters being actuated and discharging their contents, either: ● under the weight of the canisters above them ● when the container lid is closed ● when containers are stacked	n/a	n/a
Item 76	Cages used to store aerosol canister containers must be robust, fire resistant and of an appropriate mesh size (based upon the size of the canisters being stored). This is to constrain the canisters and prevent any ejection. Where the cage is not constructed with a mesh roof, the mesh wall panels must extend into the roof space of the storage area to make sure that the structure is completely enclosed.	n/a	n/a
Item 77	You should store aluminium canisters separately from steel canisters (especially rusting canisters). This will: ● prevent thermite sparks during storage, handling and treatment ● allow the different metals to be more easily recovered	n/a	n/a

Sorting, repackaging and bulking			
Item 78	Sorting is the placing together of containers with other waste containers of the same type, without emptying the contents from the container. You must have a permit that specifically allows you to carry out storage activities (coded D15 or R13).	n/a	n/a
Item 79	Repackaging is the removal of waste from a container, or into a container. This may involve bulking it with other wastes of the same type from other containers. You must have a permit that specifically allows you to carry out repackaging activities (coded D14 or R12).	n/a	n/a
Item 80	Bulking of waste that is not regarded as repackaging includes: ● discharging from a tanker to bulk storage of wastes of the same type ● tank to tank transfer where both tanks contain wastes of the same type These activities are storage (coded D15 or R13).	n/a	n/a
Item 81	You must only bulk or repackage wastes together if they are materially the same. They must not react when they are bulked and they must not change the waste's composition.	n/a	n/a
Item 82	If a waste is mixed with other similar wastes, where the resulting mixture does not have significantly different characteristics from the mixed wastes (for example blending compatible combustible or flammable wastes as a fuel), this activity is mixing or blending (coded D13 or R12). Any other mixing that changes a waste is treatment.	n/a	n/a
Item 83	You must have a permit that specifically allows you to mix hazardous waste with any: ● non-hazardous waste ● hazardous waste in a different category ● non-waste	n/a	n/a

Item 84	You must not mix, bulk or repackage: ● wastes which could be recovered with other wastes if this means that the waste must now be sent for disposal or a lower form of recovery ● liquid wastes or infectious wastes with other wastes for the purpose of landfilling ● oils where this could affect their regeneration or recycling ● wastes containing Persistent Organic Pollutants (POPs) with another material solely to generate a mixture below the defined low POPs content ● waste to deliberately dilute it	n/a	n/a
Item 85	You must transfer wastes from containers into other storage vessels using a dip pipe, not by pouring.	n/a	n/a
Item 86	Repackaging or mixing must only take place in a dedicated area or store which has the plant and equipment needed to deal with the specific risks of that process. For example, this could include abatement or local exhaust ventilation.	n/a	n/a
Item 87	Except for small packages with a volume less than 5 litres, or damaged containers, you must move containers using mechanical means. For example, use a forklift truck with a rotating drum handling fitting, or using pumps for liquids.	n/a	n/a
Item 88	You must label containers of repackaged or mixed wastes so that you can identify their contents and origin through the tracking system. After repackaging, you must move the bulked materials and emptied containers to an appropriate segregated storage area.	n/a	n/a
Item 89	You must have a risk assessment and carry out appropriate compatibility testing to make sure that bulked wastes will not react with each other, or with the container into which they are being placed.	n/a	n/a
Laboratory smalls			
Item 90	Where possible, you should sort and segregate laboratory smalls at source so that you do not need to reopen or re-sort containers.	n/a	n/a
Item 91	If you sort laboratory smalls for compatibility reasons you must carry this out in a dedicated area of a building, with self-contained drainage.	n/a	n/a

Item 92	You must write and follow procedures for the segregation, sorting and repackaging of laboratory smalls.	n/a	n/a
Section 5 – Waste Treatment Appropriate Measures			
Section 5.1 – General Waste Treatment			
Item 1	Waste treatment must have a clear and defined benefit. You must fully understand, monitor and optimise the waste treatment process to make sure that you treat waste effectively and efficiently. You must not treat waste to deliberately dilute it. The treated output material must meet your expectations and be suitable for its intended disposal or recovery route. You must identify and characterise emissions from the process, and take appropriate measures to control them at source.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	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 chemical reactions and their reaction kinetics and energy balance ● details of physical treatment processes for example thermal desorption, distillation, phase separation, shredding, filtration, compaction, centrifuging, heating, cooling or washing ● details of biological treatment processes ● details of any effluent treatment ● 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• 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 • monitoring points and monitoring schedules		
Item 3	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 your permit. Abnormal operating conditions include: • unexpected releases • start-up • momentary stoppages • shut-down	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 4	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. Material flow analysis considers the contaminant quantity in the: • waste input • different waste treatment outputs • waste treatment emissions 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. The use of material flow analysis is risk-based, considering:	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• the hazardous properties of the waste • the risks posed by the waste in terms of process safety • occupational safety and environmental impact • knowledge of the previous waste holder(s) A treatment process may destroy certain substances in the waste. It could also put substances into the air, water or ground, or have residues which are sent for disposal. The weight of these outputs should be minimised. The treatment may produce residues for recovery or reuse and the weight of these substances should be maximised.		
Item 5	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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 6	You must clearly define the objectives and reaction (chemical, physical or biological) processes for each treatment process. You must define the end point to the process so that you can monitor and control the reaction. You must define the suitable inputs to the process, and the design must take into account the likely variables expected within the waste stream. You must sample and analyse the waste to check that an adequate end point has been reached.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	For each new reaction, you must assess the proposed mixes of wastes and reagents before treatment by carrying out a scale laboratory test mix of the wastes and reagents to be used. You must predetermine a batch ‘recipe’ for all reactions and mixes of wastes. You must also take into account the potential scale up effects, for example, the increased: • heat of reaction with increased reaction mass relative to the reactor volume	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• residence time within the reactor and modified reaction properties Your treatment must comply with HSG143 Designing and operating safe chemical reaction processes.		
Item 8	The reactor vessel and plant must be specifically designed, commissioned and operated to be fit for purpose. The designs need to consider chemical process hazards and a hazard assessment of the chemical reactions. They also need to consider prevention and protective measures and process management, such as: • working instructions • staff training • appropriate process control measures • monitoring systems, alarms and interlocks • plant maintenance • checks • audits • emergency procedures	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 9	To track and control the process of change, you must have a written procedure for proposing, considering and approving changes to technical developments or procedural or quality changes.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 10	Where an emission is expected, all treatment or reactor vessels must be enclosed. Only vent them to the atmosphere via an appropriate scrubbing and abatement system (subject to explosion relief).	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 11	You must monitor the reaction to make sure it is under control and proceeding towards the anticipated result. Vessels used for treatment must be equipped appropriately, for example with high level, pH and temperature monitors. These monitors must be automatic and continuous, linked to a clear display in the control room or laboratory, and have an audible alarm. Your risk assessment may require you to link process monitors to cut-off devices.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Section 5.2 - Aerosol Canister Treatment			
Item 1	Any aerosol treatment process must be fit for purpose. It must be specifically designed to: ● treat canisters and recover their materials and residues ● manage potentially flammable substances ● prevent explosive atmospheres	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	You must design and operate the treatment process (for example, the waste feed rate, duration of treatment cycle and gas or liquid extraction) so that the canisters' residual contents are fully discharged and removed safely and efficiently.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 3	You must locate the treatment plant in a designated covered area or ventilated building. This must: ● have impermeable surfaces and sealed drainage ● be located away from stored combustible materials, other sources of ignition and sensitive receptors You must design the treatment area to avoid the potential build-up of flammable gases that are heavier than air, for example in sumps or similar sunken areas.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 4	The treatment process must be: ● designed by a competent person ● carried out in an enclosed and sealed system, fitted with an appropriate gas extraction system ● provided with a means to contain or control an explosion	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• strong enough to contain an explosion (typically up to 10 bar over-pressure), or have explosion relief directed to a safe space or explosion suppression fitted. Design, operation and explosion relief provisions must satisfy the requirements of relevant health and safety legislation. The gas extraction system must be interlocked with plant operation, so that the plant cannot operate unless the system is working.		
Item 5	You must carry out the aerosol treatment process, including tipping and loading, within a controlled inert atmosphere. For example, you could use gas extraction and nitrogen gas injection to displace air from the plant and purge it before and after a treatment cycle. If the inerting system fails or high oxygen levels are detected, the treatment should stop automatically. Similarly, if you use ventilation to prevent an explosive atmosphere forming, the equipment should automatically stop operating when the lower explosion limit is approached.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 6	You must make sure you have checked and sorted all canisters before feeding them into the treatment process. This makes sure you exclude incompatible or untreatable wastes (for example, expanding foams).	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	You should process batches of aluminium and steel cans separately to make it easier to recycle the metals recovered from the treatment process and prevent thermite reactions.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 8	You must keep waste sorting and storage distinct and separate from the treatment process.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 9	For safety, and to prevent wastes accumulating on site, you must make sure you identify available and reliable recovery or disposal routes. You should have contracts in place to take:	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• the residues or materials recovered from the treatment process • any canisters you have accepted but cannot treat on site		
Item 10	You must make sure that as a minimum, all LPG piping systems comply with UKLPG Code of Practice 22. They must be securely sealed and tested and have a procedure in place for regular inspection.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 11	Containers and tanks holding liquids collected from the treatment process should be: • compatible with the materials held • fully earthed • UN tested • integrally sound • designed and constructed to prevent the release of fugitive emissions to air (including odour) and ground, whilst allowing for emergency venting where necessary	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 12	You should store containers that cannot be enclosed (for example skips containing recovered metal which are open to allow ventilation and drying) in well-ventilated, covered storage areas. This will prevent: • rainwater collecting (and becoming contaminated) • the materials held corroding or deteriorating	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 13	You should not collect or hold flammable liquids in plastic drums or non-conductive plastic IBCs. Containers used to collect and hold flammable liquids from the treatment process should preferably be constructed from steel, or at least anti-static plastic. They should be designed so that they can be sealed for handling and storing. You must only use anti-static plastic containers to collect and hold flammable liquids if you are holding them separate from other wastes, within a self-contained bund.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 14	You must collect, and allow to dry, any residues that remain on the recovered metals before they are stored or sent for recycling.		
Section 5.3 - Record keeping for all treatment residues			
Item 1	You must record in the computerised waste tracking system: ● that a waste has been treated ● what the treatment residues are and their weight ● what end-of-waste products have been made and their weight	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 6 – Emissions Control Appropriate Measures			
Section 6.1 – Point source emissions to air			
Item 1	You must contain storage tanks, silos and waste treatment plant (including shredders) to make sure you collect, extract and direct all process emissions to an appropriate abatement system for treatment before release.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 3	You must assess the fate and impact of the substances emitted to air, following the Environment Agency's risk assessment methodology.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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:	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• adsorption (for example, activated carbon) • biofiltration • wet scrubbing • fabric filters • high efficiency particulate (HEPA) filtration • condensation and cryogenic condensation • cyclonic separation • electrostatic precipitation • thermal oxidation		
Item 5	You must assess and design vent and stack locations and heights to make sure dispersion capability is adequate. Where monitoring is required, including for odour, you must install suitable monitoring points.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 6	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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	You should design and operate abatement systems to minimise water vapour plumes.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 6.2 - Fugitive emissions to air (including odour)			
Item 1	You must use appropriate measures to prevent emissions of dust, mud and litter and odour.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	Where that is not possible, you must minimise these emissions. Storage and treatment plant includes associated equipment and infrastructure such as: ● shredders ● conveyors ● skips or containers ● building fabric, including doors and windows ● pipework and ducting		
Item 3	To make sure fugitive emissions are collected and directed to appropriate abatement, your treatment plant must use high integrity components (for example, seals or gaskets). Your treatment plant must be fully enclosed, with air extraction systems located close to emission sources where possible.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 5	Where necessary, to prevent fugitive emissions to air from the storage and handling of wastes, you should use a combination of the following measures: ● store and handle such wastes within a building or enclosed equipment ● keep buildings and equipment under adequate negative pressure with an appropriate abated air circulation or extraction system ● where possible, locate air extraction points close to potential emissions sources ● use fully enclosed material transfer and storage systems and equipment, for example, conveyors, hoppers, containers, tanks and skips ● use fast-acting or ‘airlock’ doors that default closed	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• keep building doors and windows shut to provide containment, other than when access is required • minimising drop height • use misting systems and wind barriers to prevent dust		
Item 6	You must set up a leak detection and repair programme and use it to promptly identify and mitigate any fugitive emissions from treatment plant and associated infrastructure (for example, pipework, conveyors, tanks).	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	You must regularly inspect and clean all waste storage and treatment areas, equipment (including conveyor belts) and containers. 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 8	Your inspection, maintenance and cleaning schedules must make sure that tanks and plant are regularly cleaned to avoid large-scale decontamination activities.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 9	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 and regularly inspecting and maintaining plant.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 10	If you wash containers or tanks, you must design and operate the washing process and associated equipment in a way that prevents fugitive emissions to air. For example, you could do this activity in a contained or enclosed system.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 11	You must fully enclose and contain pre- and post-treatment shredder plant to prevent emissions. You must design and operate the shredder plant using appropriate process interlocks. The plant should not operate unless it is enclosed and contained, for example, only working when the loading door on the hopper has been closed or sealed. Dust and microbial emissions from the shredder plant must be contained and extracted to an appropriate abatement system, for example HEPA air filtration.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 12	Where a dust management plan is required, you must develop and implement it following our guidance	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 13	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 14	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 15	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 16	You must store contaminated waters that have potential for odours in covered or enclosed tanks or containers vented through suitable abatement.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 17	Where odour pollution at sensitive receptors is expected, or 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 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 18	Where odour pollution at sensitive receptors is expected, or 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 odour monitoring ● a procedure for responding to odour incidents, for example, complaints ● an odour prevention and reduction programme designed to identify the source(s), characterise the contributions of the sources and prevent and reduce them	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 19	Where an odour management plan is required, you must develop and implement it following our guidance.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 6.3 – Emissions of Noise and Vibration			
Item 1	You should design the facility so that potential sources of noise (including building exits and entrances) are away from sensitive receptors and		

