S L Recycling Limited

Compliance Audit Report

Address: Unit 1, Pontyfelin Industrial Estate, Pontypool, Torfaen NP4 0DQ

Permit: EPR-BB3299FN

Area: South East Wales

NRW Officer: Alex Bowder

Date: 11 August 2022

CONTENTS

This compliance audit report details the evaluation process and physical inspection conducted by Natural Resources Wales (NRW) Officers between 12 July and 11 August 2022 at S L Recycling Limited, Unit 1, Pontyfelin Industrial Estate, Pontypool, NP4 0DQ - Permit number ***EPR-BB3299FN.***

1. AUDIT SCOPE

To examine the operational documents, procedural activities and control measures implemented on site for the treatment methods relating to the waste metal shredding process carried out under permit ***EPR-WP3799FB*****.** It will consist of:

(i) Assessment of the Environmental Management Systems and associated procedural documentation
(ii) Physical site inspection to evaluate working methods and whether activities are being appropriately implemented in-line with operational procedures
(iii) Analysis of the control measures used by operator personnel
(iv) Review and report of the audit findings with set out corrective actions
(v) Tracking of actions to ensure that requests have been understood and implemented

The purpose of the evaluation is to determine:

- the extent to which site activities comply with permit conditions;
- the extent to which site provisions are being implemented effectively;
- whether the procedures are suitable to achieve compliance objectives with regard to reducing the risk of deflagration events and;
- the work fields that can be improved to better achieve compliance.

2. AUDIT OVERVIEW

Over the past twelve months, S L Recycling Ltd have experienced a number of deflagration events that have occurred within its metal shredder equipment. The aim of this compliance exercise is to assess the site procedures currently taking place, and to review the management systems to identify any root causes that could have contributed to the occurrence of deflagrations. A review of the relevant documents and on-site procedures has been carried out to highlight areas for improvement to assess their effectiveness in achieving environmental outcomes.

The report includes reference to Best Available Techniques (BAT) with regard to permitted metal shredder installations. This is with a view to compare the waste treatment activities taking place across other industrial metal shredders in the UK that are processing higher tonnages of scrap. This is useful to understand what techniques are routinely being implemented at these sites, and

what methods are most effective at reducing and addressing deflagrations.

The overarching goal of the audit is to reduce the frequency of deflagration events through improving the operational treatment processes on site.

A summary of required **actions** for completion with respective deadlines is listed at the end of the document.

ENVIRONMENTAL PERMITS
The operator currently holds two Standard Rules Permits:

- **SR2008 No3** - Household, commercial and industrial waste transfer station with treatment and;

- **SR2012 No 14** - Metal recycling, vehicle storage, depollution & dismantling (authorised treatment) facility

Bespoke Permit Application - PAN-016333
As set out in condition Table 2.1 activities:
Treatment methods consisting only of manual sorting, separation, screening, baling, shredding, crushing or compaction of waste into different components for disposal or recovery are the only allowed means of processing. This is accompanied with Table 2.3 that states, unless stored or treated outside as a specified waste, this activity needs to be carried out inside a building.

The site has submitted a bespoke waste permit application to encompass the Standard Rules conditions and include the outside treatment of waste/wood processing. This has also been accompanied with the submission of third-party Noise Impact Assessments conducted for the intended activities. This application is currently being determined by the NRW permitting department.

KEY PERMIT CONDITIONS

- 1 - Management
  General Management
  1.1.1 The operator shall manage and operate the activities:

    a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non- conformances, closure and those drawn to the attention of the operator as a result of complaints; and
    b) using sufficient competent persons and resources.

- Table 2.1 activities
  2.3 Operating techniques

- Emissions
  3.2 Odour
  3.3 Noise and vibration

- 3.4 Fire

3.4.1 The operator shall manage and operate the activities in accordance with a written fire prevention plan using the current, relevant fire prevention plan guidance.

- 4.3 Notifications

  4.3.1 Natural Resources Wales shall be notified without delay following the detection of:

  a) any malfunction, breakdown or failure of equipment or techniques, accident or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution.

LEGISLATION

- Environmental Permitting (England and Wales) Regulations 2016
- Environment Protection Act 1990
- Hazardous Waste Regulations 2005
- Waste Electrical and Electronic Equipment Regulations 2013
- End-of-life Vehicles Regulations 2003
- End-of-life Vehicles (Producer Responsibility) Regulations 2005

DOCUMENTS AND EVIDENCE REVIEWED

The audit intends to review the below listed contents for assurance of: (i) evidence of compliance, (ii) sound working site procedures, (iii) staff awareness, (iv) environmental outcomes, (v) achievement of objectives and (vi) targets and continual improvement:

- Environment Management System (EMS)
- Noise Prevention Plan (NPP)
- Dust Management Plan (DMP)
- Fire Prevention and Mitigation Plan (FPMP)
- Staff Training logs
- Metal Shredder Specifications (emails)
- Bonfiglioli Drake Hammer Risk Assessment
- Bonfiglioli Drake Hammer Safe Working Procedure
- Safe Working Procedure - Hammermill
- Lock out tag out - Hammermill
- Gas Bottle Warning
- Prohibited Item List 2022
- Gas Cylinder explosion debriefs - 1 September 2021, 9 November 2021, 30 November 2021, 26 April 2022, 6 July 2022
- Noise Impact Assessments
- CCTV Footage

TERMINOLOGY

The technical definitions mentioned in this report are defined as:

- Deflagration - a combustion event which propagates through a gas at subsonic speeds, driven by the transfer of heat

- Explosion - a rapid expansion in volume associated with an extremely vigorous outward release of energy, usually with the generation of high temperatures and release of high-pressure gases

Metal treatment:

- Shearing - the reduction in the size of metal by cutting and pulling apart. Some pieces of scrap are too big to be easily reprocessed

- Baling and compacting - a compressing force that makes waste material denser. Some scrap must be moved to larger processing plants and baled to aid stacking for transportation

- Shredding - the reduction of waste material down to fist-sized lumps of metal using highly efficient shredding machinery. The shredding process also aids in the separation of ferrous from non-ferrous metals and other materials like rubber, plastics, and fabrics.

TECHNICALLY COMPETENT MANAGER (TCM)

Becky Tucker is the nominated TCM for site who holds a WAMITAB qualification with completed modules for a non-hazardous transfer station, certification expiry 4 May 2023.

Please remember to complete continuing competency refresher course every two years to maintain an effective status.