	boundaries. You should locate buildings, walls, and embankments so they act as noise screens.		
Item 2	You must employ appropriate measures to control noise, for example, including: ● adequately maintaining plant or equipment parts which may become more noisy as they deteriorate – for example, 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 sources of noise – for example, noise reducers or attenuators, insulation, or sound-proof enclosures	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 3	Where noise or vibration pollution at sensitive receptors is expected, or 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 noise and vibration monitoring ● a procedure for responding to identified noise and vibration events, for example, complaints	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 4	Your 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 5	Where a noise and vibration management plan is required, you must develop and implement it following our guidance.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 6.4 – Point Source Emissions to Water and Sewer			
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	You must assess the fate and impact of the substances emitted to water and sewer, following the Environment Agency's risk assessment guidance.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 3	Discharges to water or sewer must comply with the conditions of an environmental permit or trade effluent consent. Relevant sources of waste water include: • water or condensate collected from treatment processes • waste compactor run-off • vehicle washing • vehicle oil and fuel leaks • washing of containers • spills and leaks in waste storage areas • loading and unloading areas	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 4	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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 5	You must direct wash waters from cleaning containers to a foul sewer or sealed drainage system for on-site re-use or off-site disposal. You may need to pre-treat the waters to meet any limits on the effluent discharge consent. Discharges of wash waters to surface water or storm drains are not acceptable.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 6.5 – Fugitive Emissions to Land and Water			
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	You must have these in all operational areas of the facility: ● an impermeable surface ● spill containment kerbs ● sealed construction joints	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	• a sealed drainage system		
Item 3	You must have measures in place to prevent overflows and failures from tanks and vessels, including where relevant: • overflow detectors and alarms • directing over-flow pipes to a contained drainage system • locating tanks and packaged liquids in suitable secondary containment (bunds) • providing isolation mechanisms (for example, closing valves) for tanks, vessels and secondary containment	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 4	You must collect and treat separately each water stream generated at the facility, for example, surface run-off water or process water. Separation must be based on pollutant content and treatment required. In particular you must make sure you segregate uncontaminated water streams from those that require treatment.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 5	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 wash waters and occasional spillages. Depending on the pollutant content, you must either recirculate what you have collected or send it for further treatment.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 6	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 8	You must have appropriate measures in place to monitor, treat and reuse water held in the buffer storage before discharging.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 9	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 solutions in contained areas of the site and never in areas that drain to the surface water system	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 10	Where relevant, you must have measures to prevent pollution from the on-site storage, handling and use of oils and fuels.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 11	You must produce and implement a spillage response plan and train staff to follow and test it.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 12	Your procedures and associated training must make sure you deal with spillages immediately.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 13	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 14	You must stop spillages from entering drains, channels, gullies, watercourses and unmade ground. You must make proprietary sorbent materials, sand or drain mats available.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 15	You must make sure your spillage response plan includes information about how to recover, handle and correctly dispose of waste produced from a spillage.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 16	Container washing equipment must be contained and located in a designated area of the facility that has self-contained drainage. The equipment must be designed to collect and contain all wash waters, including any spray. Trained staff must operate, inspect and maintain it regularly.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 17	For sub-surface structures, you must: ● establish and record the routing of all site drains and sub-surface 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 sub-surface structures, for example, pressure tests, leak tests, material thickness checks or CCTV	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 18	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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 19	You must have an inspection and maintenance programme for impermeable surfaces and containment facilities.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 7 - Emissions Monitoring and Limits Appropriate Measures			
Section 7.1 – Emissions to Air			
Item 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 7.2 – Emissions to Water or Sewer			
Item 1	Your facility's emissions inventory must include information about the relevant characteristics of point source emissions to water or sewer, 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 (biochemical oxygen demand), BOD to COD ratio, Zahn-Wellens test, biological inhibition potential, for example, inhibition of activated sludge	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 2	For relevant emissions to water or sewer identified by the emissions inventory, you must monitor 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 8 - Process Efficiency Appropriate Measures			
Section 8.1. Energy Efficiency (installations only)			
Item 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 do 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	You must regularly review and update your energy efficiency plan as part of your facility's management system.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 4	You must regularly review and update your energy balance record as part of your facility's management system, alongside the energy efficiency plan.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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 timers and sensors)	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	You should implement additional energy efficiency measures at the facility as appropriate, following our guidance.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Section 8.2. - Raw Materials (installations only)			
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 3	You must justify the continued use of any substance for which there is a less hazardous alternative.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 4	You must have quality assurance procedures in place to control the content of raw materials.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Section 8.3. – Water Use (installations only)			
Item 1	You must make sure you optimise water consumption to: ● reduce the volume of waste water you generate ● prevent or, where that is not practicable, reduce emissions to soil and water	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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 wash waters (for example, dry cleaning instead of hosing down and using trigger controls on all washing equipment) ● recirculating and reusing water streams within the plant or facility, if necessary after treatment	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

	● reducing the use of water for vacuum generation (for example, using liquid ring pumps with high boiling point liquids), where relevant		
Item 3	You must review water use (a water efficiency audit) at least every 4 years.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 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 ● 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 6	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 7	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.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

Item 8	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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 9	You must directly measure fresh water consumption and record it regularly at every significant usage point, ideally on a daily basis.		
Section 8.4. – Waste Minimisation, Recovery and Disposal			
Item 1	You must have and implement a residues management plan that: ● minimises the generation of residues 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	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 2	Where you must dispose of waste, you must do a detailed assessment to identify the best environmental options for waste disposal.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a
Item 3	You must regularly review options for recovering and disposing of waste produced at the facility. You must do this as part of your management system to make sure you are using the best environmental options and promoting the recovery of waste where technically and economically viable.	Refer to answers set out in the Treating Metal Waste in Shredders BAT Assessment	n/a

APPENDIX E

SITE CONDITION REPORT

Site Condition Report

Minworth Battery Reuse and Recycling Facility

Version 1

CONTENTS

Executive summary

Purpose of this report

This document is the Application Site Condition Report (SCR) for the proposed Minworth Battery Reuse and Recycling Facility located at Forge Lane, Minworth Industrial Estate, Sutton Coldfield, West Midlands, B76 1AH ('the Installation'). Veolia ES (UK) Limited proposes to adapt a previous hazardous waste treatment site, which was operational from 1993 to 2006. The site was occupied by an Industrial cleaning company before that and prior to that was a Wharf associated with the adjacent canal. An application to permit operation of the proposed Installation is being made under the Environmental Permitting Regulations (England and Wales) 2016. The activities undertaken within the Installation constitute a prescribed process for the purposes of the Regulations, as defined in Section 5.3 of Schedule 1 to the Regulations.

The Application SCR is intended to describe the condition of the land and groundwater at the point at which an application for an environmental permit is made by the operator. The Application SCR must consider the existing condition of the site through consideration of the former land-uses and pollution history of the site.

The SCR is intended to enable Veolia to demonstrate that reasonable steps to protect the land and groundwater from contamination have been undertaken during the lifetime of the Installation. The SCR is intended to be a 'live' document which is maintained throughout the lifetime of the operations at the Installation, from permit application through operation to permit surrender.

The Application SCR detailed herein has been undertaken in general accordance with Environment Agency, Guidance for Applications, H5: Site Conditions Reports (v3, April 2013). In accordance with H5 guidance Sections 1 to 3 have been completed for the permit application stage. Healthcare is required to maintain Sections 4 to 7 during the lifetime of the Installation. Sections 8 to 10 are required to be completed as part of an application to surrender the Environmental Permit. The Sections of the SCR are summarised below.

Environmental Permit Site Condition Report

Permit Application SCR:
Section 1 Introduction and Site Details
Section 2 Condition of the Land at Permit Issue
Section 3 Permitted Activities

Operational Phase:
Section 4 Changes to the Activity
Section 5 Measures Taken to Protect Land
Section 6 Pollution Incidents that may have had an Impact on Land, and their Remediation.
Section 7 Soil Gas and Water Quality Monitoring

Permit Surrender SCR:
Section 8 Decommissioning and Removal of Pollution Risk
Section 9 Reference Data and Remediation (where relevant)
Section 10 Statement of Site Condition

1.0 SITE DETAILS	
Name of the applicant	Veolia ES (UK) Limited
Activity address	Minworth Battery Reuse and Recycling Facility Forge Lane, Minworth Industrial Estate, Sutton Coldfield, West Midlands, B76 1AH
National grid reference	SP 14846 92325

Document reference and dates for Site Condition Report at permit application and surrender	Permit Application Supporting Statement (August 2023) Application Site Report - Golder Associates (August 2005).

Document references for site plans (including location and boundaries)	Permit Application Supporting Statement (August 2023): Appendix A Application Site Report - Golder Associates (August 2005).

2.0 Condition of the land at permit issue	
Environmental setting including: ● geology ● hydrogeology ● surface waters	**2.1 Geology** <u>Ground Surface</u> Within the main building, the ground surface comprises a level concrete and screed floor with no signs of cracking, there were a few signs of recent repairs to the concrete. Externally, the Installation has a reinforced concrete hardstanding which covers the entirety of the site. The concrete hardstand has a number of cracks and evidence of patching from historic repairs. Given the previous history of the site which included the following waste activities: storage, aqueous treatment (including inorganic and organic acid neutralisation processes), transfer, oil and water separation, cyanide oxidation, chromium reduction, water reactives processing and effluent treatment, there is still evidence of concrete kerbs, bund walls, low ramps and building walls. All these structures have been removed and the site surface is generally level, with the exception of shallow bunds to the east of the site. There will be a requirement for some resealing of the joints prior to the site being Operated. <u>Made Ground</u> The site is surfaced with concrete as discussed above. Samples of the Made Ground present beneath the surface cover have been collected on occasions when the concrete has been removed and replaced Some of these samples have been analysed for a limited suite of chemicals since 2000. Section 6.3 of the Golders Site Report (2005) document summarises the results. The soils beneath the site are indicated on the Groundwater Vulnerability map as being classified as ‘H2’. indicating that they are soils with a high leaching potential. They are usually deep, permeable, coarse textured soils that readily transmit a wide range of pollutants because of their rapid drainage and low attenuation potential. <u>Superficial Geology</u> The drift deposits beneath the site comprise Pleistocene River Terrace Gravels.The gravels are described on the geological map as being the 2nd terrace of the River tame. The terrace is referred to locally as the Hams Hall Terrace. Regionally, the terrace is present as laterally discontinuous outcrops that generally follow the River Tame. The site is situated on an outcrop of the gravels that covers an approximate area of 40 Ha. The gravels are likely to be thin beneath the site. River Terrace Gravels generally comprise poorly sorted sands and gravels, with minor or insignificant quantities of clay and/or silt.