3. PERMITTED SHREDDER INSTALLATIONS

In the UK, there are around 25 metal shredder installations operated - 16 in England, 8 Scotland and 1 in Wales. The Environmental Permitting Regulations (England and Wales) Regulations 2016 Schedule 1, Part 2, Chapter 5, Section 5.4. Part A(1)(b)(iv) dictates that a permitted waste treatment becomes an installation when:

*"Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding **75 tonnes per day** (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC:*

i. biological treatment;
ii. pre-treatment of waste for incineration or co-incineration;
iii. treatment of slags and ashes;
iv. treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components."

The average daily metal processing rate of the site was questioned - this was said to be around 40-50 tonnes a day. The operator must be mindful about exceeding this threshold, as it would require a variation to an installation permit along with the necessary local planning consents.

INDUSTRIAL EMISSIONS DIRECTIVE 2010/75/EU

Best Available Techniques Reference Documents (*BRef*)

The *BRef*s are a series of reference documents covering the industrial activities listed in Annex 1 to the EU's Integrated Pollution Prevention and Control (IPPC) Directive. They provide descriptions of a range of industrial processes and their respective operating conditions and emission rates.

The *BRef* for waste treatment is valuable to explore when operating a shredder that has the

potential to have deflagration events. It can be used as the primary tool, should deflagration events become an issue at a permitted installation. Whilst best available techniques do not apply to permitted waste sites (and cannot be regulated against compliance), these techniques are the recommended practices that should be followed when operating a shredder of similar processing specification. It is useful to identify what measures could also be implemented even for lower waste treatment capacities (< 75 t per hour) such as those currently being run at the S L Recycling New Inn yard.

BAT 26 states that, in order to improve the overall environmental performance, and to prevent emissions due to accidents and incidents, BAT is to use all of the techniques given below:

i. implementation of a detailed inspection procedure for baled waste before shredding;

ii. removal of dangerous items from the waste input stream and their safe disposal (e.g. gas cylinders, non-depolluted ELVs, non-depolluted WEEE, items contaminated with PCBs or mercury, radioactive items);

iii. treatment of containers only when accompanied by a declaration of cleanliness.

In order to prevent deflagrations and to reduce emissions when they occur, BAT is to use the three techniques below:

1. Deflagration Management Plan (DMP)

It is recommended for the operator to create a standalone management document that address the procedures that should be followed to reduce the risk of deflagration incidents. This should include:

- a deflagration reduction programme designed to identify the source(s), and to implement measures to prevent deflagration occurrences, e.g. inspection of waste input and removal of dangerous items as described in;
- a review of historical deflagration incidents and remedies and the dissemination of deflagration knowledge;
- a detailed protocol for response to deflagration incidents.

This could be an element of the Noise and Vibration Management Plan which address deflagrations, however, should contain more tailored information relating to pre-treatment methods and the use of the shredder.
The operator currently does not possess a plan that specifically addresses deflagrations.

2. Pressure Relief Dampers

Another technique used in installations sites is pressure relief dampers. This is a heating, ventilation, and air conditioning (HVAC) damper used in areas experiencing a build of pressure and requiring release of this excess pressure at regular intervals, in one direction. The release of this excess helps maintain or control the pressure in the zone, area or even inside the duct thus preventing the duct from damage. These are installed to relieve pressure waves coming from deflagrations that would otherwise cause major damage and subsequent emissions.
The operator currently does not have this measure installed; however, it is unknown whether it is possible to modify the shredder as to include this mechanical feature.

3. Pre-shredding

This is the use of a low-speed, slow rotating shredder installed upstream of the main shredder unit. Pre-shredders are generally installed as part of the shredding system to prepare the material

for entry into the primary shredder hopper. Adding a pre-shredder to the metals process allows the operator to control the feed rate, leading to a more uniform flow of material through the shredder itself, and a higher density product. This would improve the efficiency of the treatment process and give approximately 15% more production. Waste metal operators recognize the enhanced value that pre-shredder machinery provides through operational efficiencies, reduced downtime, quality throughput and lower cost per ton processed. Moreover, pre-shredders can decrease the noise pollution commonly associated with unshreddables and explosions in the primary shredder.

In addition, pre-shredders can be helpful to scrap yard operations that have existing shredders that are too small to handle high-density bales or for operations that have aging shredders that are prone to break down more frequently. This can improve the wear life on the primary shredder's castings, protect against unshreddable or explosive materials and reduce peak power loads to the shredder.

The operator currently does not possess a pre-shredder unit.

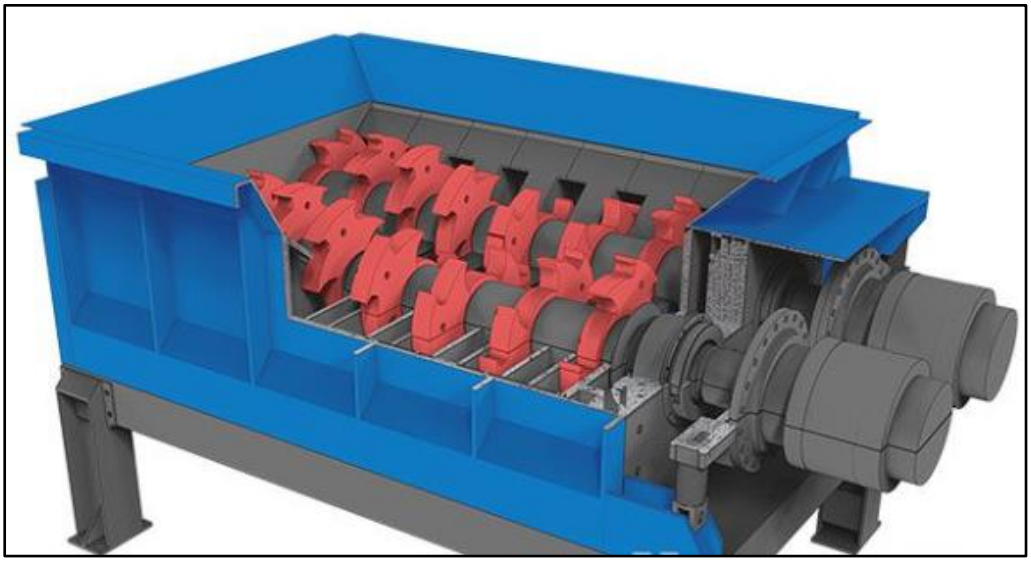


Diagram illustrating a typical pre-shredding unit with slow-rotating gears

4. GOV.UK GUIDANCE

Treating metal waste in shredders: appropriate measures for permitted facilities

Emissions Control Appropriate Measures

These are the appropriate measures for emissions control at regulated facilities with an environmental permit to mechanically treat metal waste in shredders. The operator should be following and implementing these measures.