Bedrock Geology

Underlying the Hams Hall Terrace, the Mercia Mudstones Group is present. The Mercia Mudstone is extensive in both its lateral and vertical extent, and is indicated on the geological map as being in excess of 100m thick. In general, the Mercia Mudstone Group comprises red mudstone, with green-grey dolomitic siltstone and sandstone beds, and beds and nodules of gypsum at depths greater than 30m below ground level.

Previous Ground Investigation

No previous ground investigation information is available for the Installation, other than infrequent samples taken by site personnel, as described earlier in this section.

2.2 Hydrogeology

Groundwater

The Hams Hall Terrace beneath the site has been classified as a Minor Aquifer. Minor Aquifers are variably permeable units that can be fractures or potentially fractured rocks that do not have a high primary permeability or other formations of variable permeability including unconsolidated deposits Although they do not produce large quantities of water for abstraction, they are important for local supplies and for supplying base flow to rivers.

The Hams Hall Terrace overlies the Mercia Mudstone Group. Given the permeable nature of the terrace deposits and the impermeable nature of the Mercia Mudstones Group, it is likely that groundwater is present as water perched on the deeper unit.

The Mercia Mudstone Group beneath the site is classified as a Non-Aquifer. Non-Aquifers are formations that are regarded as containing insignificant quantities of groundwater. It is expected that the Mercia Mudstone beneath the site will have a low permeability, and will therefore serve to prevent downward migration of potential contamination originating from the site.

Groundwater Abstractions

There are no groundwater abstractions within 1km of the Installation site, according to a search of the Environment Agency's Water resources website.

Drinking Water Safeguard Zones

According to the Environment Agency website the Installation is not within a groundwater Drinking Water Safeguard Zone.

	2.3 Hydrology <u>Surface Watercourses</u> The nearest surface water features to the site are the Birmingham and Fazeley Canal, which is located immediately adjacent to the southern boundary of the site, and the Warmley Ash Brook, which is located immediately adjacent to the western boundary of the site. The stream flows from the northwest to the southeast and is culverted beneath the canal before discharging to the River Tame, which is located approximately 1.5km south of the site. It is understood that the stream runs dry during the summer months, suggesting that it is not significantly supported by base flow from groundwater. Further from the site. a small area of surface water ponds is present approximately 600m west of the site. The ponds are labelled as Black Pool, Dragonfly Lake, Kingfisher Pool and Grey Lake and form part of Plants Brook Local Nature Reserve. Given the location of the identified surface water features in relation to the site, it is likely that regional groundwater flow would be towards the south and the River Tame. <u>Drinking Water Safeguard Zones</u> According to the Environment Agency website the Installation is not within a surface water Drinking Water Safeguard Zone. <u>Consented Activities</u> The current permit includes one discharge: S1 - emission to sewer for contaminated surface runoff. This is covered by a Trade Effluent Consent ref: 007103v with Severn Trent Water. <u>Flooding</u> The Environment Agency website reveals that the Installation is in Flood Zone 1. It has a low risk of flooding from surface water.
Pollution history including: ● pollution incidents that may have affected land ● historical land-uses and associated contaminants ● any visual/olfactory evidence of existing contamination ● evidence of damage to pollution prevention measures	**2.4 Substantiated Pollution Incident Register Records** There have been no known Substantiated Pollution Incident Register Records in relation to the existing building onsite. There were no details provided by Shanks Waste Management Ltd on pollution incidents or permit compliance during the transfer to Veolia.

2.5 Pollution Incidents to Controlled Water

There have been no known Substantial pollution incidents to controlled water in relation to the operation or operations in the immediate vicinity.

There were no details provided by Shanks Waste Management Ltd on pollution incidents or permit compliance during the transfer to Veolia.

2.6 Waste Activities

Off site activities are summarised in Table ASR6 of the Application Site Report - Golders (2005). This information suggests that the site has been surrounded by Industrial Units, including Engineering Works and Metal Works since the 1960's. There is no record of waste management facilities in the immediate area.

2.7 Previous Installation Use & Records

The site was originally permitted in 1995 (to Caird Environmental Limited, latterly Shanks Waste Management) and operated as a hazardous waste treatment facility for the following:

- Physico-chemical treatment of acidic, alkaline and contaminated water wastes in liquid, sludgy and powder form including the pre-treatment of cyanide containing wastes by chemical oxidation
- Physico-chemical treatment of oily wastes/oil contaminated water wastes in order to separate the oil fraction for subsequent recovery
- The handling of packaged waste for the purpose of treatment on site or storage pending transfer to off site recovery, treatment or disposal.

The site was cleared of all waste and infrastructure and the permit was transferred to Veolia ES (UK) Limited (Veolia) in June 2006.

The hazardous waste treatment operation was not recommissioned by Veolia and so a variation (V002) was submitted to reduce input tonnes to <5,000 tonnes. The permit was issued in April 2010.

A further variation (V004) was made to the permit in April 2012. The purpose of this variation was to enable a battery sorting facility to be developed at the site for the storage, sorting, mechanical treatment and repackaging of batteries for onward recovery and disposal. This was in response to changing market conditions and corporate strategy development.

In August 2013 an Agency-initiated variation (V005) was issued to reflect the implementation of the IED. The site has not been operational during these latest variations.

Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	**2.8 Historical land-uses and associated contaminants.** Previous Land Uses A review of the land use history of the Installation was conducted by reviewing the historical maps provided by the Envirocheck Report presented in Appendix 3 of the Application Site Report - Golders (2005) Site History The Site was undeveloped land until approximately 1903, when the eastern part of the site comprised a wharf. The wharf is not present on maps published past 1956, suggesting it has been backfilled. As such, some unnatural fill materials may be present within this part of the site. From 1984, the site was operated by industrial cleaners before being operated by Caird as a waste treatment plant. Shanks first occupied the site in 1999. The permit was transferred to Veolia in 2006. It has not been operational since. Veolia's bin refurbishing team - Relife has been present on site in the last few years. It is not known when the site was first surfaced with hardstanding. However, before the site was surfaced, any spillage of material to ground could have resulted in the contamination of the soil and/or groundwater beneath the site. as such, it may be expected that historical contamination is present at the site. History of Surrounding Area The area surrounding the site was largely undeveloped until approximately 1964, when a number of Works are shown to be present to the northwest and west of the site. Additional works buildings appear in subsequent years, which forms part of the currently present industrial park. The activities undertaken within the works buildings have not been identified on historical maps. If the historical activities undertaken north of the site (i.e. up gradient of the site) had resulted in significant contamination, the potential exists for this contamination to migrate beneath the site. Potential Existing Sources of Contamination Onsite Sources: The potential for contamination from activities prior to surfacing of the site as described above. A number of potentially polluting substances were present at the site when it was operational (prior to 2006). This included wastes accepted on site for transfer and/or treatment and the raw materials used during the treatment process. Golders undertook a site assessment in 2005 based on wastes received during 2004. They indicated that the predominant waste streams at the site were aqueous wastes containing cyanide or chromium and hydrochloric

	acids. Oil-based wastes were also present at the site. Flammable liquids, such as solvents, toluene and paints were in minor volumes. More recently the site has been used to refurbish damaged bins, however this is not a waste management activity. Bins are repaired and painted within the main building and stored on the hardstanding. The potential for pollution to ground from this activity is negligible. Offsite Sources The Golders Report has identified a number of potential offsite sources of contamination which include historical industrial/commercial activities surrounding the Installation. The aforementioned report identified a number of potentially contaminative activities taking place in the vicinity of the site, including motor vehicle repairs, leather product manufacturers and engineers. There were no registered landfills, waste facilities, registered contaminated land, or major pollution incidents within a 250m radius of the site **2.9 Visual and/or olfactory evidence of existing contamination.** A recent site walkover (July 2023) did not identify any issues with the internal and external concrete hard standings. There was no olfactory evidence of existing contamination. **2.10 Evidence of damage to pollution prevention measures.** The site walkover noted a number of minor cracks and repairs to the concrete hardstanding throughout the site. There was also a need to reseal some joints. The condition of hardstanding will be checked by Veolia and further repairs made as necessary prior to operation of the battery treatment plant.. **2.11 Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports.** No previous site investigations are known to have been undertaken at the Installation. **2.12 Baseline soil and groundwater reference data.** No ground investigations have been undertaken to provide baseline soil and groundwater data for the Installation. Given the extent of hardstanding at the site and for most of the activities that will be carried out (see Section 3) there is very little risk of releases to ground occurring. Given the activities will be undertaken above ground and internally on concrete and screed hardstanding, it is considered that

	baseline soil and groundwater data will not be required for the installation.
Baseline soil and groundwater reference data	see above

3.0 Permitted activities	
Permitted activities	This application is to substantially vary the existing permit (EPR/DP3304BQ/T003) with the following changes (new activities highlighted in **bold**): ● AR1 - S5.3 A(1)(a)(iv) - Repackaging of hazardous waste - manual sorting and separation and bulking - treatment of <10t hazardous waste/day for the purposes of recovery. ● **AR2 - S5.3 A(1)(a)(ii) - Physico-Chemical treatment via pH adjustment (or any other chemical treatment) of 10t hazardous waste/day for disposal. pH adjustment of effluent arising from on site process prior to filter press (shredding AR8)** ● AR3 - S5.6 A(1)(a) - Temporary storage of >50t hazardous waste pending disposal or recovery. ● **AR4 - S5.3 A(1)(a)(ii) - Physico-Chemical treatment - sieving/separation for recovery of 10t hazardous materials/day generated from shredding lithium batteries (AR8)** Directly Associated Activities: ● **AR5 - Raw materials handling and storage (chemicals)** ● **AR6 - Filtrate and filter cake storage** ● **AR7 - Discharge to foul sewer** ● AR8 - Shredding of lithium batteries prior to AR4. ● **AR9 - Discharging batteries prior to AR8** Waste Activities: ● AR10 - Physico-Chemical Treatment of non-hazardous waste - inspection/testing/discharging, dismantling prior to AR8. ● AR11 - Storage of non-hazardous waste - lithium batteries. ● AR12 - Repackaging - manual sorting and separation and bulking of non-hazardous waste for the purposes of recovery.
Non-permitted activities undertaken	n/a
Document references for: ● plan showing activity layout; and ● environmental risk assessment.	Permit Application Supporting Statement: August 2023 – Appendix A (Site Plans) Permit Application Supporting Statement: April 2023 – Appendix C (Environmental Risk Assessment) Permit Application Supporting Statement: April 2023 – Appendix E (Site Condition Report and Application Site Condition Report - Golders (August 2005).