Waste treatment plant (including shredders) must be contained to ensure collect, extract, and direct all process emissions to an appropriate abatement system for treatment before release.

Sites must use 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

Deflagration Management
To prevent deflagrations and to reduce emissions where deflagrations have occurred, a Deflagration Management Plan (DMP) is required. 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

Where there are a large number of deflagration incidents at a site, and other measures taken do not reduce the number, **a pre-shredder may be required.**

ACTION
Create a Deflagration Management Plan that addresses the procedures that should be followed to reduce the risk of deflagration incidents. Submit to NRW for review.

EMISSIONS OF NOISE AND VIBRATION

The following points are what the operator should be carrying out to address any impacts from emissions:

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

2. Use appropriate measures to control noise, including for example:

- adequately maintaining plant or equipment parts which may become noisier 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

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 EMS, and include:

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

4. The Noise and Vibration Management Plan should also include a noise and vibration reduction programme designed to:

- identify the source(s) of noise and vibration
- measure or estimate noise and vibration exposure
- characterise the contributions of the sources
- implement prevention and reduction measures

5. Where a Noise Management Plan is required, you must develop and implement it following the noise management plan guidance.

5. DEFLAGRATION INCIDENTS

Over the past twelve months, there have been five deflagration events involving a compressed gas canister or bottle being fed into the metal shredder machine which caused an explosion to occur within the shaft of the unit. For each respective event, NRW received multiple reports to the Incident Communications Centre (ICC) detailing the incident and the impacts sustained to the nearby residential areas and wider local community. These events understandably are a cause for concern to reporters due to the proximity of residential dwellings to the site, and the increased magnitude of the shock wave discharge that is felt, generated from a blast propagating out of the permit boundary.

Frequency of Deflagrations

The average tonnages currently being processed at the site daily is said to be around 40-50T. *BRef* states that around 2.5 deflagrations per 10,000T is the average statistic of permitted sites used in the development of the guidance. The operator's current shredding rate, relative to the number of incidents that have occurred, is above the expected industry threshold.

For example - in 2021-22, a metal site that processes up to 500T of scrap a day has only experienced one deflagration incident for this period. Whilst a direct comparison cannot be made due to the differences in machinery specification and infrastructure, it indicates a large variant between the statistics. Therefore, the operator must address this through improving its working procedures and management systems to reduce the frequency of deflagrations with immediate effect.

Bref states that where there is a large number of deflagration incidents a **pre-shredder** may be required.

INCIDENT SUMMARIES

Below is a summary of the shredder deflagration incidents:

1 September 2021
S L Recycling site workers failed to identify and remove a gas bottle that was fed into the shredder which led to a deflagration within the shredder. The South Wales Police and the Fire and Rescue Service arrived at the site shortly after the report due to the high number of calls received to their emergency service line. No further action was given from them, services left shortly after. Usual pre-checks were carried out - the canister was said to be concealed and unviewable to staff workers. The operator claimed this to be an isolated incident and a disciplinary action was issued on the supplier by the TCM. Reminder letters were sent to logged customers/suppliers with regard to the strict 'no gas bottle' policy.

The operator set up a quarantine area within the yard to store extracted gas cylinders and initiated staff training refreshers to workers. TCM implemented extra control measures on site and carried out toolbox talks to raise awareness. This was highlighted as a training issue, which started stricter procedural checks through the observation points and spreading waste out thinly on the yard surface to inspect for unshreddables.

9 November 2021
The operator experienced another loud blast event within their metal shredder plant. It was detailed that the site foreman failed to identify and remove a gas cylinder situated within the shredder feedstock pile as per site procedures, which was consequently fed into the plant hopper and caused the discharge. Following this event, a NRW site inspection scheduled to evaluate noise mitigation measures and discuss the event with the operator. CAR Form issued with actions.

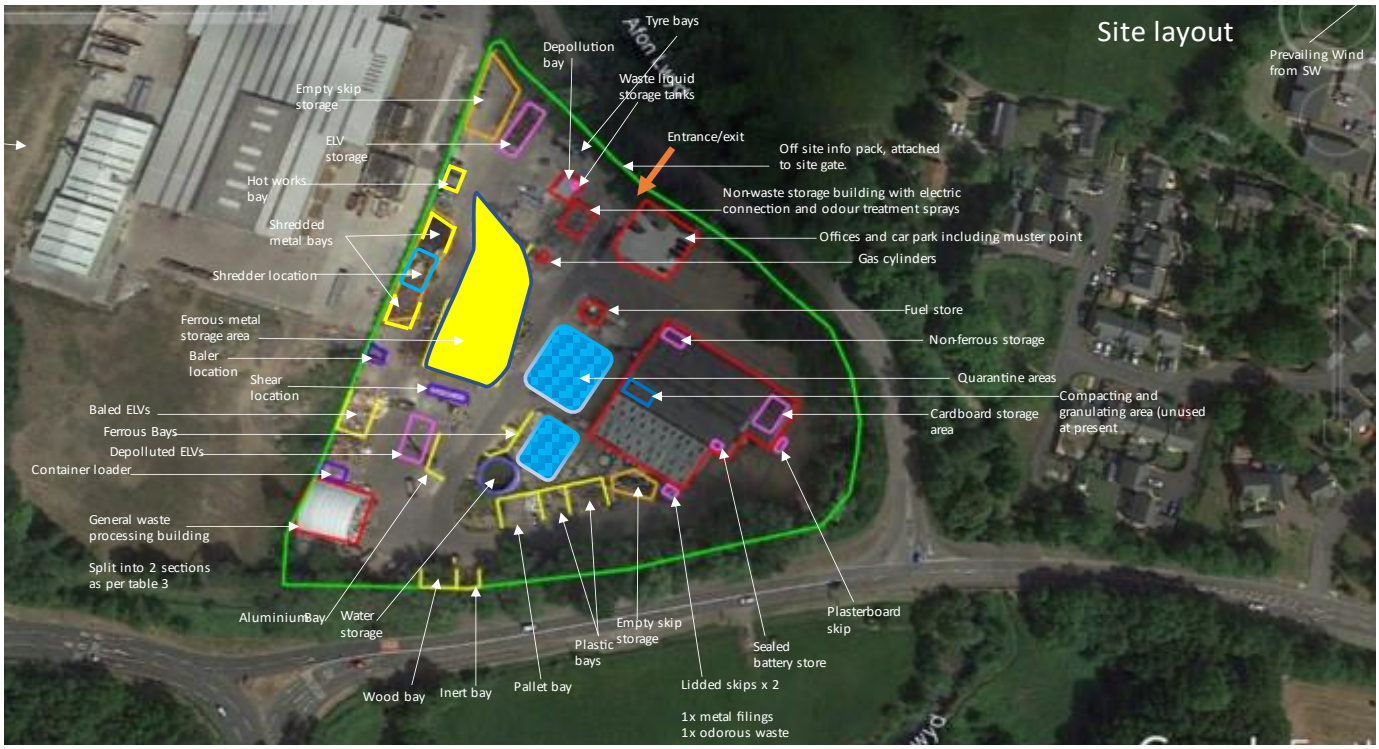
30 November 2021
Staff failed to identify and remove a gas bottle that was fed into the shredder. Root cause was that the nominated grab operator was in intensive care with Covid-19, and so a temporary person was placed on the loading machine who failed to comply with their control measures. This employee was dismissed with immediate effect and a competent operator was instructed to fulfil the position until the usual operator recovered. The HSE issued an improvement notice to the operator that required the creation of clear walkways across the site and work areas. There were no issues declared with the shredder plant itself, or the operation of it by site workers.