4.0 Changes to the activity	
Have there been any changes to the activity boundary?	
Have there been any changes to the permitted activities?	
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	
Checklist of supporting information	

5.0 Measures taken to protect land	
.	
Checklist of supporting information	

6.0 Pollution incidents that may have had an impact on land, and their remediation	
Checklist of supporting information	

7.0 Soil gas and water quality monitoring (where undertaken)	
Checklist of supporting information	

8.0 Decommissioning and removal of pollution risk	
Checklist of supporting information	

9.0 Reference data and remediation (where relevant)	
Checklist of supporting information	

10.0 Statement of site condition

APPENDIX F

TECHNICAL COMPETENCE

wamitab

Certificate No: 13962

CERTIFICATE OF TECHNICAL COMPETENCE

This Certificate confirms that

Karamjit Singh Bhurjee

Has demonstrated the standard of technical competence required for the management of a facility of the type set out below

Facility Type

Level 4 in Waste Management Operations -

Managing Treatment Hazardous Waste (4TMH)

Authorising Signatures:

Chief Executive Officer

Director:

Date of issue: 15 February 2016

00021048

CIWM

Continuing Competence Certificate

This certificate confirms that

Karamjit Bhurjee

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 17/02/2022

CW	Clinical Waste
TMH	Treatment - Hazardous Waste

Expiry Date: 17/02/2024

Verification date: 04/02/2022

Authorised:

Professional Services Director

Learner ID: 113034

Certificate No.: 5193065

Date of Issue: 17/02/2022

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

Scan code on reverse to authenticate that this is a genuine paper

WAMITAB

WASTE MANAGEMENT INDUSTRY TRAINING AND ADVISORY BOARD

CERTIFICATE No: 09881

CERTIFICATE OF TECHNICAL COMPETENCE

This Certificate confirms that

Ranjit Singh Sira

has demonstrated the standard of technical competence required for the management of a facility of the type set out below

Facility Type:

Level 4 in Waste Management Operations -

Managing Transfer Hazardous Waste (4TSH)

Authorising Signatures:

Director General

Director

Date of issue: 08 July 2008

WAMITAB

WASTE MANAGEMENT INDUSTRY TRAINING AND ADVISORY BOARD

CERTIFICATE No: 09629

CERTIFICATE OF TECHNICAL COMPETENCE

This Certificate confirms that

Ranjit Singh Sira

has demonstrated the standard of technical competence required for the management of a facility of the type set out below

Facility Type:

Level 4 in Waste Management Operations -

Managing Treatment Hazardous Waste (4TMH)

WAMITAB INCORPORATED 2005

Authorising Signatures:

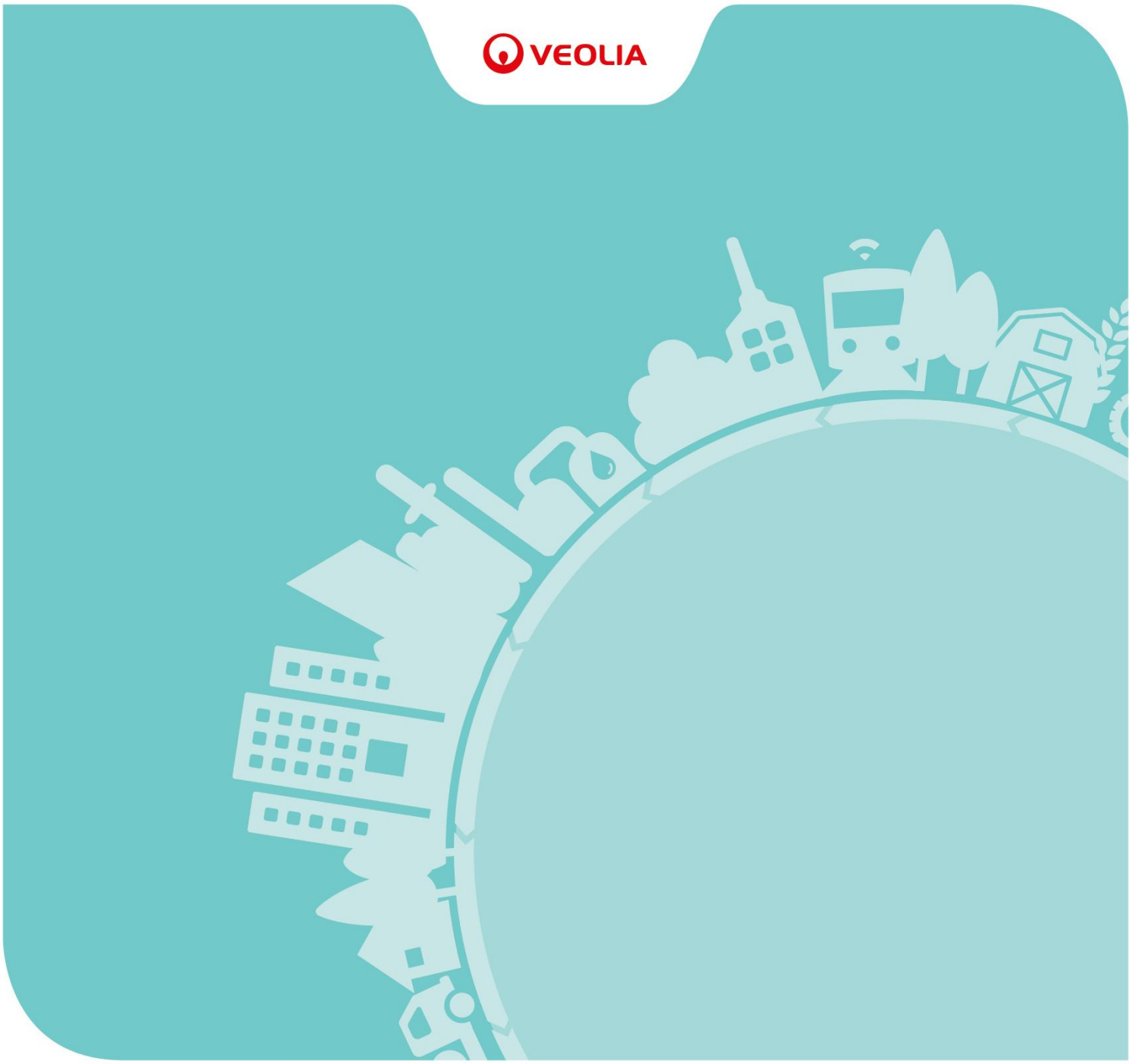
Director General _____

Director _____

Date of issue: 02 April 2008

APPENDIX G

FIRE PREVENTION PLAN



Fire Prevention Plan

Minworth EV Li ion Battery Recycling Facility

Forge Lane, Minworth Industrial Estate, Sutton Coldfield, West Midlands, B76 1AH

Permit Reference: EPR/KP3396FQ

Date: September 2023

Version: 3.0

Version History

Version	Revision date	Date submitted to Environment Agency	Reason for revision
V1.0	April 2022		Change in operational techniques
V2.0	May 2022		Updated following EA review
V3.0	September 2023		Updated as part of permit variation application

Contents

1. Process Overview

1.1. Type of site

The Minworth EV Li ion Battery Recycling Facility, 'the Facility' which will be operated by Veolia ES (UK) Limited 'VES', is a refurbished building on a permitted site comprising the following elements:

- A refurbished building for the assessment, discharge and dismantling of automotive and industrial Li-ion batteries and the sorting and repacking of other batteries
- At least two 40 feet shipping containers and bunded yard area for the storage of waste batteries received and those that have been discharged and dismantled into modules or cells
- Associated used and new packaging materials. The facility will accept and process or transfer up to 1,500 tonnes per year of waste batteries by 2025.
- Wet shredding capability for up to 3,000 tonnes per annum of Li batteries

The facility has the primary purpose of serving regional transfer and national customers who require a service for the recycling of their Li-ion batteries. Industrial and automotive batteries are prohibited from incineration or landfill by the Waste Batteries and Accumulator Regulations. The site will also receive mixed batteries for sorting into chemistry and shipping to recyclers in the UK or abroad.

In normal operating circumstances, industrial electric vehicle (EV) and automotive Li-ion batteries will be brought to site, and subsequently assessed, discharged and dismantled. There will also be an option for transfer without any treatment, except for checking the

condition of the batteries. This option is less favourable due to the increased carbon footprint of transport.

Historically, the site was a hydrometallurgical hazardous waste treatment plant managing waste acids, alkalis and neutral sludge waste as well as cyanide bearing waste and water reactive chemicals such as acid chlorides. The buildings were part of a hazardous waste transfer station. The permit was originally amended as Veolia intended to install an alkaline and portable battery recycling facility. However, these were changed when Veolia divested its share in the BatteryBack Battery Compliance Scheme in 2016 and WasteCare developed an alkaline battery recycling facility in Halifax. As the sales of EVs continues to grow at a rapid pace supporting the Government's decarbonisation efforts, the Minworth site can now provide an EV battery recycling facility in the centre of the UK and grow as this market develops over the next few years.

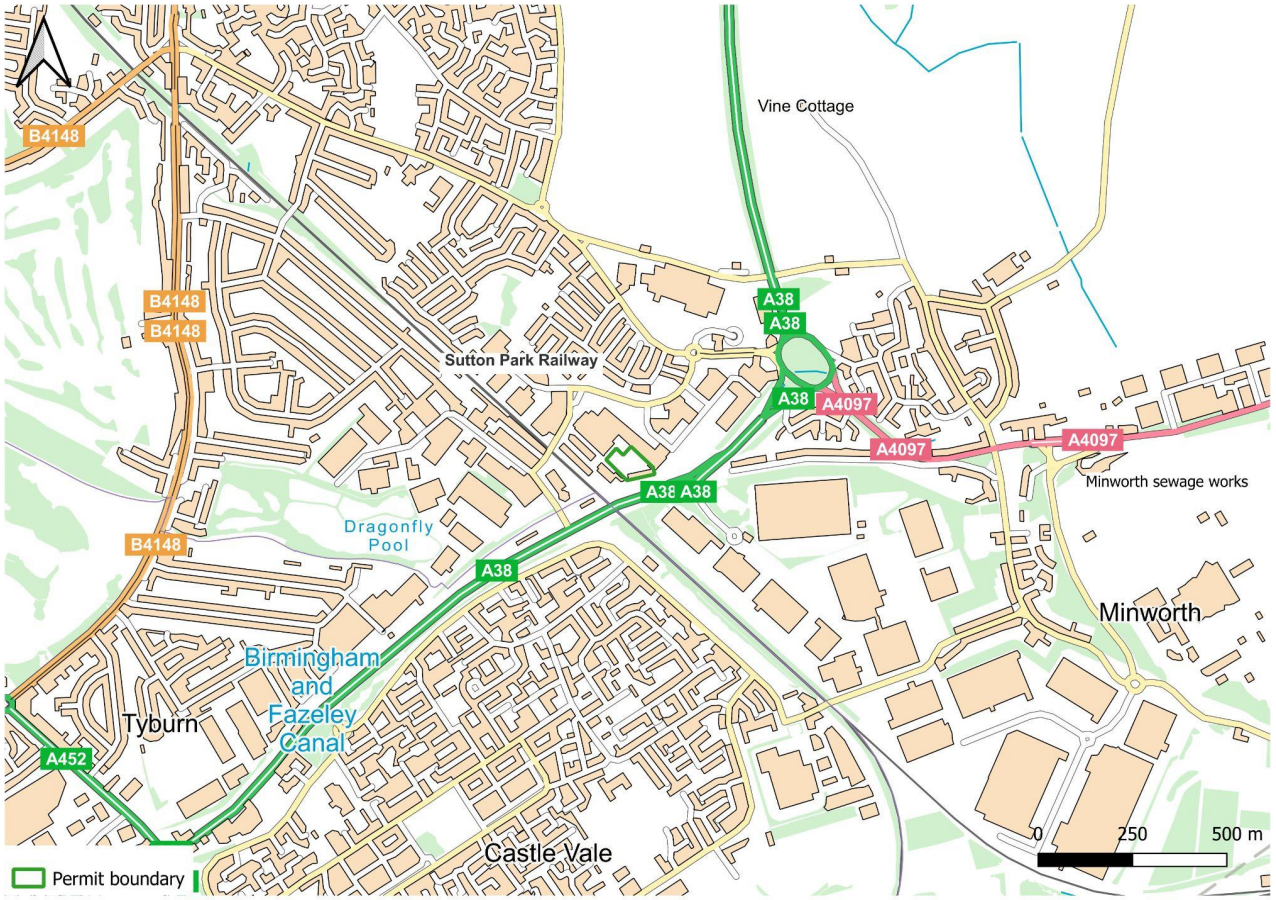
1.2. Site setting and location

The facility is located off Forge Lane in Minworth, Sutton Coldfield. The activity on site is currently shared with another Veolia operation involved in the refurbishment of metal skips, known as ReLife. The RELife operation will be moving from site in 2023. Access to the site is via a tarmac roadway through the recently constructed Minworth Industrial Park, following the demolition of the previous neighbouring building.

The full address for the site is detailed below:

Veolia ES (UK) Limited
Minworth Industrial Park,
Forge Lane,
Sutton Coldfield,
West Midlands,
B76 1AH

Figure 1. Site Plan



1.3. Operational profile

The Facility is likely to operate for up to 10 hours per day, Monday to Friday, given the expected tonnages of batteries to be received. Weekend working is possible but unlikely in the first few years of operation.

The proposed core hours of operation will typically be expected to be 0900 – 1700 with occasional loads in or out outside of these hours by special arrangement.

Battery handling operations will cease one hour before closing to allow temperature and other safety checks to be undertaken.