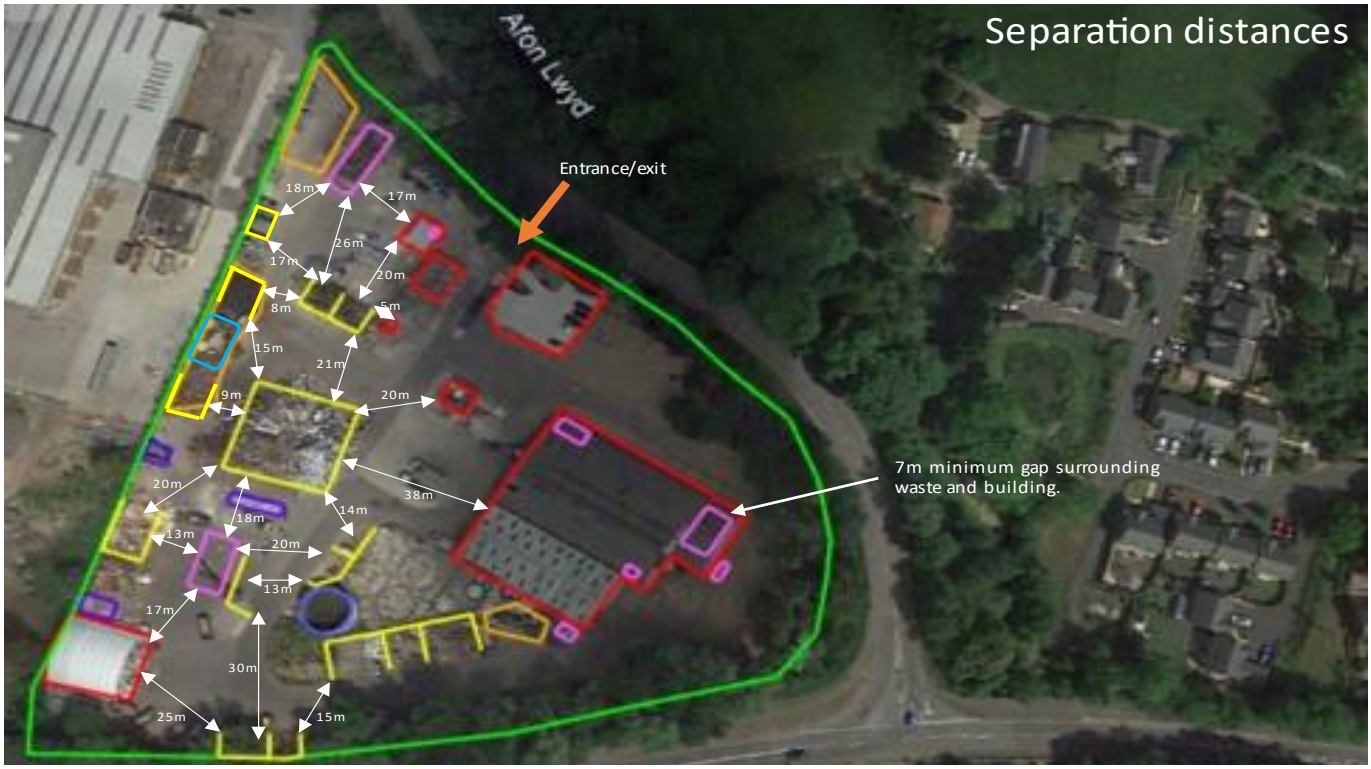
26 April 2022
Staff failed to identify and remove a gas bottle that was fed into the shredder. NRW Officer requested shredder machine specifications, on site working procedures, training logs, pre-check lists and risk assessments related to the shredder. All procedure documents requested and received.

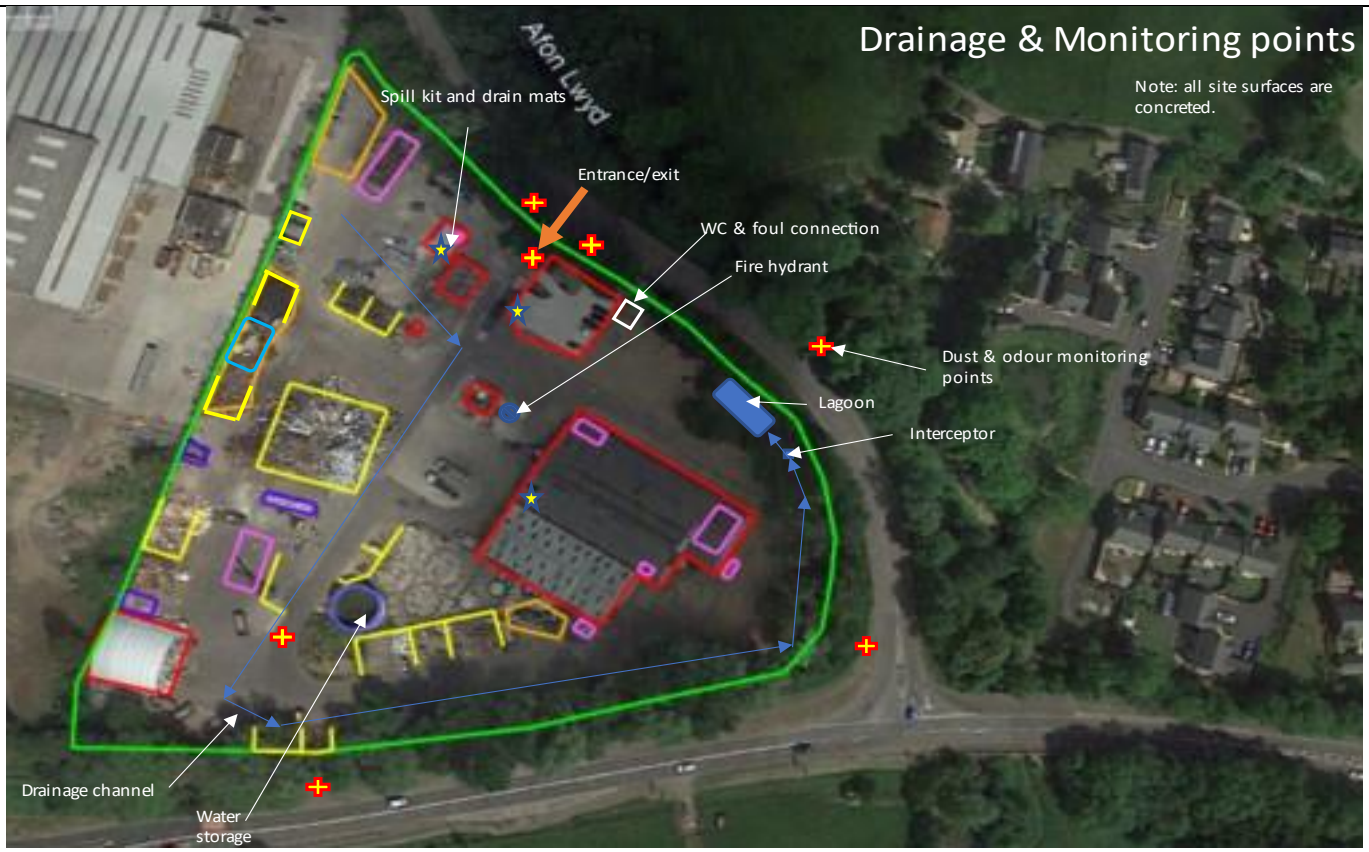
6 July 2022
At 10:45, the operator experienced another loud blast event within their metal shredder plant. Site foreman failed to identify and remove a gas cylinder situated within the shredder feedstock pile as per site procedures.

18 July 2022 (non-deflagration)
NRW received reports of a large blast experienced in the local community. The operator was contacted immediately after the reported event, and it is evident that the noise experienced was not a deflagration or explosion event from the metal shredder plant. The noise was generated from a lorry holding hook snapping which caused a thirteen-tonne metal roll-on/roll-off container to drop onto the solid yard surface.

6. SITE PLANS


Site layout
Prevailing Wind from SW
Tyre bays
Depollution bay
Waste liquid storage tanks
Empty skip storage
ELV storage
Entrance/exit
Off site info pack, attached to site gate.
Hot works bay
Non-waste storage building with electric connection and odour treatment sprays
Shredded metal bays
Offices and car park including muster point
Gas cylinders
Shredder location
Fuel store
Ferrous metal storage area
Non-ferrous storage
Baler location
Quarantine areas
Shear location
Compacting and granulating area (unused at present
Baled ELVs
Cardboard storage area
Ferrous Bays
Depolluted ELVs
Container loader
General waste processing building
Split into 2 sections as per table 3
Aluminium Bay
Water storage
Plasterboard skip
Empty skip storage
Plastic bays
Sealed battery store
Wood bay
Inert bay
Pallet bay
Lidded skips x 2
1x metal filings
1x odorous waste


Separation distances
Afon Lwyd
Entrance/exit
18m
17m
17m
26m
20m
8m
5m
15m
21m
9m
20m
20m
38m
14m
18m
13m
20m
13m
17m
30m
25m
15m
7m minimum gap surrounding waste and building.



7. AUDIT INSPECTION - 12 JULY 2022

Senior Environment Officer Alex BOWDER (AB) attended S L Recycling at 10:00 to conduct an audit of the waste metal treatment procedures on site following the deflagration incident that occurred on 6 July 2022. Stacey LEWIS (Director), Becky TUCKER (Technically Competent Manager), and Environmental Focus Consultant Gareth HILL were present for the meeting. Becky left the site the beginning of the inspection, S LEWIS and G HILL later accompanied the Officer AB around the permitted area to inspect the various work areas. Weather conditions were warm and dry at the time of inspection with no surface water witnessed to be pooling.

First, Officer AB requested to start discussions in the site office to outline the scope of the audit, and to explain the focus of the exercise and expected outcomes thereof. The discussion comprised of eight sections where the below topics were interrogated:

1. Staff Training

- Staff in control of shredder input and pre-loading checks
- Implementation of staff training, frequency of training schedules, refresher training, recording/documenting methods
- Staff absences and working hours
- Equipment maintenance

On the site, there is one fully trained staff member who operates the machine grabber responsible for physically loading the material into the hooper. Other workers conduct the waste pre-checks, for which there are multiple members that can perform this task. Staff are trained to use the

various site equipment and plant when they join the company. This is done via verbal training and on the job shadowing. Training is maintained though weekly toolbox talks conducted by TCM.

If the machine grabber is absent, then the shredder will not be operated. This is because not all staff are competently trained to operate the grabber, which would naturally present various problems. If the TCM is absent, the Site Manager will assume control of operations. Appropriate PPE is worn at all times by staff.

Following an incident (such as a deflagration), training is implemented by TCM to workers. Staff reminders are given to raise awareness and the importance of the pre-checking and segregation process. It was stated that these should be routinely scheduled and logged by the operator.
The Officer asked surrounding training logs and how these are checked - TCM conducts such activities.
The operator has stated that various staff members have been dismissed following deflagration events - stated that this act is a business decision and not required or enforced as part of permit conditions.