1.4. Maintenance and review of the FPP

Table 1 - Training, document access and key review intervals

Training / review aspect	Details
Post holder responsible for FPP related training	David Reynolds - Business Manager
FPP storage location (physical copy)	Site management system folder (hard copy)
Review interval criteria	Annually (entire document)
	Following an incident which resulted in actual or potential fire
	Following instruction by the Environment Agency under the relevant condition of the environmental permit (as agreed with the regulator)
Training overview	The Veolia Management System 'VMS' includes a procedure that defines the process and responsibilities of personnel involved in the identification and evaluation of learning and development needs as well as the subsequent implementation of essential training to enable all employees to perform effectively and proficiently in their individual jobs Site personnel are aware of the parts of the permit relevant to their role and a copy of the permit is available A training matrix for all site personnel is in place and updated with all personnel trained according to the requirements of their role, including refreshers Monitoring is in place to demonstrate competency
Training interval	Management will maintain a statement of training requirements for each operational post and keep a record of the training received by each person whose actions may have an impact on the environment.

1.5. Relevant sector guidance on which this FPP is based

Table 2 - Reference documents

Guidance title	Source	Publication date / date accessed
Fire prevention plans: environmental permits	https://www.gov.uk/government/publications/fire-prevention-plans-environmental-permits/fire-prevention-plans-environmental-permits	11 January 2021
Develop a management system: environmental permits	https://www.gov.uk/guidance/develop-a-management-system-environmental-permits	August 2023 [accessed]

(BAT) conclusions for waste treatment, under Directive 2010/75/EU	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2018.208.01.0038.01.ENG&toc=OJ%3AL%3A2018%3A208%3ATOC	August 2018
Appropriate Measures for permitted facilities.	https://www.gov.uk/guidance/chemical-waste-appropriate-measures-for-permitted-facilities	August 2023 [accessed]

2. Process Stages

2.1. Waste Inputs

Batteries will normally be processed in the order delivered, unless batteries appear to need more immediate action e.g. damage, leaks or other signs of instability.

Any incorrectly declared battery deliveries will be quarantined immediately and dealt with in line with local procedures and guidance as detailed in the management system.

Pre-acceptance and waste acceptance procedures are in place for all batteries received at the site to ensure that incompatible or reactive wastes are not accepted at the Facility. In the event that a warm battery is detected during acceptance the primary option is to offload the battery to a quarantine container, although each incident will be event specific and the site management shall be responsible for managing the situation. The fire service will be called if the battery temperature continues to rise and the incident is deemed as beyond the capabilities of the site staff and resources.

2.2. Storage & Loading

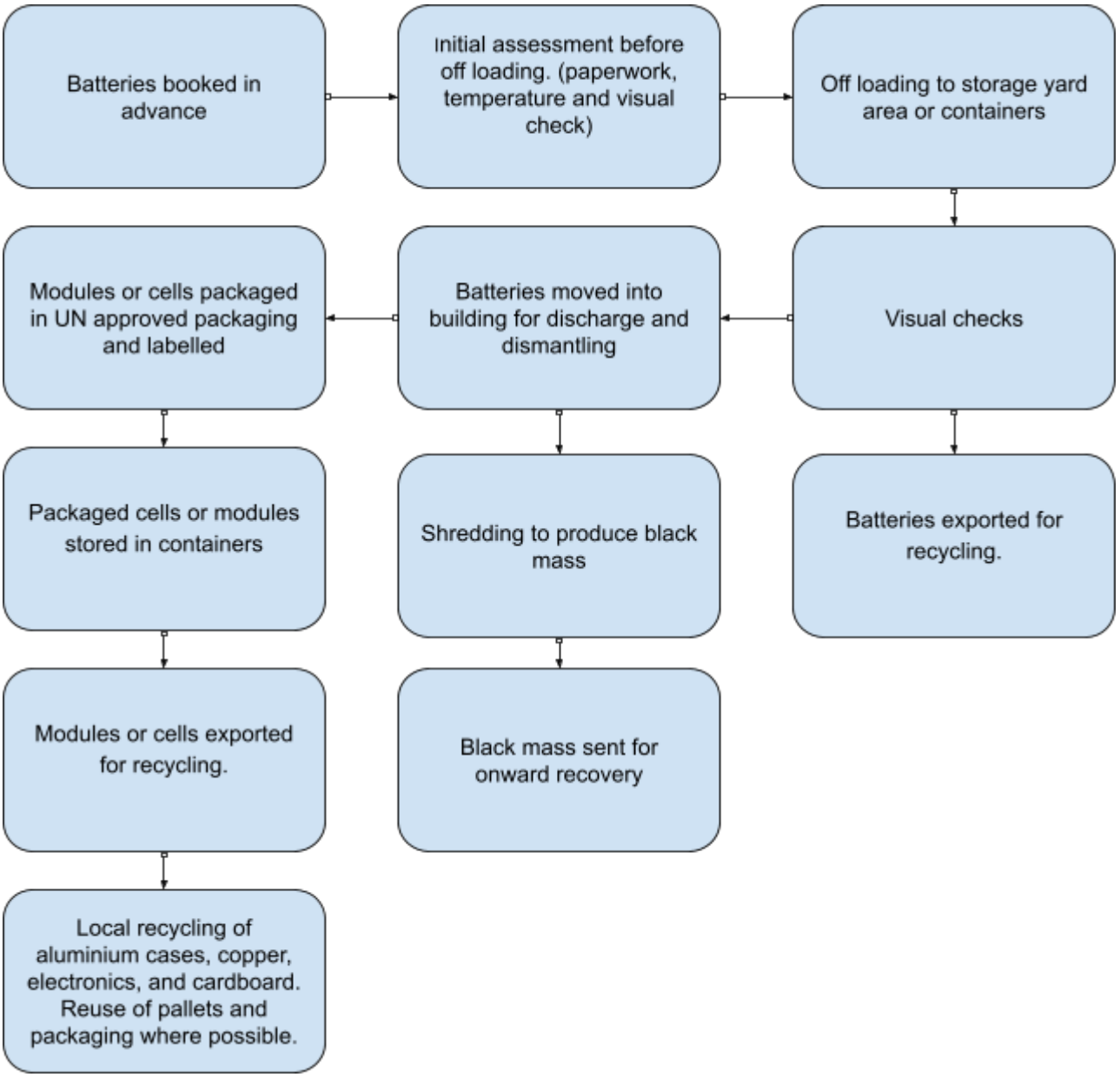
Waste collected or delivered from businesses will be transported by curtain sided or covered vehicles of various types throughout the working day. Following acceptance checks (including temperature) and weighing, waste arriving at the site is stored either in the bunded open air yard area (weatherproof packaging only), battery reception bays or in the shipping containers.

Figure 2. Example of weatherproof battery containers

2.3. Processing

EV batteries are likely to be discharged of the remaining electrical energy and dismantled into cell or module level. The level of dismantling will depend on the structure of the battery pack, modules, and cells (cylindrical, pouch or prismatic). Batteries may also leave the site as they arrived, with no further processing. This may be because the batteries have a design that does not lend itself to dismantling (e.g. Li ion automotive batteries), if the discharge equipment is unavailable, or for commercial reasons (e.g. availability and efficiency of process in France).

Figure 3 - Simplified process flow diagram for safe receipt and processing of EV Li ion batteries



3. Managing common causes of fire

3.1. Arson

The area is secured by a 2.4m fence around the entire perimeter with lockable gates at the access point. The Facility is covered by an actively monitored CCTV system providing 24/7 surveillance. Any unauthorised access would be detected and trigger an intervention either by VES staff, security staff, Police, FRS or other enforcement agency responder as appropriate to the ingression on site. The site will also benefit from security patrols of the newly constructed industrial park and its perimeter fence and gates. The main gate to the access road to the industrial estate is locked between 0600 and 1900).

3.2. Plant & Equipment

All vehicles, plant and equipment will be maintained in accordance with manufacturer's recommendations.

A daily check sheet is completed for all static and mobile plant. If an issue is identified, then a defect sheet is completed, passed onto the maintenance team and recorded on line in the electronic management system. Once appropriate repairs are completed the defect sheet is signed off.

Plant will be stored overnight at least 6m from batteries and combustible packaging and waste.

All electrical installations repairs and maintenance will be carried out by suitably qualified electricians certified to NICEIC.

Portable appliance testing is carried out annually and fixed electrical systems are checked every 3 years.

3.3. Smoking Policy & Procedures

VES operate a Smoke Free Policy and have Smoke Free Procedures in place for the Facility.

The designated smoking area is located adjacent to the office, away from any waste treatment and storage of any combustible materials.

3.4. Hot Works & Ignition Sources

Hot works will be carried out when required by external contractors and will be subject to a job specific risk assessment, permit to work and fire watch requirements. Fire watch will continue for 30 minutes after hot works have ceased and any hot works will cease at least 30 minutes before the site closes.

Site operatives will be on continuous fire watch throughout operational hours. Portable thermal imaging cameras will also be used to identify any batteries which may show signs of thermal runaway. Specific fire watch inspections will be made twice per day with one of the inspections included as part of the site shutdown / closure procedure at the end of each shift.

There will be no naked flames, space heaters, or other sources of ignition within 6m of any combustible waste or packaging.

There is no storage of diesel on site.

Small amounts of flammable products (e.g. paint) will be stored in a COSHH cabinet.

3.5. Spillage of liquids

Li-ion batteries received at site are sealed dry articles and do not present a liquid spillage hazard.

The quantity of flammable liquid products (e.g. paint and thinners) on site is kept to a minimum and is stored in a designated COSHH storage container away from sources of ignition. Only original packaging is used and lids are placed back on containers in use. Spill kits are available to deal with any spillage and absorbent granules can be quickly used to contain and absorb any spillage. This waste would then be packaged and transported as hazardous flammable solid waste. Operators on site are trained in safely dealing with any spillages of liquid, including flammable paint, thinners or diesel.

3.6. Cleaning Regime

Daily site inspections will be carried out to control litter and ensure combustible waste and packaging are stored in appropriate areas. Any areas identified by the inspection will be cleaned as soon as reasonably practicable. All plant will be maintained and serviced in line with manufacturer's recommendations. All plant will be inspected on a daily basis and records of checks and defect reporting will be recorded.

4. Preventing and Identifying Thermal Runaway

4.1. Thermal Runaway

Li-ion batteries can undergo a chain reaction where heat is created at a greater rate than it can be dissipated. This is known as thermal runaway, “TR”. TR can be caused by manufacturing faults, heat, moisture, short circuits and physical damage. TR can release flammable vapour clouds, hydrogen and other gases, as well as heat, and may be accompanied by fire.

4.2. Ambient heating

Batteries stored outside will be subject to ambient heating during periods of hot weather. However, research by Herstedt[1] concluded that the lowest temperature at which a Li-ion battery could start to have safety issues was 60 degrees Celsius which is unlikely to be reached in the UK.

As a precaution the effect of ambient temperature on batteries stored externally will be monitored very closely, particularly in the initial period of operation, in order to characterise any risk and respond quickly and effectively if any additional controls are indicated. Where additional controls are indicated there are a range of options available:

- Shipping containers will be painted white to reduce heat absorption.
- White shrink wrap will be used to wrap packages if available.
- Batteries stored externally would be shaded from direct sunlight by covering them with white tarpaulin or wooden boards with a white reflective coating.
- During periods of warmer weather batteries stored outside could be separated, enabling heat generated within the waste to be released.
- Temperature monitoring will be increased to 4 times per day during periods where external temperatures are above 35 degrees Celsius.
- During excessively hot weather, the storage time for batteries stored externally could be reduced by prioritising them for processing.

4.3. Temperature Monitoring and Action

Portable thermal imaging cameras will be used twice per day to check if any batteries are showing signs of heating. If a battery appears to be heating then one of the following actions will be taken, depending on the risk assessment carried out at the time:

- Call Fire and Rescue Service (FRS)

[1] M. Herstedt, Towards Safer Lithium-Ion Batteries, vol. 876, Uppsala: Acta Universitatis Upsaliensis, 2003.

- Move battery to more remote area (especially if on trolley at time)
- Place fire blanket over battery
- Immerse battery in water

Use of temperature triggers is not proposed as Veolia considers a threshold based response is inappropriate to the type of waste and risk. Thermal imagery will be one line of evidence used to detect any signs of thermal runaway with appropriate action being taken on a case by case basis. Risks will be assessed on a case by case basis and would be a combination of evidence:

- Condition / type the battery / cell / module and all available intelligence about what is normal for that unit
- Battery / cell / module temperature vs ambient temperature
- Battery / cell / module temperature vs surrounding battery / cell / module

4.4. Fire Detection - workshop building

The workshop building is fitted with linked smoke detectors. The building area is not a dusty environment so we do not expect false alarms caused by dust.

The smoke detection system is third-party certified to EN54 parts 2 and 4 by the Loss Prevention Certification Board 'LPCB' (certificate number 176b).

BS EN 54-2:1997+A1:2006 - Control and Indicating Equipment
BS EN 54-4:1998 - Power supply equipment.
The alarm panel is connected to an auto dialling system. In the event of an alarm, our CCTV operator, MPS, is notified. They will then monitor the CCTV cameras and notify a key holder and or the Fire Service depending on what is seen on the CCTV system.

The fire detection system is shown in Figure 4.

Figure 4 - Fire detection system within the Treatment Building

4.5. Shipping Containers

The shipping containers used for battery storage use a Stat-X aerosol based fire suppression system that is automatically activated in the event of a fire, (See Section 8 for more details). The containers will also have water mist nozzles fitted internally connected to a dry riser. An external hose branch connection will allow the FRS to attach a hose to the mist system so that any residual fire can be dealt with safely and efficiently, as well as Li-ion batteries in thermal runaway.

4.6. Battery Storage Bays

The site will have 4 storage bays for the receipt of incoming batteries. These bays will have 2 hour fire resistant walls and a freeboard of 2 m above the stored batteries. These bays will have fire detection and an automated deluge system, fed by a 1000 cubic metre fire water storage tank on site. The deluge system will automatically activate in the event of a fire and deluge the stored batteries at 50mm per min per square metre.

4.7. Storage times and stock rotation

Table 3 describes maximum storage times for waste on site. The storage philosophy will be different for energy storage waste than other waste types.

Li-ion battery waste will be logged and labelled to ensure a maximum storage limit of 6 months is not exceeded. Battery waste may not necessarily be processed on a first in - first out 'FIFO' philosophy particularly where dismantling lines are configured to a certain manufacturer battery type. It would be more efficient to continue to process that battery type before switching battery format. We do not consider there is an increased risk from batteries / cells as storage time increases, in fact this is a positive indication of stability.

Non Li-ion battery waste will be handled using a FIFO system per waste fraction. Some wastes e.g. metals may be bulked on site up to proposed storage limits depending on market conditions.

5. Waste Storage

5.1. Storage locations

Waste will be stored / processed in defined areas as per the table below:

Table 3 - location dimensions and capacity.

Bay number	Waste status	Waste dimensions (m)			Storage description	Max. storage time	Storage capacity (m^3)
		Width	Depth	Height			
EXTERNAL STORAGE AREAS							
1 - Shredded material storage	Waste	10	12	2.5	Fire resistant legio block bay	<6 months	300
2 - Shredded material storage	Waste	10	12	2.5	Fire resistant legio block bay	<6 months	300
3 - Shredded material storage	Waste	10	12	2.5	Fire resistant legio block bay	<6 months	300
4 - Shredded material storage	Waste	10	12	2.5	Fire resistant legio block bay	<6 months	300
A - Input batteries and quarantine	Waste	13	2.44	2.59	Shipping container	<6 months	82
B - Input batteries and quarantine	Waste	13	2.44	2.59	Shipping container	<6 months	82
5 - Covered batteries storage area	Waste	3	10	2.5	Fire resistant legio block bay	<6 months	75
6 - Covered batteries storage area	Waste	3	10	2.5	Fire resistant legio block bay	<6 months	75
7 - Covered batteries storage area	Waste	3	10	2.5	Fire resistant legio block bay	<6 months	75

8 - Covered batteries storage area	Waste	3	10	2.5	Fire resistant legio block bay	<6 months	75
9 - Covered batteries storage area (discharge baths)	Waste	8	9.2	2.5	Fire resistant legio block bay	<6 months	184
10 - Yard - packaging stock[1]	Non waste	13	2.4	2.4	Designated yard area	<6 months	75
11 - Cardboard recycling skip	Waste	3	1.5	1.5	Enclosed skip	<6 months	7
12 - Quarantine container	Waste	2.5	2	2	Open ended steel skip	<6 months	10
INTERNAL STORAGE AREAS							
13 - Building - discharge area (Li ion batteries)	Waste	10	3	1	Designated area inside building	<6 months	1-3 in process batteries
14 - Building - drying area	Waste	2	2	1	Designated area inside building	<2 days	4
15 - Building - dismantling area	Waste	10	3	1	Designated area inside building	1 week	1-3 in process batteries
16 - Building - aluminium, copper, WEEE in separate containers	Waste	10	4	1	Assortment of moveable containers up to $1m^3$	<6 months	40
17 - Building - packaging stock[2]	Non waste	10	2	2	Designated area inside building	<6 months	40

[1]Note that packaging stock will comprise an assortment of incoming cardboard/plastic containers which will be reused for battery dispatch or returned to the customer.

6. Preventing Fire Spreading

6.1. Separation Distances

Environment agency FPP guidance recommends a 6m separation distance between the site boundary and waste piles.

Piles 1 - 9 are formed of 2 hour fire resistant legioblock bays.

Pile 10 is a designated area in the yard external to the building.

Piles 11 - 12 and 16 are in moveable containers.

Piles 13 - 15 are designated areas within the treatment building comprising containers which could be moved in the event of a fire.

Piles A and B (quarantine battery / inputs) are individual containers installed with a dedicated sensitive and pro-active fire alarm and control system (described in section 8.1). There is also a mechanism to introduce water mist into the containers for fire fighting purposes. Piles A and B will be 4m from the internal site boundary which comprises concrete bunding to approximately 1.1m and corrugated metal cladding to an overall height of approximately 2m, there is then an additional 4m laterally from the site boundary to the nearest industrial unit. The intervening ground comprises vegetation and a small watercourse.

Based on the descriptions above, type of waste, pile size, pile management and associated controls this is expected to present a tolerable risk of fire spreading.

6.2. Fire Resistant Coverings

The left hand side dividing wall of the processing area in the building has 60 minutes fire resistance and the roof has 1.5 metres of fire resistant coating on either side of the dividing wall. This wall separates the battery activities from the other side of the building. The remainder of the walls of the processing area are of brick construction. The ceiling of the extension at the back of the building is covered in dry lining board providing 60 minutes fire resistance to protect the wooden rafters and flat roof in the event of a fire.

Figure 5 shows the internal structure of the Treatment Building.

Figure 5 - Internal arrangement of the Treatment Building

6.3. Quarantine Container and quarantine area

6.3.1. Quarantine container

One of the shipping containers will be designated as a quarantine container for any high risk batteries based on their temperature, physical appearance or history. Batteries, if safe to move, will be placed in this container which will protect the Facility from incident escalation.

6.3.2. Quarantine area

A quarantine area will be maintained in the centre of the yard area which could be used for batteries or for other waste types on site. This area is large enough to hold half of the largest waste pile on site and will be 6m from any other combustible material. The

quarantine area is on sealed drainage and there is an option to cease sewer discharge from the site by deactivating the pump either near the sewer outlet or at the main gate (see 6.5).

6.4. Natural Gas Supplies

The site has no supply of natural gas.

6.5. Electricity Supplies

The electrical supply into the site is located by the main entrance and can be easily isolated in the event of an emergency. The discharge equipment uses a bender relay to stop the discharge of batteries in the event of a power failure or isolation of the network.

6.6. Asbestos

There is no asbestos in the battery processing or storage areas that would cause delays during the suppression of any fire on site or be spread around the local area.

7. Fire Detection

Regular visual inspections of waste batteries, for signs of smoke, vapour and / or increased temperature will be carried out as follows:

- All loads arriving at the site will be visually inspected on arrival for physical damage to packaging or batteries as well as checking for increased temperature. Any hotspot highlighted by the camera on a battery will be investigated to determine further actions. Further actions could be to take no further action, segregation of the battery, or calling the Fire Service depending on the findings of the investigation. Non-conforming batteries will be quarantined as per other sections of this document.

- The exterior and interior of the building is fitted with CCTV coverage with out of hours monitoring, intruder detection, and remote access for site staff. Cameras and intruder monitoring alarms have been installed by Maximum Protection Services Ltd (MPS), a tier 1 supplier of Veolia with similar equipment and systems at more than 100 Veolia sites. The routes of entry to the high risk areas of the site will be covered with CCTV and intruder alarms. The site will be monitored 24/7 by MPS Ltd. If an alarm is triggered, the monitoring staff will view CCTV footage of the site and take action depending on the circumstances. This may be giving audible warnings to persons on site, contacting Veolia key holders or contacting the Police. MPS have direct lines to Police control rooms and do not have to use 999 to request the Police.

- In the event of a fire being detected out of hours, site management would be contacted and would attend the site. Operatives would also be available out of hours in the event of the need for plant and machinery to be used to assist the FRS.

- Emergency contact procedures and contact details are contained within section 15.

8. Fire Fighting

The on-site resources available for firefighting include fire extinguishers, Stat-X fire suppression system, fire blankets, water baths, and trained fire marshals.

Given the quantities of combustible materials on site and the fire prevention and mitigation measures in place, any fire should be easily extinguished within 4 hours by the FRS.

The FRS will be invited to site to carry out a “7(2)(d)” visit so that they can update their Site Specific Risk Information (SSRI). This information is held by Fire Control and can be downloaded to the mobile data terminals in attending fire engines.

8.1. Shipping Containers - Stat-X

The shipping containers are fitted with an automated Stat-X fire suppression equipment supplied by Nobel Fire Systems. The system will include:

- Stat-X fire suppression system complete with control panel, smoke and heat detection and audible visual alarms, internally and externally.
- Carbon monoxide detection to confirm presence of gases.
- Internal dry pipe spray system connected to external dry riser fire service pumping inlet to allow water deluge without requirement to make entry into the containers.

The system has been selected for fire prevention at the Minworth site on the basis that it is specifically designed for suppression of fire involving battery storage.

Stat-X is a very fine potassium particulate that reacts chemically with the fire to suppress the flames.

The particulate remains in suspension for up to an hour giving any materials time to cool preventing the fire from re-igniting. When discharged it is very similar to a gas and will flow through any part of the room that fire or heat build-up may occur.

Condensed aerosol fire suppression is a particle-based form of fire suppression system similar to gaseous fire suppression and dry chemical fire suppression systems. The aerosol produced employs a fire suppression agent consisting of very fine solid particles of potassium compounds and gaseous matter (acting primarily as a carrying agent) to suppress fires. The condensed aerosol micro particles and gases are generated by an exothermic reaction. The potassium compounds are stored within a container as a solid

material and when heated to a sufficient level decomposition processes take place to produce the aerosol.

The system is designed and approved to ISO 15779:2011 (Condensed aerosol fire extinguishing systems), BS EN 15276-2:2019 (Fixed firefighting systems. Condensed aerosol extinguishing systems Design, installation and maintenance), UL 2775 (UL Standard for Safety Fixed Condensed Aerosol Extinguishing System Units), good engineering practice and the manufacturer's design, installation and commissioning procedures.

Stat-X is certified by the EPA – Environmental Protection Agency as safe for use in normally occupied areas.

Stat-X has undergone two separate and independent testing programs focused on the BESS hazard.

- First, Stat-X contracted DNV GL (now known as DNV), an international leader in testing, to conduct trials of Stat-X on lithium-ion battery fires. The results were extremely positive:
    - Stat-X was proven effective at extinguishing single and double cell lithium-ion battery fires.
    - Residual Stat-X airborne aerosol in the hazard provides additional extended protection against reflash of the fire.
    - Stat-X reduced oxygen in an enclosed environment during a battery fire to 18%.
    - Due to the deep-seated nature of a stacked battery fire, as expected, Stat-X removed heat from the interior of the cells more slowly than the exterior.
    - The residence time of gases and aerosols during Stat-X deployment is a function of when the atmosphere is ventilated.
- Second, Stat-X contracted PVEL, a leader in renewable energy product and regulatory testing, in conjunction with multiple subject matter experts in the battery energy storage system 'BESS' testing field, to perform full-scale testing in compliance with UL9540a (Testing the fire safety hazards associated with propagating thermal runaway within battery systems).
    - During the period of Stat-X discharge and agent hold:
        - No significant increase in temperature was observed
        - No flames were observed
        - No deflagration or explosion was observed
        - Thermal runaway did not propagate to adjacent battery racks

The Stat-X aerosol will automatically discharge in the event of a fire and suppress a conventional fire involving packaging materials. The Stat-X may not stop thermal runaway in all batteries in the container, although it will lower the temperature.