Staff are aware of the site working hours. Operator reminded to be wary that starting machinery ready for processing prior to opening hours (08:00) has potential to cause noise disturbances, despite not being a formal breach of the waste permit conditions.

The shredder area is routinely maintained throughout the day and is cleared to a reasonable standard at the end of the shift (around 16:00) ready for next-day processing. This is to ensure that there is no clutter and will assist with increasing the likelihood of spotting unwanted wastes. Staff workers are aware of the management system documents, however these are not read or consulted. This is something that the TCM should explore to fortify the importance of site procedures, and the expected working standards that staff should be adhering to in order to achieve permit compliance. This could be done by periodically talking staff through the operational documents, for instance.

2. Management and Operational Procedures

- Waste acceptance and pre-loading checks
- Observation points and material inspection
- Waste acceptance processes
- Traceability and accountability

The operator has various documents relating to the pre-checking and segregation methods on site. However, they are somewhat limited in their information on visual inspection and the overall pre-checking processes. From the moment material enters the site, there are four observation points to identify and reject/remove unwanted materials. There is no clear, documented process that sets out this way of working. Therefore, the operator should elaborate on its current EMS/shredder procedure documents to create a suitable plan or include in a new DMP.

Having questioned the waste checking activities with S L management, this flowchart demonstrates what is currently being carried out on site:

WASTE CHECKING PROCESS

Third-party supplier or S L vehicles enter site to first weigh material and then deposit in the yard before central stockpile. Waste visually observed when tipped to check for inappropriate materials

↓

Material spread out thinly on the surface and visually inspected. Inappropriate items are removed, segregated, and quarantined at first stage of checking

↓

Material added to the primary stockpile or moved to the appropriate storage area. Staff constantly observing piles for any sign of gas bottles/unshreddables

↓

Material is spread out again on yard surface in front of the mill to visually inspect for unsuitable items i.e. gas bottles, canisters, air bags

↓

Foreman operating the grabber picks up waste metal from this pile and feeds into the shredder hopper

↓

Foreman does not overload hopper with material, waits for appropriate window before proceeding

It is evident that the operator is implementing practical control measures on site to prevent unwanted wastes entering the shredder feedstock. The officer talked through the various checkpoint stations and what occurs/how the staff are checking for inappropriate items. Officer was shown the gas cylinders removed and quarantined as a result of the checks that are taking place. As there is no mechanical means to 'x-ray' material to check for canisters, the waste checking process must be strictly (and consistently) followed at all times to ensure that any risk is reduced.

The operator does not put depolluted ELV shells or compacted vehicle elements through the shredder, as canisters can be easily concealed within seat cavities (or in the boot), for instance. Bales are compacted, storage and then transported off site for sale. If a customer is identified as depositing unsuitable materials or gas bottles, then protocols are followed to inform and issue them with a letter/fine/ban.

Noise Management Plan
The operator's current plan should contain more information on the management of noise, and day-to-day activities that have the potential to cause noise emissions.

Section 5 Incidents and Emergencies - does not address deflagration events. The operator must create a separate DMP for the deflagration incidents, as this is not currently covered in this document.

Notification
Incident Reporting Form - following each loud noise event, the operator sends a debrief summary that contains information on the event details, involved persons, injury. Please would the operator always ensure that NRW are notified immediately after an explosion event to account for the occurrence, in line with permit conditions. This should be done as a priority to notify NRW of the incident details to enable communications to be provided to various stakeholders.

3. Improving Waste Input Checking

- Observation points and visual inspection
- Checks/correspondence with waste suppliers
- Location and intention for removed and quarantined canisters

It is evident that waste segregation is the primary way to remove unwanted materials from entering the shredder. Visual inspections are conducted at various observation points, and staff check for wastes with cavities that could potentially conceal canisters. Any identified unwanted materials are immediately flagged and taken to the caged quarantine area. Gas cylinders are de-gassed (if possible) or taken to appropriate contractor for further processing.

These bottles have the potential to be ignited and be explosive if subjected to heat or penetration. Therefore, the necessary measures must be taken to safeguard against any fire risk. Canisters are currently stored a lockable mesh-metal cage on appropriate infrastructure with adequate distances from neighbouring piles or buildings - this should be continued.

An advisory note to completely enclose the cage, as the currently only four-sided with the roof exposed.

Image - showing quarantined gas cylinders removed from waste stockpiles

The operator sends reminder letters to customers after a deflagration and issues fines in line with the company policy. This is stated to be £250 per cylinder and carry a one week ban from tipping materials - there has been one company issued with a ban. No responses are received back from the letters sent, Officer questioned whether this should be requested for acknowledgement and the possible benefits in highlighting the importance of the issue to suppliers.

4. Bonfiglioli Drake Shredder

- Shredder specifications
- Repairs and maintenance
- Issues with shaking of ground and contaminated underlayers

Shredder Specifications

In spring 2021, the operator purchased a Bonfiglioli Drake Shredder series to replace the shearer equipment that was the primary treatment method for the metal on site. Shredding metal gives a higher quality metal product by reducing its size through mechanical means.

The shredder plant comes equipped with a diesel engine, larger feeder box, bronze encased heavy duty bearings, Hardox 500 HS steel frame, vibrating exit plant, automatic clutch system, rotating drum magnets, interchangeable grid system, oscillating conveyors, dust exhaust system, air and water filtration and an eddy-current system.

Technical Data

- Hammer Weight: 116 KG 255.7 LB
- Dimensions LxWxH MM (FT): 35500 x 19075 x 5057 116.5’ x 62.6’ x 16.6’
- Processing Capacity: 10-12 TDNNES/HDUR 11-13 Tons/Hour
- Power Options Diesel/Elect.: 600 HP Diesel Engine

- Average Fuel Consumption: 60-65 Liters/Hour (15.8-17.2 Gal/Hour)
- Aspiration Plant: 5 Outlets Ø 40CM (15.7)
- Hydraulic Plant: Working Pressure 250 Bar (3625.9 psi)

The equipment is designed and manufactured to cope with (and best contain) deflagration events. The plant consists of a loading hopper which is built using high strength steel Hardox 500, a central body with a shaft, hammers, and grids. The central shaft is built using 8" high strength steel Hardox 500 which make it almost impossible for debris to leave the chamber due to the forward-facing grids, plates, guards, and blades. These specifications were specifically designed to contain unsuitable material entering the machine input.

The operator has installed steels debris nets and guards around the hopper as precaution, and line workers are shielded in steel boxes. There is a red zone around the perimeter of the shredder to stop unauthorised access.