The containers will also be fitted with water spray nozzles. An external fitting will be in place so that the FRS can connect to the spray system. This spray will also prevent a flammable atmosphere from developing inside the container that could be ignited when the oxygen concentration increases when the doors are opened.

8.2. Water Supply

The site will have a 1000m^3 fire water storage tank and associated pumping system to feed the deluge systems in the battery input storage bays 5 - 8.

According to FPP guidance 360m^3 of water will be required based on a maximum pile size of 300m^3 for the black mass storage bays.

FPP guidance suggests for a 300m^3 pile there should be a water supply of at least 2000 l/m for a minimum of three hours.

Although there are no fire hydrants within the site boundary (see section 9, Water Supply, for a map of local fire hydrants) the most likely hydrant for use during an emergency is at the entrance to the site, adjacent to the entrance gate what3words ///scarcely. nature.yoga. The hydrants have been confirmed via West Midlands Fire Rescue Service that they conform to BS 750 2012 and the water company provides a minimum flow guarantee of 8 l/s. The hydrant could therefore provide 480 l/m continuously if required.

Birmingham and Fazeley Canal is located to the south of the site and could also be used for fire fighting water if required. Access will be maintained to the canal through the rear door of the battery operations building where the FRS can gain convenient access on level ground to the canal. This will allow as much water as needed for any incident on site, with the FRS using their light portable pumps (LPP) to supplement fire engine water supplies. LPP are carried on all front line appliances.

8.3. Fire Extinguishers

Water, carbon dioxide and dry powder fire extinguishers are located within the building and around the site to manage small fires that may arise as a result of the operation. In the case of a large fire the evacuation plan will be put in place to exit the site and allow the FRS to safely manage the incident.

In the event of a fire taking place outside the storage bays but within the permitted area, the most effective fire fighting strategy would be to extinguish any fire as soon as possible. However, it is important that staff do not put themselves at risk from an escalating fire as

they will not be wearing fire kit or self contained breathing apparatus. This will be covered in training on the use of fire extinguishers for the staff.

The primary use of fire extinguishers is to facilitate the escape of personnel in the event of a fire; they may also be used to quickly extinguish very small / localised fires. Mobile plant and wheeled workbenches may be utilised to move batteries away from heat sources and reduce the risk of propagation from escalation of TR.

In addition to on-site resources, VES is a large waste management company that operates an emergency response service for its customers. This service will be available in house to deal with a fire related incident and the subsequent aftermath, such as contingency arrangements and fire water management.

West Midlands Fire Service prides itself on a response time of five minutes for a response to a category 1 incident. The nearest FRS resources to the Facility are detailed below.

Table 4 - FRS locations

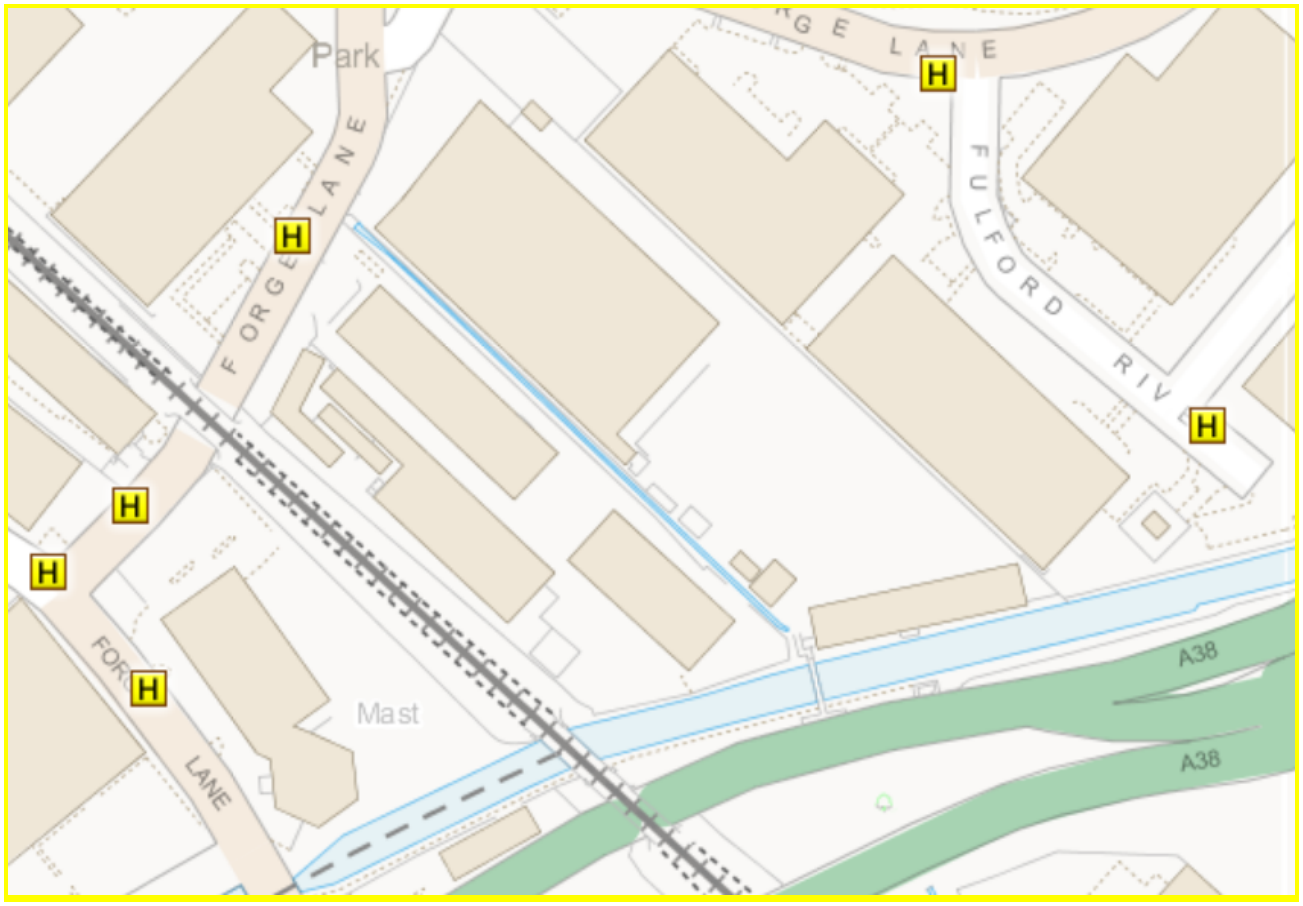
Station name	Address	Crew type	Distance from site (miles)	Journey time
Erdington Fire Station	Orphanage Rd, Erdington, Birmingham B24 9HR	Wholetime	3.1	8
Sutton Coldfield Fire Station	Lichfield Rd, The Royal Town of Sutton Coldfield, Birmingham B74 2NT	Wholetime	4.3	11
Coleshill Fire Station (WFRS)	Park Rd, Coleshill, Birmingham B46 3LA	Wholetime	5.3	13
Perry Barr Fire Station	College Road, Birmingham B44 0HJ	Wholetime	5.8	17

9. Water Supplies

The site will have a 1000m3 fire water storage tank and associated pumping station.
Access will be maintained at the rear of the battery operations building to allow easy access for FRS to the Tamworth and Fazeley Canal at the back of the site. The FRS may then use the light portable pumps (LPP) that are routinely carried on all front line appliances in the West Midlands.

There are no fire hydrants within the site boundary, but there is one adjacent to the entrance gate. The nearest fire hydrants are shown in figure 6 below. The hydrants have been confirmed via West Midlands Fire Rescue Service that they conform to BS 750 2012 and the water company provides a minimum flow guarantee of 8 l/s.

Figure 6. Hydrant Locations



10. Fire Water Management

The yard area is bunded. There is also a 250mm high concrete bund around the battery processing area in the building. All water leaves site via a foul drain that is pumped over the canal to a main foul sewer by the A38 Kingsbury Road.

In an emergency situation, the pump can be turned off with a clearly labelled emergency isolation switch so that water accumulates on site in the bunded areas of the building and yard. The water may then be pumped to the foul sewer on approval from the relevant authorities after testing, or tankered away for off site treatment.

The available containment capacity has been calculated as at least 98m^3 in the yard area. There is an additional 93m^3 which can be contained within the building using a temporary roll out flood barrier. Further detail relating to containment capacity is expected to be available following topographical survey work expected to be completed in Q4 2023 or Q1 2024.

In addition to the available containment capacity on site, tanker shuttling can be used to extract contaminated water during an incident.

Any fire emerging at a Veolia facility is notified to the 24/7 internal business crisis line. This notification triggers a request for tanker capacity to be provided to the Facility immediately as a contingency. Veolia manages the largest in-house tanker fleet in the country with 24/7/365 response capability and therefore has the ability to deploy mobile containment to any site where it is required.

Once in attendance there are several locations which would be suitable for extraction of fire water including several sumps in the yard area.

Once a tanker is full there are multiple disposal sites within range of the Facility which will enable collected fire water to be disposed of and the tanker returned to the Facility.

During a fire, Veolia would also liaise with Severn Trent at an early stage to determine whether elimination of contaminated fire water to foul sewer would be acceptable. If this is the case, a tanker could be allocated to an over pumping function or the existing pump controlling sewer emissions from the Facility could be reactivated.

11. Amenity Issues

The facility is located in a predominantly industrial / commercial area with the closest residential property located approximately 240m to the south of the site off Manby Road.

Key receptors within 1km of the site have been identified and are shown on the 1km receptor drawing Minworth Batteries Receptor Plan 2022v1 and described below.

The facility is located within 100m of the Sutton Park railway line to the South west of the site.

The Birmingham and Fazeley Canal is located a few metres south of the site boundary.

The A38 Kingsbury Road is approx 50m away from the site to the south. The canal is between the site and the A38.

The site is within Birmingham Air Quality Management Area 'AQMA' which is declared for Particulate Matter PM_{10} - 24-Hour Mean, Nitrogen dioxide NO_2 - Annual Mean, Nitrogen dioxide NO_2 - Annual Mean, Particulate Matter PM_{10} - 24-Hour Mean; the source is from road traffic.

There are no schools, care homes or hospitals within 1km of the site.

The site is on a Secondary B aquifer while superficial drift deposits are described as Secondary A. The site is not within a source protection zone 'SPZ'. The closest SPZ is 4.8km away. BGS mapping lists the site as having Medium - High groundwater vulnerability.

Conservation screening shows that there are the following protected species / habitats located within the specified 1km screening distance of the site:

Nature and heritage screening

- Plantsbrook Reservoir - Local Nature Reserve and Local Wildlife Site is 520m west of the site.
- The Birmingham and Fazeley Canal - The canal corridor running immediately south of the Facility is a Local Wildlife Site .
- Minworth Sewage Works - Land within the footprint of the sewage works approximately 1km to the east is designated as a Local Wildlife Site.

There are no other SSSI, SAC, SPA , RAMSAR, LNR or LWS within screening distance.

12. Contingency Measures

In the event of a fire, batteries could remain uncollected for a short period at customer sites. Alternatively, they could be collected and stored at one of Veolia's permitted hazardous waste transfer stations. Alternatively, waste could be delivered to other permitted facilities in the local area, or across the UK.

In the event of the use of water by the FRS, the fire water will be retained on site prior to off site disposal via road tanker, or discharged to foul sewer after appropriate testing. Veolia operates an extensive fleet of waste water tankers with a 24 hour call out availability and these are based locally to the Minworth site.

It will be important to notify neighbours of an incident during their operating hours. In addition to the audible fire alarm siren on the external wall of the main building, contact details of neighbouring businesses will be kept on file as part of the emergency plan so they can be contacted efficiently. All neighbouring businesses have one of two landlords. The majority are managed by CBRE, which has a site office on Forge Lane and this office can also be used to inform neighbours efficiently of any emergency situation.

13. Fire Drills

A fire drill will be carried out every 6 months. Following each drill, an assessment is undertaken and any lessons learned will be implemented. The fire alarm system will be functionally tested every week. A number of the site staff will be specifically trained and appointed as Fire Marshalls.

The fire drill will vary on each occasion and cannot be prescribed in advance. The precise nature of the drill will be decided by the Fire Marshal and operational management based on factors such as perceived risk, incidents at other facilities, experience of staff, consultation with health and safety advisers, etc. The drills will generally be focused around the FPP and Emergency Plan.

14. Emergency Management Plan

Site Name:	Minworth EV Li ion Battery Recycling Facility ABTO Approval: BS2210651BS ABE Approval: BE2210649BE		**Environmental Permit Reference:** EPR/KP3396FQ
Address and Grid Reference:	Forge Lane, Minworth Industrial Estate, Sutton Coldfield, West Midlands, B76 1AH SK 62634 40378		
Operating Hours:	08:00 to 18:00 Mon to Fri		
Facility Type:	Discharge and dismantling of EV Li ion batteries. Sorting of mixed batteries	**No of Staff** **Managers:** **Drivers/Loaders:** **Operatives:** **Office:**	 2 0 0 0
Site Manager:	David Reynolds	**Telephone:**	07788 915076
Route from nearest main junction; Forge Lane from A38 Entrance gate: What3words; loft.winter.bond			
RESPONSIBILITIES/CONTACTS In the event of an emergency/incident contact:			
Emergency Coordinator 1:	David Reynolds	**Telephone:**	07788 915076
Emergency Coordinator 2:	Adam Koltuniak	**Telephone:**	
Area Manager:	Nicola Henshaw	**Telephone:**	07687 163208
Business Line Director:	Bernat LLorens	**Telephone:**	07780 228941
QHSE Manager:	Mike Hendry	**Telephone:**	07880 476078
Crisis Hotline:	**0845 071 0755**		
Emergency Spill Response:	**0800 783 8020 (day)** **08000 282 821 (24hr)** **0800 626 274 (24hr)**		
Emergency Services Direct Dial:	**999**		

15. Management System

Veolia ES (UK) Ltd has a detailed management system which is audited to the three main standards, ISO 9001, ISO 14001 and OHSAS 18001.

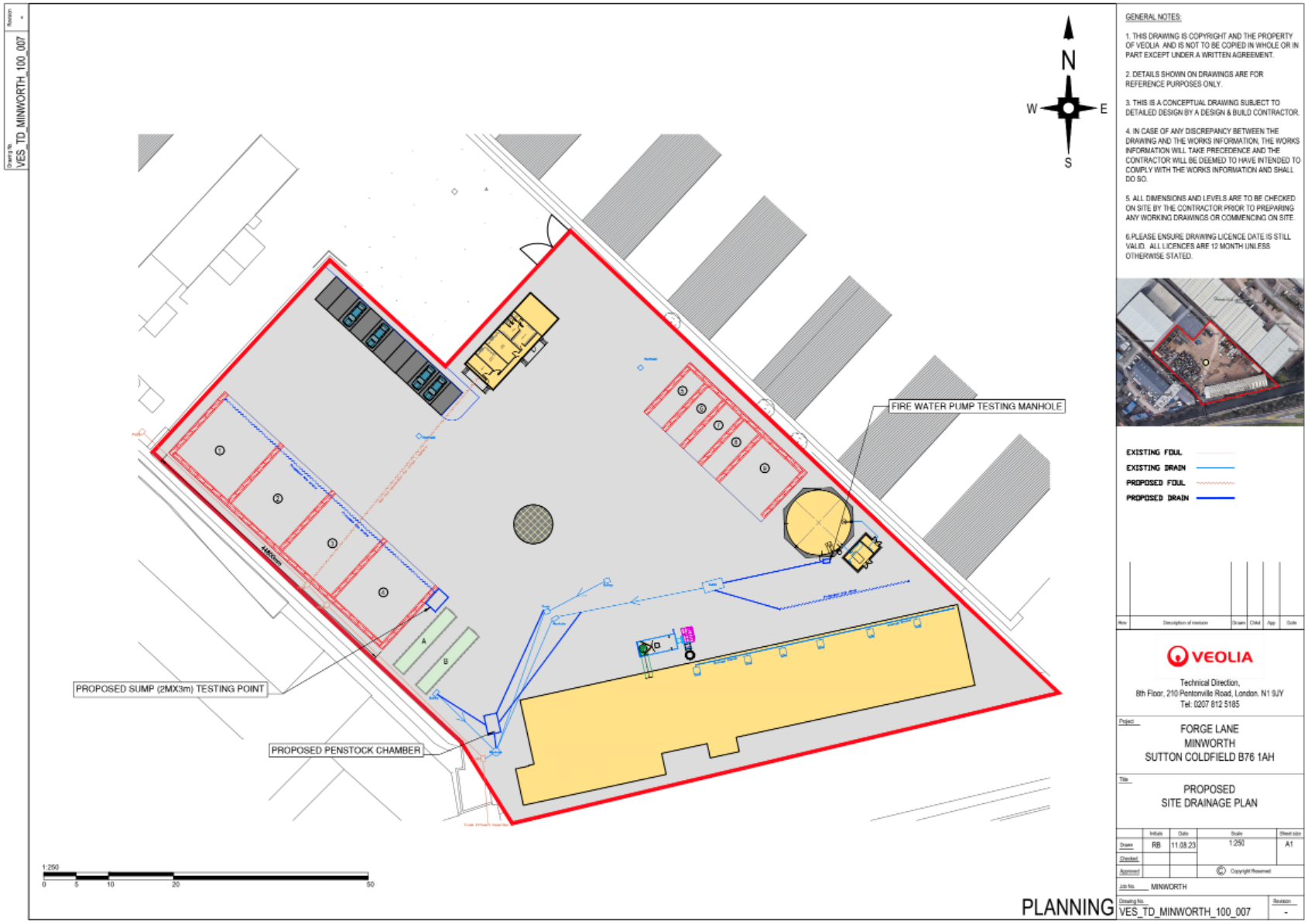
The following documentation should be considered during any planning, reviewing or auctioning of the above plan.

Table 5 - key management system documents and references

Document Name	Description	Reference Number
Environmental Aspects/Impacts Register	A review of the site and its operations to calculate its impact on the environment using a matrix scoring system. By highlighting any risks, measures are implemented to reduce the risk	ENV/2/004/001
Register of Significant Environmental Aspects	A summary of the above with relevant control methods assigned to each point	Local
Objectives & Targets	Continual improvement register undertaken by each contract. Local objectives set including environmental targets	SYS/2/003/001
Monitoring and Measurement of ENV performance	This document establishes the overarching procedures for monitoring and measuring Environmental Performance. It also outlines the process for ensuring alignment with VES corporate requirements	ENV/2/002
Environmental notification system	This procedure sets out the process by which employees may identify health, safety and environmental concerns and near misses. It is not mandatory but may be used to record matters where immediate access to AVA is not available. It also provides a mechanism for providing feedback to the originator of the concern / near miss	HS/2/31
AVA	AVA is Veolia's online reporting tool for observations, accidents, incidents and near misses. This tool is also used to	NA

	register site visits from recognised authorities. Permit reviews are also undertaken via this portal. All reports registered are monitored via the QHSE department, department heads and regional directors.	
Regulatory Documents	These included WML, Permits and exemptions as well as working plans	Local
Business Continuity Plan	This document covers the most significant impacts that could occur with recovery time objectives set against each activity type as to ensure compliance with regulatory authorities whilst minimising business disruption. The plan is reviewed yearly or earlier if it is needed to be activated and is subject to plan exchange and drills.	SYS/2/028/001

16. Site Plan


VES_TD_MINWORTH_100_007
N
W
E
S
FIRE WATER PUMP TESTING MANHOLE
PROPOSED SUMP (2MX3m) TESTING POINT
PROPOSED PENSTOCK CHAMBER
1:250
0 5 10 20 50
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4. IN CASE OF ANY DISCREPANCY BETWEEN THE DRAWING AND THE WORKS INFORMATION, THE WORKS INFORMATION WILL TAKE PRECEDENCE AND THE CONTRACTOR WILL BE DEEMED TO HAVE INTENDED TO COMPLY WITH THE WORKS INFORMATION AND SHALL DO SO.
5. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PREPARING ANY WORKING DRAWINGS OR COMMENCING ON SITE.
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EXISTING FOUL
EXISTING DRAIN
PROPOSED FOUL
PROPOSED DRAIN
VEOLIA
Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
Tel. 0207 812 5185
FORGE LANE
MINWORTH
SUTTON COLDFIELD B76 1AH
PROPOSED
SITE DRAINAGE PLAN
RB
11.08.23
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MINWORTH
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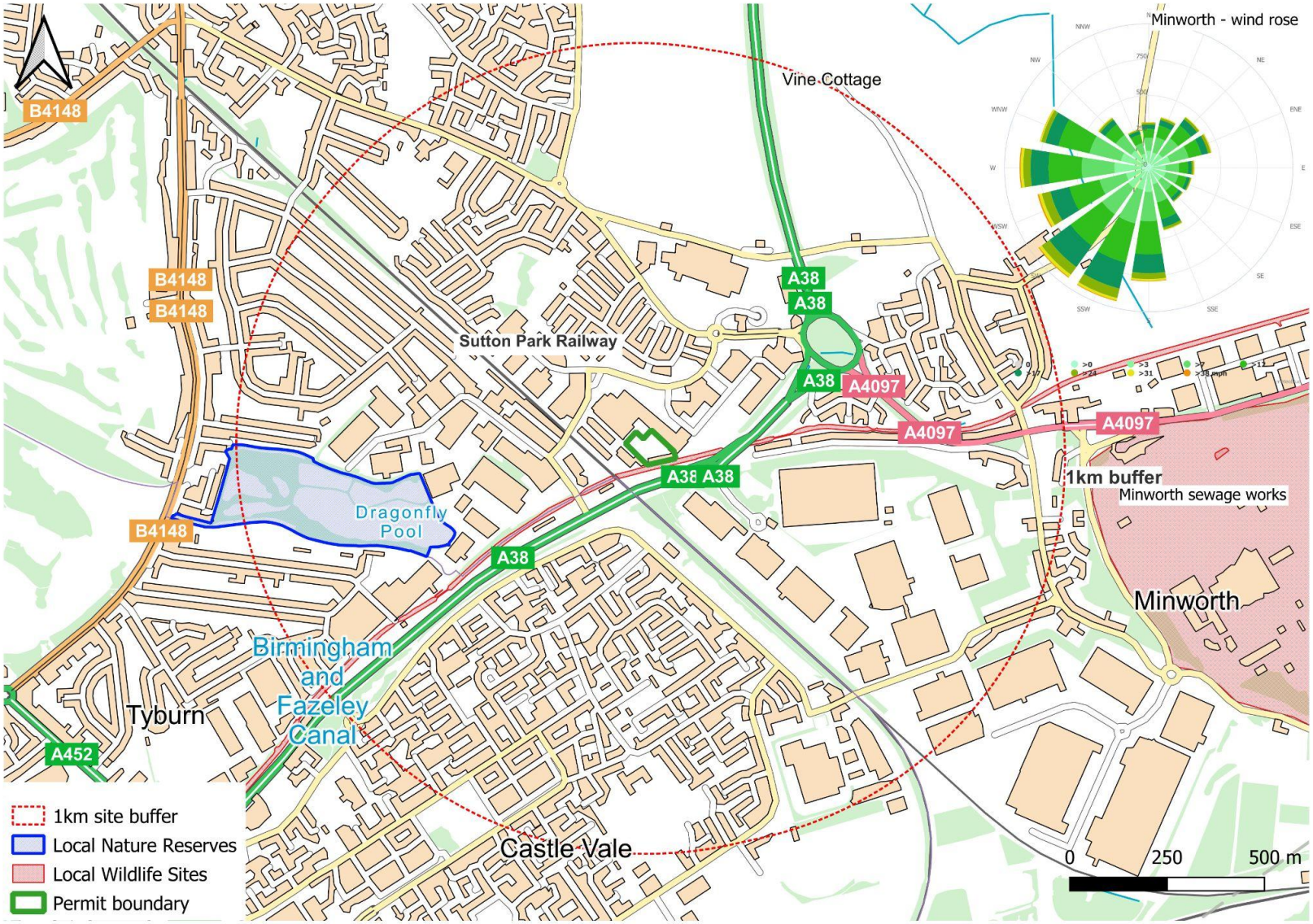
PLANNING

17. Receptor Plan



18. Fire Water Containment

Estimated Water Volume Storage Summary

- <AOD 89.71 Volume 19m3
- <AOD 89.77 Volume 40m3
- <AOD 89.82 Volume 98m3

- Inside building
  AOD 89.82+250 bund+
  sealed doorways
  Additional volume 93m3