Image – showing shredder area with waste metal deposited around the machine

On a typical day, the machine is operated between 08:00 and 16:00 and is started up prior to the processing activity - which takes around 5-10 minutes. Again, the operator was reminded to adhere to operating times and not start processing before 08:00. The area is cleared at the end of the day to ensure adequate free space for next-day manoeuvring and depositing (to aid visual checking).

The points surrounding the historic ground contamination of the yard were raised, and whether there were any environmental concerns with regard to the use of the shredder disturbing the settled layers. It was stated that the shredder plant in set 4m deep thick of reinforced concrete.

Any blast experienced is contained within the hopper, and the shock absorbers on the base of the plant should dissipate vibrations and prevent any significant force reverberating into ground layers. On inspection, no cracks or fractures were noted to have penetrated the surface around the plant.

Image - showing the left side of the metal shredder area clear of residual materials

5. Contingency Plans

It is imperative to have contingency strategies in place for all areas of the business to safeguard unforeseen circumstances that could affect operations, and to ensure that permit conditions are complied with. You should be able to state how the site will operate if unforeseen circumstances arise, such as:

- Extreme weather, machinery breakdowns, drainage or infrastructure failures, key personnel off, waste outlets issues and associated material management.

Any situation that potentially could disrupt everyday operations should be identified and listed. You must consider what controls you will implement if an event does occur:

- How will this affect storage of materials on site, how will you mitigate risks, how will you manage waste volumes with material coming into site, and list contacts in an emergency.

Current operational documents lack information on this, and so should be reviewed to account for all instances of the above.

6. Health and Safety Executive (HSE)

- HSE inspections
- Improvement Notices - References *311366376* and *312071248*

Since opening of the site, HSE inspectors have carried out regulatory interventions at the site. Two full site inspections have been carried out at the New Inn site since January 2021, which have resulted in follow up visits to check the progress and compliance of requested actions to be implemented.

The HSE have also investigated the deflagration incidents which have occurred since Autumn 2021. In February 2021, an Improvement Notice was served at the New Inn site relating to workplace transport. In November 2021, an Improvement Notice relating to management of health and safety was also served. This was served as a result of a visit to the Hengoed site, however this included management of health and safety across the company as a whole which included the New Inn site.

The HSE have stated that both Notices have been complied with and found no issues with the use of the shredder equipment.

7. Deflagration Incident - 6 July

- Operator immediate response and follow up
- Deflagration management going forward

Officer discussed the recent deflagration event and how the operator responded to and managed the incident. Usual pre-checks were conducted, however a canister was missed and fed through to the shredder. Discussed the frequency of recent events and the changes required to reduce the number through introducing pre-shredding equipment and thorough visual inspections at the observation points.

Spoke about the business making public statements to notify the community following an event, to explain the surrounding circumstances and raise awareness. However, an appropriate platform to do this in order to achieve beneficial results is subject to debate.

The operator continues to follow its working procedures and understands the importance of the pre-checking and segregation process to identify unsuitable materials. Discussions were had about increasing the pre-checks or slowing down the processing rate to increase the likelihood of spotting gas bottles.

8. Improving Procedures

It is evident that the principal act in reducing the risk of future events is to conduct strict pre-checking methods and thorough segregation. The operator is implementing appropriate pre-checking on site which has been successful in removing gas cylinders that would’ve otherwise caused a blast event. As mentioned, there is no mechanical means to ‘x-ray’ material to check for unwanted canisters, and so the waste checking process must be strictly actioned by staff.

Regular training will continue to be carried out to highlight the potential risks to staff members and reiterate the importance of the pre-checking process.

The Officer spoke about Best Available Techniques and the appropriate measures for emissions control at regulated industry facilities that mechanically treat metal waste in shredders. It is

evident that a pre-shredder would assist with the treatment process and is common measure that is implemented across the scrap industry. Given the various advantages to obtaining a pre-shredder - such as increased operational efficiencies, reduced downtime, protection of parts, quality throughput and lower cost per ton processed - the operator conveyed that this was a favourable option going forward and was agreeable to begin sourcing a machine for the site.

In the interim, a robust **Deflagration Management Plan** needs to be drawn up to compound the metal treatment procedures and processes and document the systems in place for reducing the risk of deflagrations.

ACTION

Submit timescales for the purchase and installation of pre-shredder equipment.

8. GENERAL SITE OBSERVATIONS

METAL RECYCLING

The operator continues to deposit metal around the shredder to create a dynamic barrier to assist with noise containment and absorption - the site map has been updated to reflect this. This should help prevent the noise propagating towards the direction of the site entrance. Officer raised the issue of prolonged storage of the waste metal used to create the bund. The Operator was reminded that there should be a turnover of this material and should not be a permanent fixture. It is recommended to document the turnover of this wall material to ensure this is managed effectively. For example, changing the base of the pile every four weeks.

Image – showing the stockpile of scrap metal deposited in the yard

In the shredding area, it was discussed to implement physical methods such as placing markers on the shredder/lampposts to indicate the 4m height-mark, so that staff have a visual cue to not stack metal above this. Discussed about the importance of adhering this height, again, for fire risk purposes and permit compliance.

There was bay filled with oversize scrap metal, that will be transported off site without further processing. There were no issues noted with fire risk or separation distances at the time of the inspection.

FINES MATERIALS

Metal fines are particles produced by a waste treatment process that involves an element of mechanical treatment. The EWC being used for any metal shredder material or shredder residue, should be leaving site as either:

- 191003* - fluff-light fraction and dust containing dangerous substance
- 191004 - fluff-light fraction and dust other than those mentioned on 19 10 03
- 191005* - other fraction containing dangerous substances
- 191006 - other than those mentioned on 19 10 05

Waste should not be leaving site coded under as a 19 12 __.

Although the different waste operations (i.e. ELV/transfer station activities) take place within the same yard, the business should be keeping an internal audit trail that documents all movements of wastes between the work areas. You must be able to demonstrate this on your waste return submissions.

TRANSFER STATION ACTIVITES

At the time of the inspection, all mixed municipal waste was stored under building canopy cover in-line with per conditions. The operator is continuing to manage the transfer station in accordance with its dust management plan. This activity is the most probable to generate dust issues, for which the site has water dampeners to address any excessive dust produced or weather conditions that could transport dust off the site boundary.

Image - showing mixed general waste stored under the canopy on appropriate infrastructure

The site has deposited clean material to act as bunding around the site and constructed fencing on top of the mounds to further prevent residual litter blowing off site.

On the last inspection, there were IBCs present containing empty paint cans with residual liquid in them - these were said to be non-hazardous, water-based emulsions. The paint pots on site are water-based paint tins, they are the same type as mentioned in previous visits. The EWC code used is 17 04 05 - light iron.

END-OF-LIFE VEHICLE DEPOLLUTION

There were no issues noted with the depollution bay and vehicle storage area. All work was being carried out within the designated shelter and the stacking/storage of shells was generally being managed well. Extracted hazardous elements such and oils and fuels were being appropriately stored ready for removal via an appropriate contractor. Appropriate stacking of ELVs was being executed.

Vehicle tyres are removed from vehicles, stored, and bulked up together before being taken to an appropriate contractor. It was noted that tyres were stored in three different loads within the work area - some requiring the alloys to be removed.

Image 1 – showing ELV depollution bay with tyre storage either side of the station

The drainage system was not thoroughly inspected on the inspection, however there were no signs or indication that there were any issues.

REPORTED AMENITY ISSUES

Since the last inspection, NRW have received multiple reported incidents with regard to amenity complaints for the S L site. The operator continues to be notified at the time of any reported incident, to then comment on the report details and provide further context or explanation as to its occurrence.

In July, NRW received reports alleging that the site was operating on a Sunday. CCTC footage of the site has been checked and demonstrated that the site was shut with closed gates for the duration of the day (when the report was logged) and so this report is unsubstantiated.

NOISE MITIGATION MEASURES
The operator has spoken of ideas to convert the metal shredder engine to an electric power, which would reduce some of the steady running noise being generated from diesel engine.

The Operator has purchased concrete wall stockades with the intention to create a barrier around the shredder. This is to absorb some of the noise and vibration wavelengths to lessen any excessive noise from leaving the site boundary. These have yet to be constructed due to the operator waiting for builder contractor availability to do the work. NRW requested the operator to provide details on timescales for completion - this has not been done.

ACTION
Provide NRW with timescales for erecting and encasing shredder with purchased stockades.

Active Monitoring
NRW Officers continue to conduct active monitoring of the site's activities to assess whether there are any impacts to the surrounding environment and to identify any root causes.

9. PERMIT COMPLIANCE

ACTIONS FROM PREVIOUS COMPLIANCE REPORTS

- Store mixed general waste within the transfer station building **- Compliant**
- Reduce all stockpiled waste exceeding four metres in height - **Compliant**

CATEGORY 2 BREACH - PERMIT CONDITION 1.1.1
(C2) - GENERAL MANAGEMENT - MANAGEMENT SYSTEM AND OPERATING PROCEDURES *"The operator shall manage and operate the activities: in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints."*
The operator's current rate of shredding, relative to the number of deflagration incidents that have occurred, is above the expected industry threshold. Whilst it is not a breach of the permit to have a deflagration, failure to identify and remove unwanted wastes from entering the shredder has resulted in multiple incidents occurring over the past twelve months that have caused environmental impacts to local areas. This demonstrates that the operator must implement additional measures to further reduce the risk of future deflagration events and decrease the frequency in which they are occurring. The current management systems do not appropriately address deflagrations and lacks

sufficient information on the control measures and operational activities.

In-line with industry guidance, the operator must: (i) produce a robust Deflagration Management Plan and (ii) investigate into sourcing pre-shredding equipment to reduce the frequency of incidents.

A **Category 2** breach has been scored against condition 1.1.1 to highlight this non-compliance.

10. AUDIT SUMMARY

This compliance audit has been useful exercise in identifying areas to improve the current metal treatment process. The evaluation has recognised areas that, once appropriate actions have been applied, should better the pre-treatment methods and emphasise the importance of segregation to detect unwanted materials. This is with the overarching aim to decrease the risk of deflagrations occurring within the shredder.

Whilst it is not a breach of permit conditions to have these deflagration events at a permitted waste facility, maximum efforts must be made across site activities to reduce the risk of these events from occurring. A breach occurs when the operator has failed to adhere to appropriate procedural measures (for example, not thoroughly carrying out visual input inspections), or a training issue has caused and contributed to the occurrence of a deflagration event.

It is understood that eradicating deflagration entirely at scrap treatment operations is extremely difficult. It has been acknowledged that the operator delegates a large amount of effort towards preventing explosions, as they result in reduced waste processing time (at best), or significant and costly damage to the shredder (at worst). It is evident that the operator conducts appropriate procedural measures to identify and remove unwanted wastes from stockpiles; this is demonstrated by the removal of multiple canisters from deposited material every month. However, due to the number of deflagrations relative to the rate of scrap processing, this exceeds the industry figures, which indicates that further mitigation measures need to be completed to reduce the frequency of these incidents.

Having assessed various compliance elements over the course of this audit, the operator needs to produce and submit a robust **Deflagration Management Plan** for review. This needs to be created as a priority which should include content on proper shredder operation, including a requirement to undertake waste pre-acceptance and acceptance checks to reduce the potential for compressed gas containers to be introduced into the shredder.

As recommended through BAT, improving the pre-treatment process by pre-shredding materials is a widely followed control measure in the metal shredding industry. Therefore, it is recommended for the operator to obtain **pre-shredding equipment** to assist with its treatment process.

Finally, the operator should carefully read the audit content with regard to industry guidance and BAT to digest and understand the information provided. It should strive to follow the recommended approaches to achieve higher compliance goals for processing metal. If followed and effectively implemented, these measures should improve the procedural focus and reduce the frequency of future deflagration events.

11. ACTIONS REQUIRED BY OPERATOR

No	ACTION DETAILS	DEADLINE
1	Create a Deflagration Management Plan that addresses the procedures that should be followed to reduce the risk of deflagration incidents. Submit to NRW for review.	**30 September 2022**
2	Submit timescales for the purchase and installation of pre-shredder equipment.	**2 September 2022**
3	Provide NRW with timescales for erecting and encasing shredder with purchased stockades.	**2 September 2022**
4	Continue to manage compliant storage levels and reasonable stockpile heights to safeguard against fire risk and visual pollution.	**Immediate**

If you have any issues with this audit report, please contact Officer Alex Bowder at Alex.Bowder@cyfoethnaturiolcymru.gov.uk

END OF DOCUMENT

Cyfoeth Naturiol Cymru
Natural Resources Wales